

THE SOCIAL, GEOGRAPHICAL, AND STRUCTURAL ENVIRONMENTS OF MINOR
NOBLE RESIDENCES IN ANGUS, 1449-1542

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Relying upon two common trends in modern castle studies, this exploratory study works to combine the landscape context and the spatial interaction of the main building to create an assessment of the spatial and social interaction between the main residential structure of a noble's estate and the landscape features attached to surrounding property features. To explore questions about this kind of interaction this project has taken the sheriffdom of Angus, Scotland, between the year 1450 and 1542, to examine non-royal residences in an area that offered a diverse topography. This project aims to gain a better understanding of the surroundings of late fifteenth and early sixteenth century noble residences in Angus while contributing to the growing discussion of castles and their landscapes, and testing methods for addressing the spatial and social interaction between the main structure and the landscape features. Section A discusses the three source types used for compiling the dataset for this project within the context of three key categories needed to create a GIS dataset: location, object, and attributes. From the landscape features the mills and fishings were the most commonly mentioned and further details regarding the contents of the lordly landscapes were rare.

Section B explores three methods of examining the relationships between the main residence and the landscape features: a modified RA and RRA values assessment, which measured levels of segregation within the noble residence site as a whole; a version of the gravity model, which helped identify the draw for interaction within the arrangement of the noble's landscape; and network analysis questions, which facilitated a clear assessment of any connections between the use of structural terms and landscape features mentioned over both temporal and social contexts. This exploration of spatial and social interaction opens up a discussion about Scottish noble landscape creation and new methods for studying the relationship between the main structure and the wider complex of a noble residence.

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'One can pay back the loan of gold, but one dies forever in debt to those who are kind.' ~Malayan Proverb

List of Abbreviations

ANT	Actor-Network Theory
DoE	Department of Environment
ESRI	Environmental Systems Research Institute
GIS	Geographical Information Systems
HER	Historical Environment Record
I_{\max}	Maximum Interaction
I_{\min}	Minimum Interaction
OASIS Scotland	Online Access to the Index of Archaeological Investigations
OSA	Old Statistical Account of Scotland
O.S.	Ordnance Survey
PPA	Proximal Point Analysis
PPG16	Planning Policy Guidance note 16
RA	Relative Asymmetry
RRA	Real Relative Asymmetry
RCAHMS Scotland	Royal Commission on Ancient and Historical Monuments of Scotland
RMS	Registrum Magni Sigilli Regum Scotorum
RI	Relative Interaction
SCAPE	Scottish Coastal Archaeology and the Problem of Erosion Trust
SNA	Social Network Theory

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Chapter 1: Introduction

This case study of Angus uses geographical, archaeological and documentary evidence to show how non-royal Scottish noble residences created a field for interaction within the broader landscape and provides a springboard for the discussion of built medieval landscapes within environmental history. Concentrating mainly around connecting the two common trends in Castle Studies to the spatial analysis of castellated structures and to further develop our understanding of the landscape in which these noble residences were situated. To this end, this thesis specifically participates in the greater themes of environmental history of interdisciplinary approaches towards understanding natural resource management.

In Edward J Cowan's 2012 *Why Scottish History Still Matters*, Richard Oram argues for the relevance of medieval history because of 'examples which it provides of the impacts of and responses to climate change and extreme weather events...'.¹ Oram's chapter emphasises mainly on the thirteenth century, the echoes of its traumas in the fourteenth and fifteenth centuries, and what these did to establish an identity within Scotland. This theme has been one of the main concentrations of Scottish and European medieval environmental history and has highlighted reactions to adversity and extreme conditions, all of which are very relevant to modern social conditions and behaviour.² Similarly, castle studies have stressed that the construction of castles

¹R. Oram, 'Away Was Sons of alle and Brede': Identity and Environment' in E.J. Cowan (ed.), *Why Scottish History Still Matters* (Edinburgh, 2012), p. 29.

² For further information see: B. M. S. Campbell, 'Nature as Historical Protagonist: Environment and Society in Pre-industrial England,' *The Economic History Review*, 63 (2010), pp. 281–314; T. P. Newfield, 'A Cattle Panzootic in Early Fourteenth Century Europe,' *Agricultural History Review*, 57 (2009), pp. 155–190; R. Oram and W. P. Adderley, 'Lordship and Environmental Change in Central Highland Scotland C.1300–c.1400,' *Journal of the North Atlantic*, 1 (2008), pp. 74–84; P. Slavin, 'Chicken Husbandry in Late-Medieval Eastern England: C. 1250–1400,' *Anthropozoologica*, 44 (2009), pp. 35–56.

and tower houses were representative of social developments³ and, subsequently, ‘reflected wider changes in medieval... aristocratic society’⁴ during the fifteen and sixteenth centuries caused by the pressures of previous physical and social environments. However, just as it is important to look at human reactions to extreme conditions,⁵ it is equally important to research daily human interaction with the immediate environment, which can be the result of these extreme stresses, whether climatic, social, or political.

This study is concerning small scale interaction: people’s interaction with others and the landscape on a daily practical basis rather than on a large scale national, political level. Nevertheless, it is important to keep in mind that between 1450 and 1542 there were several social changes that particularly effected nobles. Oram points out that the sudden increase of castle building by nobles in the fifteenth and sixteenth centuries was indicative of the stability of the time rather than the volatility, due to the resources needed for high levels of construction.⁶ However, there is an element of the noble families needing to establish their status and authority over the reigns of Kings James II to James V. James III and James V were minority kings, leaving many years for the increased importance of noble and local authority and giving rise to many new families reaching high status positions.⁷ Although this time period has many

³ C. Coulson, *Castles in Medieval Society: Fortresses in England, France, and Ireland in the Central Middle Ages* (Oxford, 2004); J. Kamphuis, ‘The Castle as a Symbol, the Image of Power,’ *Chateau Gaillard*, 24 (2010); C. McKean, ‘A Scottish Problem with Castles,’ *Historical Research*, 79 (2006), pp. 166–198.

⁴ R. Liddiard, *Castles in Context: Power, Symbolism and Landscape, 1066 to 1500* (Macclesfield, 2005), p. 59.

⁵ A. Oliver-Smith, *Anthropological Research on Hazards and Disasters*. (Emmitsburg, 1996).

⁶ R. Oram, *Angus and The Mearns: A Historical Guide* (Edinburgh, 1996), p. 109.

⁷ J. Brown, *Scottish Society in the Fifteenth Century* (London, 1977).

elements of stability, it was not free from tumultuous international relations. James III's marriage to Margaret of Denmark resulted in some settlement of the lands of Orkney and Shetland.⁸ He also signed a truce with England in 1463, but his relationship with the nobles was stressed, ending in his death at the Battle of Souchieburn against a large number of his nobles and his eldest son.⁹ James IV married Margaret Tudor in 1503, which led to a tentative peace between England and Scotland.¹⁰ However, the Scottish relationship with France was still friendly, straining the relationship with England and culminating in the Battle of Flodden in 1513, where the king and a significant number of nobles died.¹¹ After James V married the French Mary of Guise in 1538, his relations with England and his nobles was continuously strained. In 1542 he supplanted the mainstays of authority of Lords Gray and Glamis and the Earl of Crawford by granting lands to Thomas Erskine of Haltoun, though this was not long lasting.¹² Henry VIII brought an invading army north in the autumn of 1542, for the Battle of Solway Moss. He died of illness not long after.¹³ There was an increase of royal building during this time also,¹⁴ so it is not surprising that the noble community undertook similar projects to display their authority and power.

⁸ A. Hayes, 'Scottish Queenship, 1372-1528', (University of Aberdeen, current PhD thesis).

⁹ A Graham, 'The Battle of Sauchieburn', *The Scottish Historical Review*, 39 (1960), pp. 89-97.

¹⁰ L. H. Dean, 'Crowns, Weddings, and Processions: Continuity and Change in the Representations of Scottish Royal Authority in State Ceremony, c. 1214-c. 1603', (University of Stirling unpublished PhD thesis, 2013), p. 252.

¹¹ N. McDougall, *James IV* (Edinburgh, 1989).

¹² M. Lynch, *Scotland: A New History* (London, 1991), p. 164.

¹³ J. Cameron, *James V: The Personal Rule, 1528-1542* (East Lothian, 1998), p. 278.

¹⁴ J. Dunbar, *Scottish Royal Palaces: The Architecture of the Royal Residences During the Late Medieval and Early Renaissance Periods* (East Lothian, 1999).

The landscape surrounding fifteenth and sixteenth century noble residences is an excellent resource for studying human interaction with environments - structural, geographical, and social - in a defined space. Although royal structures are not addressed in this study, the project discusses a wide selection of high (nobility) and low status (serving staff) buildings that served a variety of purposes. This thesis looks at properties in the county of Angus, formerly known as Forfarshire. Angus is an ideal focus for this study because it includes almost the full range of medieval Scotland's geographical possibilities and resources, from high-mountain to coastal lands. Although this thesis does, admittedly, provide a study of space where noble families feature prominently, it does touch on elements concerning the broader range of social classes while discussing the noble household. This uniquely designed project uses these properties to address the lack of available large scale data pertaining to castle landscape features, as well as the need for further research approaches that incorporate both human and object interaction in spatial and network analysis, while striving to fill some of the historical gaps highlighted below. This thesis is organised into two sections. Section A looks at the three different types of sources used to compile the dataset of noble residences in late fifteenth and early sixteenth century Angus. Section B explores two methods of spatial analysis - RA and RRA values and the Gravity Model, to address any spatial relationships between the noble residence and the landscape features - and Network Analysis to address any temporal or social patterns in the use of attribute terms.

Making use of some methodical developments in the Humanities in a turn toward ‘place, space, and time,’¹⁵ this work involves a multidisciplinary approach that influences the methodology for creating a dataset, and the analysis of this material. Remaining historical in context and emphasis, this project draws on the values and current issues established in anthropology, archaeology, geography, and mathematics. Key themes from each of these disciplines were used to create a methodology that will contribute to the historical debate while adding to the growing application of Geographical Information Systems [hereafter referred to as GIS] and spatial and network analysis in the Humanities. These questions were developed specifically to emphasise the growing understanding of how noble residences featured as interactive points within a physical and social landscape and to expand the working knowledge of how spatial and network analysis can be applied to historical and archaeological questions. Many of the issues addressed here stem from the inherent challenges of assessing digitised material; other questions arise simply from gaps in the historiography and practical application of historical work.

The development of castle studies reflected shifts within European historical interpretation from the nineteenth century onwards. Its origins are grounded in a violent and socially distressed representation of the past. For Scotland, Patrick Fraser Tytler’s 1823 *History of Scotland*¹⁶ firmly established a long history of violent people, which the works of Sir Walter Scott further confirmed in the public’s perspective.¹⁷ Among other social contributions, popular architectural style shifted to

¹⁵ E. L. Ayers, ‘Turning Toward Place, Space, and Time,’ in David Bodenhamer (ed.) *The spatial humanities : GIS and the future of humanities scholarship*, (Bloomington, 2010), p. 1.

¹⁶ P. Tytler, *History of Scotland [1149-1603]* (Edinburgh, 1845).

¹⁷ See works such as: W. Scott, *Waverly Novels* (New York, 1880); and W. Scott, *The Fair Maid of Perth* (London, 1899).

incorporate pre-Renaissance features, developing a neo-Gothic and new Scots Baronial style. In order to ensure that they achieved authenticity of detail and a broad repertoire of designs, architects surveyed older structures. The most significant inspiration for Scotland's architecture was Robert Billings' four volumes on *The Baronial and Ecclesiastical Antiquities of Scotland*, a collection of drawings of what he considered the best examples of 'antique' architecture.¹⁸ It was not long before castellated structures were catalogued and ordered into a nineteenth century style typology. MacGibbon and Ross¹⁹ produced an immense amount of work, organising the castellated architecture into a four-part schema.²⁰ Influenced by the idealised violent past presented in the available histories at the time, MacGibbon and Ross interpreted every castellated structure from a militarised and defensive view. Until the historical context was reassessed in the mid-twentieth century, their four-part schema and interpretation remained as the main methodology that governing bodies like the Royal Commission on Ancient and Historical Monuments of Scotland [hereafter RCAHMS] and other scholars applied to largely archaeological and architectural based assessments.

In the 1960s, scholars such as G. W. S. Barrow and A. A. M. Duncan began to reassess the history of Scotland, revealing a rich culture that was engaged with the wider European social setting and no more violent than the rest of medieval

¹⁸ R. Billings, *The Baronial and Ecclesiastical Antiquities of Scotland* (Edinburgh, 1845).

¹⁹ D. MacGibbon and T. Ross, *The Castellated and Domestic Architecture of Scotland from the Twelfth to the Eighteenth Century*, (Edinburgh, 1887). Despite some creative license in their drawings, scholars of Scottish castle are greatly in Billings and MacGibbon and Ross' debt for preserving some form of architecture which no longer remains.

²⁰ First Period : 1200-1300 – similar to early English and French. Second Period: 1300-1400 – Tower constructions due to the Wars of Independence. Third Period: 1400-1542 – Courtyard plan castles. Fourth Period 1542-1700: Renaissance towers. See MacGibbon and Ross, vol I p. xii -xiii, vol II p. 2.

Europe.²¹ By and large, however, major castle scholars such as Stewart Cruden took little of this new research into account. Still, it was becoming more evident that looking at castles as purely military entities failed to address other significant qualities. Cruden's work does not do much to break with the MacGibbon and Ross traditions, but he does note that, 'if castles are pre-eminently regarded as the result of progressive developments in military science they will receive less than a just appreciation, for they are noble works of architects and masons...'.²² An appreciation of the larger social situation of castle construction in Scotland had been developing since the 1920s, stemming from William MacKay Mackenzie²³ and W. Douglas Simpson.²⁴ Most of Simpson's work was still embedded with structural details, but papers published in the 1940s point to castles as social and economic centres. Evidence revealed by researchers strongly suggested that visible ruins were only one part of a series of structures and features that made up a noble residence. These revelations were demonstrated by the excavations, revealing a complex series of outer buildings, directed by George Good and Christopher Tabraham at Threave.²⁵ Other investigations clearly question the validity of MacGibbon and Ross's schema, as certain structures suggested to be early medieval are clearly late and vice-versa.²⁶ These findings have caused a focus on the function of castles within modern

²¹ G Barrow, *Robert Bruce and the Community of the Realm of Scotland* (Berkeley, 1965); A. A. M Duncan, *Scotland: The Making of the Kingdom* (Edinburgh, 1975).

²² S. Cruden, *The Scottish Castle* (Edinburgh, 1960), p. 101.

²³ W Mackenzie, *The Mediaeval Castle in Scotland by W. Mackay Mackenzie .with Sixty-nine Illustrations and Nineteen Plans* (London, 1927).

²⁴ W. D. Simpson, *The Architectural History of Huntly Castle*, 1922; W. D. Simpson, *Scottish Castles: An Introduction to the Castles of Scotland* (Edinburgh, 1959).

²⁵ G. L. Good and C. J. Tabraham, 'Excavations at Threave Castle, Galloway, 1974-78', *Medieval Archaeology: Journal of the Society for Medieval Archaeology*, 25 (1981), pp. 90-140.

²⁶ For a more detailed discussion of this shift see: R Oram, 'Castles, Concepts and Contexts: Caslte Studies in Scotland in Retrospect and Prospect,' *Chateau Gaillard*, 23 (2008), pp. 349-359.

assessments, particularly in relation to internal arrangement, through spatial analysis and landscape contexts.

As new developments in castle studies were driven by the new focus on the function of structures, archaeological and architectural studies increasingly queried spatial issues through a new concentration on function. Taylor, in 1948, emphasised the need to look at the spatial relationship between identified features across a varied dataset, including ecological and archaeological data.²⁷ Clark, in 1954, began looking at patterns in settlement and artefact distribution to explain how society functioned.²⁸ Later studies concentrated on connections that could be drawn across borders and between cultures.

Architecture remained at the centre of these developments in spatial analysis. In the late twentieth century, a shift in archaeological spatial analysis moved to address less tangible qualities of social function, such as ideas of power, and researchers attempted to establish an origin for the spatial distribution. Studies looked at the spatial relationships based on an innate human need to establish claim to a territory. Others looked at environmental factors as the sole influence in structural setting. Another approach looked at the exterior of structures as a form of symbolism for society and underlying power. Hillier and Hanson aimed to set a methodology which was not so much centred on the origin of the structural arrangement but on how the spatial arrangement either limited or encouraged social interaction. They did this by focusing on opened and closed spaces, the distribution of these points, and the axial

²⁷ W.W. Taylor, *A Study of Archeology*, (Menasha, 1948).

²⁸ J. G. D. Clark, *Excavations at Starr Carr*. (Cambridge, 1954).

links between them. One of their most significant contributions involved developing access analysis – a method for measuring how integrated or segregated a system of rooms is by finding and assessing these Relative Asymmetry [here after RA] values.²⁹

In castle studies, spatial analysis began with Faulkner's investigations into domestic planning. In 1958, he developed a typology for features and provisions within domestic space and,³⁰ in 1963, brought these features into a planning diagram in order to address what he called a 'conflict between its [the castle's] military and domestic functions.'³¹ The type of diagram that he used allowed him to clearly see how the structures were divided into households with separate halls. There was a further division of the structure into a rare 'full use' when the lord was present and full time 'limited use' for administration. In 1992, spatial analysis merged with castle studies when Fairclough combined Faulkner's planning diagram with Hillier and Hanson's access analysis. In Fairclough's study of Edlingham Castle, he specifically addressed the forms and functions. Through this application he was able to identify spaces of control, particularly highlighting that access to the roof was often only gained, and thus controlled by, high status apartments.³²

²⁹ B. Hillier and J. Hanson, *The Social Logic of Space* (London, 1993).

³⁰ P. A. Faulkner, 'Domestic Planning from the Twelfth to the Fourteenth Centuries,' *Archaeological Journal*, 115 (1958), pp.150–183.

³¹ P.A. Faulkner, 'Castle Planning in the Fourteenth Century,' *Archaeological Journal*, 120 (1963), pp. 215–235.

³² G. Fairclough, 'Meaningful Constructions – Spatial and Functional Analysis of Medieval Buildings,' *Antiquity*, 66 (1992), pp. 348-366.

Mathieu, in 1999, expanded the applied methodology by taking a three-stage approach to determine the percentage of domestic versus defensive space; he first used a feature analysis to determine the room's function, then used a combination of planning and access analysis to determine the organisation of the rooms and, finally, he compared the amount of domestic and defensive space. It was evident that the domestic space exceeded the defensive.³³ Fairclough's combination of planning analysis and access analysis carried over into studies of Irish castles.

Sherlock has used Fairclough's approach to demonstrate the depth of castles, explaining that a higher depth value would create a more 'confused' and 'uncertain' experience for the guest.³⁴ Sherlock's study revealed a distinct difference between pre-1500 and post-1500 structures, in that the latter had more private space. The concept of private space was explored further by Eadie who determined that the lack of division in the structure meant they were either fully private or fully public spaces.³⁵ The only spatial analysis work on Scottish castles that has been completed as of the present date was Allan Rutherford's unpublished PhD thesis of 1998 which used access analysis to demonstrate the emphasis on social status rather than military defence.³⁶ The attention of most of this previous spatial analysis of castles has been on how people look at the internal space, despite the significant trend in castle studies to assess castles within their landscape context. Fairclough hints at some

³³ J. R. Mathieu, 'New Methods on Old Castles: Generating New Ways of Seeing: Generating New Ways of Seeing,' *Medieval archaeology: Journal of the Society for Medieval Archaeology* (1999), pp. 115–142.

³⁴ R. Sherlock, 'Changing Perceptions: Spatial Analysis and the Study of the Irish Tower House,' *Chateau Gaillard*, 23 (2008), pp. 239–250.

³⁵ G. Eadie, 'Detecting Privacy and Private Space in the Irish Tower House,' *Chateau Gaillard*, 24 (2010), pp. 69–75.

³⁶ A. G. Rutherford, 'A Social Interpretation of the Castle in Scotland' (University of Glasgow, 1998), unpublished thesis.

interaction with the external features of the castle when addressing access to roofs for views, but no further attempts to address the spatial connections of the main castle structure with the landscape features has been made.

Although landscape features have always been of interest to historians and archaeologists studying the land around noble residence, particularly since the 1950s, scholarship looking at all features of a noble landscape together as a unit inseparable from the main structure has occurred only recently. The earliest examples, such as Ella Armitage in the early twentieth century, are unique with their assessment of landscape.³⁷ Settlement, churches, and monasteries have been addressed in relation to their landscapes, but noble residences have only been in the background of these and other landscape studies. It was not until castle studies shifted toward a more social and functional theme that a study of the landscapes associated with it was possible. In 2002, Oliver Creighton published his work *Castles and Landscapes: Power, Community and Fortification in Medieval England*, which analysed the landscape features situated around castles as a unit. His study looks at the context from which the study of castle landscapes has grown, how landscape features function with the structure from military, symbolic, and administrative perspectives, and how the castle affects the development of its surroundings, both structurally and environmentally. He highlights many avenues for future research, particularly the need for cross-disciplinary study of the material and a need to continue to categorise

³⁷ E. Armitage, *Early Norman Castles of the British Isles* (London, 1912).

all the features within the sites, with specific reference to the creation of a GIS dataset, enabling the easy creation and visualization of material.³⁸

The assessment of castle landscapes has grown in popularity since Creighton's work, establishing a string of core texts on the subject. Johnson's text also addresses the immediate landscape of the castle from its social situation.³⁹ Another key analysis includes Liddiard's *Castles in Context: Power, Symbolism and Landscape, 1066 to 1500*, which looks at the castle and its surroundings from a context of function and form.⁴⁰ Hansson has also looked at the features in relation to social practices, expanding the history to include cross-cultural comparison.⁴¹

Recent postgraduate studies have further enriched dialogue about castle landscapes. Inspired by another of Creighton's studies on castle landscapes as they were viewed from the castle in 'A Room with a View,'⁴² Kare McManama-Kearin has taken an approach that incorporates the inventorying of castle features in Ireland and using a GIS to assess their visibility from the castle through view-shed analysis. Her study reveals that few of the castles assessed were situated in a militarily beneficial way, and that priority was given to access to water (not necessarily internal access) and

³⁸ O. H. Creighton, *Castles and Landscapes: Power, Community and Fortification in Medieval England* (London, 2002).

³⁹ M Johnson, *Behind the Castle Gate: From Medieval to Renaissance* (London, 2002).

⁴⁰ R. Liddiard, *Castles in Context: Power, Symbolism and Landscape, 1066 to 1500* (Macclesfield, 2005).

⁴¹ M. Hansson, *Aristocratic Landscape: the Spatial Ideology of the Medieval Aristocracy* (Stockholm, 2006).

⁴² O. H. Creighton, 'Room with a View: Framing Castle Landscapes,' *Chateau Gaillard*, 24 (2010), pp. 37–49.

crossroads or routes, of which at least one could be monitored from the gatehouse.⁴³ This attention on water stresses the necessity of looking at the function of these structures and landscapes as multi-use sites, where each purpose is not necessarily mutually exclusive. Rachel Swallow's work on Aldford Castle underlines this combined purpose as well as the transformation of use with each lord occupying the site.⁴⁴ This highlights that connections between the individual elements of the site should always be studied within the context of the daily, multipurpose function of the castle. Aside from McManama-Kearin's study, current trends in the study of castle landscapes look closely at specific sites and working with smaller datasets. These studies will certainly increase understanding of castle sites, but a large-scale catalogue of castle site features is lacking for any place outside Ireland.

Developed by both geographers and economists, the gravity model has been a key method for assessing the interaction between places. The gravity model directly focuses on the bond between two places created through social interaction. The gravity model is a modification of Newton's law of gravity, which stipulates that gravitational force is directly proportional to the combined mass of the objects and inversely proportional to the distance between them. It was amended to assess the draw of interaction between two population sizes and provides the maximum possible one-to-one relationship between the two populations being addressed, considering the distance.⁴⁵ The model was later developed to assess more complex

⁴³ K. McManama-Kearin, 'The Use of GIS in Determining the Role of Visibility in the Siting of Early Anglo-Norman Stone Castles in Ireland' (Queen's University Belfast, 2012) unpublished thesis.

⁴⁴ R. Swallow, 'Landscape of Power: Aldford Castle, Cheshire,' *Cheshire History Journal*, 52, (13), pp. 5–28.

⁴⁵ G. A. Johnson, 'Aspects of Regional Analysis in Archaeology', *Annual Review of Anthropology*, 6, (1977), p. 482.

situations, including geographic, linguistic, ethnic, and legal relationships.⁴⁶ Nevertheless, the most important development for this project was Jochim's adjustment in 1976 of the formula to assess the relationship between a population and a resource site.⁴⁷

Network analysis, as with spatial analysis, has grown in popularity with the rise of computerisation and the subsequent mathematical application for assessment. In most cases, network analysis has taken the form of Graph Theory, which originated in Leonhard Euler's paper on the Seven Bridges of Königsberg in 1736.⁴⁸ Graph Theory is both useful for its node-link diagrams and adjacency matrices. Network theories have grown out of sociological and anthropological analysis and have brought about two main types of theory: Actor-Network Theory (ANT) and Social Network Analysis (SNA). Both of these systems have been incorporated into archaeological studies, mainly from the 1960s onwards. Early uses demonstrated the vast amount of sub-divisions in SNA but also limited the use of SNA by having used the representative graphs for visual aids and not for extensive analysis and use with small datasets. For example, Hiorn's assessment of the connections of parishes in Oxfordshire is visually represented by graphs, but not mathematically assessed.⁴⁹ The common idea that Graph Theory was to be applied in this way to archaeological

⁴⁶ J. J. Lewer and H. Van den Berg, 'A Gravity Model of Immigration', *Economics Letter*, 99 (2008), p. 164; J. Melitz, 'North, South and Distance in the Gravity Model', *European Economic Review*, 51 (2007), pp. 971-991; R. Rivers, C. Knappett, and T. Evans, 'Modelling Maritime Interaction in the Aegean Bronze Age', *Antiquity*, 82 (2008), p. 8.

⁴⁷ M.A. Jochim, *Hunter-gatherer Subsistence and Settlement : A Predictive Model* (New York, 1976), pp. 56-58.

⁴⁸ A.L. Barabási, *Linked: The New Science of Networks* (Basic Books, 2002), p. 9.

⁴⁹ P. Hodson, F. R., Kendall, D. G., Tautu, *Mathematics in the Archaeological and Historical Sciences: Proceedings of the Anglo-Romanian Conference, Mamaia, 1970* (Edinburgh, 1971); R. W. Hiorns, *Demographic Patterns in Developed Societies* (London, 1980).

space was exemplified by Doran and Hodson's assessment of *Mathematics and Computers in Archaeology* which limits the discussion of graphs as a visual tool.⁵⁰ The subdivisions slowly developed the assessment side of network analysis. Terrell, in 1976, developed a Proximal Point Analysis (PPA) system to look at interaction with a geographical influence.⁵¹ Another new type of analysis is Network Centrality, which can be divided into degree centrality, closeness centrality, betweenness centrality, and eigenvector centrality. Although most of these have been further established by a modern surge of interest in Network Analysis, a study in 1987 by Rihill and Wilson⁵² laid the groundwork for the modern approach by establishing ego networks, link multiplexity, and topographical zones.⁵³

Where most of SNA looks at humans and their interactions, ANT looks at both humans and objects. Both forms of Network Analysis are greatly restricted by the limited nodes of interaction; however, modern types of Network Analysis look toward creating a dynamic model that combines certain elements of both ANT and SNA and incorporating some complex Network Assessment including scale-free models. This move to dynamic models allows research questions using network analysis to not only expand their datasets into more multifaceted forms of interaction but also look at more 'real world' situations with networks that have no clear central control point. Researchers have developed significant projects in this area;

⁵⁰ J. E. Doran, *Mathematics and Computers in Archaeology* (Cambridge, 1975).

⁵¹ J. E. Terrell, 'Island Biogeography and Man in Melansia,' *Archaeology and Physical Anthropology in Oceania*, 11 (1976), pp. 1–17.

⁵² A. G. Rihill, T. E. , Wilson, 'Spatial Interaction and Structural Models in Historical Analysis: Some Possibilities and an Example,' *Histoire and Mesure*, 2 (1987), p. 5–32.

⁵³ For a more detailed discussion see: T. Brughmans, 'Thinking Through Networks: A Review of Formal Network Methods in Archaeology,' *Journal of Archaeological Method and Theory*, 20 (2013), pp. 623–662.

particularly notable studies include the collaborative work of physicists Tim Evans and Ray River and archaeologist Carl Knappett.⁵⁴ Through this process, they have been able to establish a clear methodology that examines the social interactions between islands. Knappett also concentrates on ‘the role of material culture in human interaction’ over: micro-, meso-, and macro- scales.⁵⁵ These scales have been picked up by many scholars as they continue to develop a new way to assess interaction in regard to sites, settlements, and material culture. One example of this application is the collection *Network Analysis in Archaeology: New Approaches to Regional Interaction*.⁵⁶ Such studies highlight a continued need for an assessment of human interaction with material culture, both in terms of content and methodology.

This study has been designed to address the lack of discussion surrounding interaction between noble residences and their landscape features within castle studies in general, and more specifically the Scottish context. However, prior to addressing possible interactive relationships between the main residential feature and the associated landscape attributes, it was necessary to more fully understand the physical presence of the noble residences along with what features existed within the demesne property rights. In order to create a dataset that was centred specifically around the noble residences of Angus in the late fifteenth and early sixteenth century and the landscape features that were attached to the property, three main types of sources (geographical, archaeological, and documentary), were used to compile this

⁵⁴ R Rivers C Knappett, T Evans, ‘Modelling Maritime Interaction in the Aegean Bronze Age,’ *Antiquity*, 82 (2008), pp. 1009–1024; R Rivers C Knappett, T Evans, ‘The Theran Eruption and Minoan Palatial Collapse: New Interpretations Gained from Modelling the Maritime Network,’ *Antiquity*, 85 (2011), pp. 1008–1023.

⁵⁵ C. Knappett, *An Archaeology of Interaction: Network Perspectives on Material Culture and Society* (Oxford, 2011).

⁵⁶ C. Knappett, *Network Analysis in Archaeology: New Approaches to Regional Interaction* (Oxford, 2013).

information. One of the aims of this study was to place as much of this data as possible into a GIS compatible format to further facilitate spatial analysis. Therefore, Section A (Chapters Two, Three, and Four) discusses the three types of source material within the context of the three fundamental categories of a GIS dataset, location, object, and attributes.

Chapter Two concentrates on the category of information most commonly associated with a GIS database (location) through the source type in which location is most easily accessed (geographical). The geographical sources used to identify the location of features for this project vary significantly in type and the way in which they have been incorporated into the dataset. Very little information about noble residences in Angus was available in geographical sources prior to the late sixteenth century, when Timothy Pont drew up his chorographic representations of Scotland. What little was available related more to identifying places significant to travel and trade than providing specific details of the noble residences' surrounding landscape. However, Pont's detailed, though physically skewed, representations of Angus provide an incredibly unique and valuable resource for situating the noble residences within certain topographical elements of the landscape along with key representational and productive features of the immediate surroundings. From the late sixteenth century onward, geographical portrayal became more and more physically accurate and detailed, helping scholars identify if the location of many of these noble residences and their corresponding landscape features in a modern coordinate system. When considering the identification of place, these sources have provided a unique representation of the contemporary ideas of location as well as transforming these ideas into a modern framework of coordinates and scale.

Chapter Three considers the object ID category of information relating to a GIS dataset through the consideration of archaeological evidence. As the object ID directly corresponds to the physical presence of a point in question, the material remains that are addressed by archaeological evidence are particularly useful in this discussion. Unfortunately, specific late fifteen and early sixteenth century physical remains for many of the noble residences in Angus are either no longer present or extremely limited, leaving only the site of a former structure. Because of the lack of remains, the core archaeological evidence for this dataset has come from late nineteenth century architectural surveys from MacGibbon and Ross.⁵⁷ This evidence, however, has proved beneficial in as much as it has provided information about some buildings that have since been renovated or become inaccessible. The majority of the excavation reports used for this study were undertaken in the early twentieth century by Simpson. The survival of archaeological information was crucial in using sites for the spatial analysis explorations found in Chapters Five and Six.

Chapter Four addresses the GIS dataset category of attributes through a discussion of documentary evidence. Although the geographical and archaeological sources provide some information on the sites, it is through the surviving documents that the noble residences are identified with various structural terms and the resources (or at least rights to the resources) attached to the property. The most significant documentary type for this project has been surviving charters, though those which include extensive lists of attribute features contained within an estate are limited. Nevertheless, through these documents, two different types of attributes can be identified. First, there is a varied list of terms associated with the identification of the

⁵⁷ D. MacGibbon and T. Ross, *The Castellated and Domestic Architecture of Scotland from the Twelfth to the Eighteenth Century* (Edinburgh, 1887).

noble residence itself, including the following: castle, tower, fortalice, manor-house, and mansion. Second, there are attributes relating to the economic production of the estate, the most common of which are the rights to fishings and mills, and the less frequently mentioned parks, woodland, forest, gardens, and orchards, etc. It is through these attributes that the make-up of the physical presence of the demesne of the noble residences in question can be identified and the spatial relationship between these attributes can be assessed.

These three sources types (geographical, archaeological and documentary) have been used to create a catalogue of information relating to the noble residences of late fifteenth and early sixteenth century Angus and their landscape attributes, which is represented in Appendix A. The primary purpose of compiling this data was to further expand and complicate current understandings of the composition of the landscape of medieval Scottish noble residences and landscapes, which has been done. The location, object ID, and attributes have all been used to create representations of the main building and the attribute features in GIS, specifically for the analysis of Chapter Five.

The second phase of this project (Section B) has been to explore methods in spatial and network analysis to expand on the understanding of the interactive relationships between the main residential structure and the other features attached to the demesne lands. Chapters Five and Six are directly related to spatial analysis but were limited to including sites with enough archaeological evidence for such analysis. In order to include the wider range of information established in Section A, Chapter Seven explores the benefits of using network analysis to address the possible physical,

temporal and social links between the structural terms and feature attributes identified through the documents discussed in Chapter Four.

Chapter Five specifically takes the commonly accepted RA (Relative Asymmetry) and RRA (Real Relative Asymmetry) value assessment for evaluating the internal space of a noble residence and explores a method for using this technique to assess the external arrangement of the landscape. To explore this method, this assessment conformed to many limitations. First, the physical location of the noble residence had to be known. Secondly, the identified landscape attributes also needed to be located within the landscape. Therefore, the RA and RRA value assessment for this study was calculated by considering the parameters of the main residence, mills, and fishings. The mills and the fishings were the features within the noble landscape where the location was most solidly identified, which seems consistent with McManama-Kearin's identification of the access to water being a primary consideration. Despite these limitations, this exploration of employing RA and RRA values provides unique insights into how the arrangement of these late fifteenth and early sixteenth century sites dictated open or restricted interaction within their boundaries, and how this model can be further applied to historical datasets.

Chapter Six expands the findings of the RA and RRA values to address the natural pull between the main residence and a feature of production⁵⁸ through and exploration of the gravity model. The mill was the feature of production used for this model, due to the relative ease of identifying its location and a fair estimate of

⁵⁸ A named attribute within the landscape that produces a resource, such as milled grain or fish.

production of grain. In order to use this model, the population for the site had to be estimated. Eadie's model was used to identify the maximum household during a feast. However, as Fairclough pointed out, there was a difference in the household size depending on when the lord was present and when he was away, so a minimum was also identified as ten members of staff. These populations were used to calculate the draw for interaction between the main residence and the mill shown through the I_{\min} (Minimum Interaction) and I_{\max} (Maximum Interaction). In order to compare the sites to each other, the RI (Relative Interaction) was determined, revealing a ranking of sites on the standard ease of interaction between the mill and main residence. Not only has this method expanded the discussion on how to use the gravity model within a historical context, but it has also identified some noble residences with extremely strong and weak natural draws for interaction.

Chapter Seven addresses the limitations of Chapters Five and Six, particularly their reliance on the identifiable physical location of the main residence and the attribute features by assessing the dataset through a series of questions relating to network graphs. These graphs have allowed this study to identify any obvious patterns between how the sites were represented over time and if there were any specific connections between the structural terms used and the attribute features named. Furthermore, these graphs allowed for this data to be placed within the social context of the noble residences, testing if there were distinct patterns relating to certain structural terms or attribute features identified and specific families. The application of this method in Chapter Seven suggests that broadening the parameters to include all of Scotland within this time period will bring several distinctive patterns to light.

Overall, this thesis has been designed to fulfil two purposes: to build up the understanding of the late fifteenth and early sixteenth century Scottish noble residence and the surrounding landscape (Section A). It also explores avenues for assessing interaction between the noble residence and the attributes in the landscape; thus expanding the discussion of how medieval noble residences accommodated interaction and how RA and RRA values, the gravity model, and network analysis can be applied to historical contexts (Section B). Both of these purposes add unique findings to contribute to the further discussion of these topics and the further exploration of the application of these methods to other studies.

Chapter 2: Establishing Location through Geographical Sources

A.2.1: Location

The definition of the surrounding environment used for this study was crafted based on a variety of sources. It can be categorised according to the spatial qualities: location, object, and attributes, which cumulatively contribute to a cohesive understanding of place. This project divides and examines each spatial quality within geographical, archaeological and documentary sources.

Based on the analysis of the geographical source materials, two major themes are identifiable as significant features demanding further study. First, early geographic sources reveal different human efforts to conceptualise the land through highlighting landscape features as well as anthropogenic developments that were potentially valuable for other individuals, traders, or governments. Early geographic sources for the sheriffdom of Angus identified key places for travel and economic development. The choice of these elements reflected the mind-set of the time, which prioritised displaying a sense of location and place focused on travel and trade. Second, the geographical sources help identify the location of features where data on the precise location of a feature was obscured. When combined with the documentary evidence discussed in Chapter Four, these sources and late modern maps can be used to identify the location of features not noted in the early modern drawings, furthering the definition of location within the late fifteenth and early sixteenth century context of Angus and reinforcing the physical understanding of place and space used to exemplify a specific area. The origins of preserving previous understandings of the

topography originated in the development of chorographical and geographical studies and have continued to evolve, as archaeological and historical investigations required a thorough appreciation of landscape setting in order to answer the questions raised by the study.¹

Of the three characteristics of spatial data, location is the most essential feature for establishing a spatial relationship. ESRI's GIS dictionary defines it as 'a position defined by a coordinate value'² and it is the foundational concept of any spatial analysis.³ Location incorporates elements of space and place, but differs in its specificity. Space is inter-specific, being a general identification of the parameters of a specific area. Place is a functional understanding of an area gained through experience or association.⁴ Location is a specific identifier but is entirely subject to the associated system of spatial reference, whether relative, like identifying a place as five miles from the mountain, or absolute, like the modern expressions of a coordinate system.⁵ Therefore, historical map sources, typically drawn with a relative referencing system must be translated to the absolute references of modern coordinate systems in order to spatially assess distances and relationships between objects in the identified space. This translation process also reveals some of the original ideas of space and

¹ S. Rippon, 'Historic Landscape Characterisation: Its Role in Contemporary British Archaeology and Landscape History', *Landscapes*, 8 (2007)p. 3.

² ESRI, *Location*, <http://support.esri.com/en/knowledgebase/GISDictionary/term/location>, [accessed 16 April, 2013].

³ M. N. DeMers, *Fundamentals of Geographic Information Systems* (New York, 1997), p. 32.

⁴ Y.F. Tuan, *Space and Place : The Perspective of Experience* (Minneapolis, 1977), p. 71.

⁵ M. N. DeMers, *Fundamentals of Geographic Information Systems* (New York, 1997) pp. 32-34.

location used to draw the maps, as well as the extent to which the older maps are relative and useful to each other and this project.

A.2.2: Location Illustrated through Geography

The first step in identifying the contents of the space involves defining the location. This concept is best illustrated through a discussion of geographical sources, both historical and present-day. In this study location is understood as the specific identification of a feature within a topographic context. It is different from space and place, as discussed above, and is used in this discussion as the platform by which a historical spatial awareness can be converted into modern perceptions of space and location. Essentially, the primary purpose of this process is quite basic: identify the location of each known site and define features within the modern coordinate systems. In this way, each site and feature can be situated within a context that allows the spatial relationships to be understood.

A.2.2.1: About the Sources

Most early geographic knowledge has not been developed from cartographic sources but by chorographic sources, typically defined as ‘writing about [or a representation of] a country or region,’ including both textual and pictographic documents.⁶ These

⁶ D.J. Rohl, ‘The Chorographic Tradition and Seventeenth- and Eighteenth-century Scottish Antiquaries’, *Journal of Art Historiography*, 5 (2011), p. 1.

early sources, a mixture of texts and pictographic descriptions, were mainly developed under the purview of providing information about travel and trade. Textual sources were often concerned with the physical nature of the land in relation to both terrestrial and aquatic travel and how these areas came to be part of the understanding of the boundaries of a nation,⁷ whereas the pictographic sources focused on placement of major settlements along travel routes. Although limited localised knowledge of Angus can be identified from these sources, they provide a basic framework of the common travel routes. When the main travel routes are compared to the location of the sites of the local noble residences, it is possible to identify the estates that would have been more connected to the wider world and those restricted to a more localised context.

A.2.2.2: The Development of Chorography in Britain

Chorographical sources are often linked to projects seeking to better understand the nation and are therefore often viewed as a ‘topographical-historical genre’.⁸ Chorography in the British Isles was linked to a need for a better understanding of Britain, particularly in relation to its historical background, which gives many of the sources a flavour of antiquarianism. Demand for such sources came from several social, economic, and political developments, including administrators’ needs for a better understanding of the land and its boundaries, increased interaction and trade within the countries of the British Isles, and the broadening of the scale on which nations needed to present themselves internationally as the known world expanded with the discovery of the North and South American continents. Crises in England,

⁷ W. Rockett, ‘Historical Topography and British History in Camden’s *Britannia*’, *Renaissance and Reformation*, 26 (2009), p. 75.

⁸ S. Mendyk, ‘Scottish Regional Natural Historians and the Britannia Project’, *Scottish Geographical Magazine*, 101 (1985), p. 459.

arising domestically from rebellions and internationally through relations with France and Spain in the mid-16th century, encouraged the English government to expand the known information about the geography of its land. The government strengthened and built fortifications across the country as a result of this conflict, causing many maps and estate plans to be drawn.⁹ Although cartographic use and development continued to be employed and patronised by the wealthy, a need developed to understand the history of certain places and how they became a part of their current country. Perhaps more importantly, there was an increase in need to understand how boundaries were situated and their history of ownership.¹⁰ In this way, the administration could understand the limits and resources that were available. Depicting the island of Great Britain as a whole, perhaps in anticipation or expectation of the 1603 union but also as purely an understanding of what is a clear, geographically physical entity, became a priority. This display of unity of the entire island was also connected to the sudden increase in the world scale in which the nations were presenting themselves. Therefore, an understanding of a country's history and topography became important within the context of exploration.¹¹ Those whose projects are recognized today as contributing to the knowledge of places, land-use and geographic development are John Leland (1506-1552), William Lambarde (1536-1601), and William Camden (1586).¹²

⁹ P. Barber, 'England II: Monarchs, Ministers, and Maps 1550-1625' in D. Buisseret (ed.) *Monarchs, Ministers and Maps: The Emergence of Cartography as a Tool of Government in Early Modern Europe* (Chicago, 1992), p. 57.

¹⁰ Ibid.

¹¹ M. N. Pearson, *Merchants and Rulers in Gujarat: The Response to the Portuguese in the Sixteenth Century* (Berkeley, 1976), p. 16.

¹² For more information about the development of chorography in Britain see: S. Mendyk, 'Early British Chorography', *The Sixteenth Century Journal*, (1986), pp. 459-481 and M. Gillings, 'Chorography, Phenomenology and the Antiquarian Tradition', *Cambridge Archaeological Journal*, 21 (2011), pp. 53-63.

A.2.2.3: Travel Agenda

The agendas of the earliest maps of Scotland largely revolved around travel and, subsequently, trade. The majority of features identified in these early maps were coastal or accessible by water. This emphasis seems to indicate a focus on the ports and major centres of trade. Given that most of these maps were drawn by people not native to Scotland, this focus is not surprising. However, they unquestionably portray a skewed view of Scotland. Ditchburn points out that most of the port developments likely ‘owed their origin less to maritime access than to the convergence of land routes on estuarine fording points,’ since the fundamental Scottish economy was focused on rural development.¹³ It was not until the late sixteenth century that specific details about the developments in rural Scotland were indicated on chorographic material. Nevertheless, it is important to consider the concepts of space and location displayed by these early maps in order to further understand the nature of how these concepts were presented in the later transitional sources.

Chorographic representation of Scotland provides data and clues for this analysis of perceptions of topographic and anthropogenic landscapes and how these were portrayed and highlighted for their audience. Most of the chorographic traditions in the British Isles developed from England, so it is not surprising that the first attempts to describe the features of Scotland (particularly in Angus) were written from an English military perspective. These descriptions, primarily Edward I’s itinerary from 1296 and the Chronicle of John Hardyng from c. 1460, provide key information

¹³ D. Ditchburn, ‘Maritime Ports and Transport, c 1200-1560’, in K. Veitch, *Scottish Life and Society: A Compendium of Scottish Ethnology. Volume 8* (Edinburgh, 2009), pp. 23, 43.

regarding important settlements in the area and the most apparent topographical features. Each of these descriptions provided a distinct understanding of what was necessary and required for foreign interaction with the area. Although these sources were not intended for an audience beyond England, it is important to place these details on a scale of what was sufficient for the neighbouring country and what became information for a European audience.¹⁴

Concepts of distance changed noticeably after the standard mode of travelling large distances developed into a mechanised state, allowing for greater distances to be travelled in a day. The maps chosen for this project, however, mostly used the basic achievable distance limited by foot (a maximum of twenty miles a day)¹⁵ or horse-travel (a maximum of thirty to thirty-five miles a day).¹⁶ There are some, such as Nicolay's map, that were clearly focused on water travel, indicating only places that could be reached by sailing the ocean or along major rivers. The idea of travelable distance was an important attribute for the cartographer to keep in mind, noting places that were within a day's walk or ride of the previously marked place. Paris' and Gough's maps are both itineraries in nature and follow this rule.¹⁷ From the northernmost point in Scotland (Aberdeen on both maps) the named places follow regular intervals. Paris used a horse-ride's distance and Gough a foot traveller's distance. The distances of these routes were directly linked to the appropriate passages.

¹⁴ J. Hardyng, H. Ellis, and R. Grafton, *The Chronicle of John Hardyng* (London, 1812), p. 425.

¹⁵ J. Akerman, *Cartographies of Travel and Navigation* (Chicago, 2006), p. 17.

¹⁶ J. Singman, *Daily life in Medieval Europe* (Westport, 1999), p. 215.

¹⁷ J.B. Mitchell, 'The Matthew Paris Maps', *The Geographical Journal*, 81 (1933), p. 29; C. Fleet, M. Wilkes, and C. W. J. Withers, *Scotland: Mapping the Nation* (Edinburgh, 2012), p. 35.

The geographical shape of Scotland took a while to develop within chorography and cartography. To a certain degree, this delay was due to the primary intention of the early maps being associated with travel and trade and not of geographic shape. Ptolemy's map is notably skewed due to a misunderstanding that a certain latitude was necessary for human existence. The map of Matthew Paris also depicts Scotland as an interesting shape, strongly stressing the major watercourses of the Firths of Clyde, Forth, and Tay. Gough's map also portrays Scotland with little recognition of its geographical shape except for the representations of the major watercourses.¹⁸

A.2.2.3.a: Edward I (1296)

When the textual sources were placed in order according to date, the itinerary of Edward I was the first textual description of Scotland that was relevant to Angus. There were a few clear motivations behind this source. Edward I had a straightforward itinerary laid out for returning from his triumphant rendezvous with Balliol at Montrose. Naturally, the choices for accommodation were made based on the ability to provide the required facilities for lodging the king and his retinue within reasonable distance of the intended route. The surrounding political agenda pushed Edward I into making his presence known in as many places as possible, given both time and requirements¹⁹. Thus, the sites detailed in the written itinerary provided information on the centres of power within the surrounding area, including key ports, trading,

¹⁸ The Bodleian Library, MS. Gough Gen. Top. 16. Linguistic Geographies: The Gough Map of Great Britain: www.goughmap.org. For a full discussion of the evolution of Scottish maps see: C. Fleet, M. Wilkes, and C. W. J. Withers, *Scotland: Mapping the Nation* (Edinburgh, 2012), p. 35; and J. E. Shearer, 'The Evolution of the Map of Scotland', *The Scottish Geographical Magazine*, 21 (1905), pp. 289-301.

¹⁹ P.H. Brown, *Early Travellers in Scotland* (New York, 1891), p. 5.

governance and fundamental lordship centres; however, it lacked any mention of topographical definition.

A.2.2.3.b: Hardyng (1457)

The topographical understanding of Angus developed almost one hundred and fifty years later, when texts were written to inform a distant audience rather than to report on activities. John Hardyng's textual description begins a development that focused on key identifiable features within the landscape and core trading points. The *Chronicle of John Hardyng* from 1457 is accompanied by a map that does little to make the geographical makeup of Scotland known to the reader but instead focused on demonstrating idealised and desirable fortifications and architecture. This piece was clearly designed to convince King Henry VI to invest his time and resources in another war to obtain Scotland for the English crown.²⁰ The description of Angus is clearly focused on getting an army up from Perth to Aberdeen. In order to make this route known and passable for someone who was unfamiliar with the land, it was important to define the route by large topographical and anthropogenic features. It was also important to minimise the route's placement over difficult terrain to a minimum and gain control of the port towns. Hardyng's route was clear, directing the army east from Perth and along the north side of the Tay to Dundee. At Dundee he instructed a turn north in order to follow the coast through Arbroath and Montrose until the Grampian Mountains were reached. This text was the first textual indication of the topographical features within the sheriffdom but their significance in defining the

²⁰ C. Fleet, M. Wilkes, and C. W. J. Withers, *Scotland: Mapping the Nation* (Edinburgh, 2012), p. 38.

territory to a completely unknowing party, though not absolutely correct,²¹ made this element of the description necessary. Hardyng's directions plainly define Angus within its major topographical boundary markers: the River Tay to the south, the North Sea to the East, and the Grampian Mountains to the north; however, there is no indication of what the area within this periphery contained.

A.2.2.3.c: Rutter (c. 1540)

Although most of the early geographical information came from outside sources seeking information about Scotland, the sixteenth century saw the start of efforts for local production of geographical knowledge. One major effort was James V's initiating a recorded navigation (called a rutter) around Scotland, which has been attributed to Alexander Lindsay c. 1540. Some historical sources have assumed that this rutter was a record of the travels of James V in 1540 but Taylor's assessment of itineraries of this voyage and the rutter stressed that 'the Rutter is a set of instructions and not a record of an actual voyage.'²² It is also evident that the original text was a compilation of several sets of instructions that covered the range of a suggested voyage rather than a record of the events of one specific journey which has only been complicated by the many versions of the rutter which survive today.²³ Therefore, it was probably created to be used for this voyage and similar voyages and provides key

²¹ Angus does not fully extend along the coast to the Grampian Mountains, but instead stops at the North Esk.

²² A.B. Taylor, 'Alexander Lindsay: A Rutter of the Scottish Seas Circa 1540', *Maritime Monographs and Reports*, 44 (1980), p. 15.

²³ *Ibid*, 28.

information about what land features were used for navigation from the sea and what ports were important for safe travels. Along the coast of Angus the rutter identified the three main features needed for safe travelling along the northern side of the mouth of the River Tay (avoiding the dangers of Bell Rock), Barry, Broughty Ferry, and Dundee, and markers for safe travel north along the Angus coast: Red Head and staying along the southern shore of the river mouth at Montrose to avoid a dangerous bed of sand.²⁴ Obviously, Dundee and Montrose are both important harbours and ports in Angus, though the structures of greatest note for navigation were the church at Barry and Broughty Ferry. Red Head was the only natural feature noted for guidance rather than noted as a potential danger. Although this in itself does not provide much information about Angus, or Scotland in general, it was greatly influential in the creation of many late sixteenth and early seventeenth century geographical sources, especially navigational sources, featuring Scotland.

A.2.2.3.d: Camden (1586)

Although both Boece and Buchanan contain chorographic elements in their text to provide a back for their histories, the first text to be completely dedicated to a chorographic description of Britain and including discussion of Angus was Camden's *Britainia*. This document appeared to be the first text which weighed topographical, settlement, religious and lordly architecture features relatively evenly. The North Esk and the Tay were first labelled as the northern and southern border divisions of Angus. Camden then proceeds to describe the largest social developments from West to East, noting the great castle of Glamis and the burghs of Forfar and Dundee. The North Sea

²⁴ NLS – MS. 33.2.27 (Balfour text).

is noted and the coast followed north through Arbroath and Red Head to the South Esk. Here, Camden deviated from the other sources by describing the features found up the River South Esk. He also mentioned Finavon Castle and Brechin. The coast is represented with the mention of Montrose and a settlement called Boysack. The connection that Camden makes between Brechin and Finavon Castle and the South Esk brings out the relationship that these places have within the contextual landscape, with specific emphasis on route. Camden's chorographic intentions brought the understanding of the connections between social development and topography to light and noticeably aimed to provide a balanced description of the area.

A.2.2.3.e: Buchanan (1582)

George Buchanan's *Rerum Scotticarum Historia*, published in 1582, provided a notably different picture of Angus. It was the first source that primarily focused on topographical features, with six of nine named sites pertaining to the landscape. Buchanan confirms the significance of both North and South Esk rivers and their valley, Red Head, as well as the Tay. In his attempt to provide some history on the name of Dundee, Buchanan mentioned the hill, Dundee Law, providing a small addition to the known topography. Interestingly, the account of social development focused on the south, mentioning only Coupar, Dundee and Arbroath. The text's narrative quickly continued north to the Mearns and Aberdeen without any mention of Montrose. Buchanan's description of Angus comes at the end of a portrayal of the Tay, explaining his focus on the southern features of Angus. Chorography was a small but significant part of his work and was driven by the agenda of the rest of the text: to focus on features of navigation and access.

A.2.2.3.f: Nicolay (1583)

Although a map drawn from George Lily's description of Scotland showing the country in a close approximation of its geographical shape was created in 1566 by Paolo Forlani, it was the Nicolay map which established the more modern shape of the island.²⁵ Nicolay was a French cartographer who relied heavily on Lindsay's Rutter in creating a map of Scotland. Draft copies of his map of Scotland were consulted by French invading forces and later by private parties from around 1547, but the map was not published until 1583.²⁶ The description of Angus from Nicolay's account is more detailed, though less specific with regard to hazards in the water, with a lack of indication of Bell Rock near the mouth of the Tay and that sailing toward Barry (which is not shown on the map) would aid in bypassing this hazard. However, other possible places of interest were added, such as Panbride, Arbroath and the waters of Lunan, South Esk, and North Esk. Generally, the Nicolay map established a fairly accurate understating of the coastline.²⁷ Nicolay's map was used as a chart of the waters around Scotland through to the eighteenth century.²⁸

²⁵C. Fleet, M. Wilkes, and C. W. J. Withers, *Scotland: mapping the nation* (Edinburgh, 2012), p. 39.

²⁶P. Barber, 'England II: Monarchs, Ministers, and Maps 1550-1625' in D. Buisseret (ed.) *Monarchs, Ministers and Maps: The Emergence of Cartography as a Tool of Government in Early Modern Europe* (Chicago, 1992), p. 51.

²⁷J. Bartholomew, 'Early Scottish Cartographers', *Scottish Geographical Magazine*, 67 (1951), p. 102.

²⁸M. Rackwitz, *Travel of Terra Incognita: The Scottish Highlands and Hebrides* (Münster, 2007), p. 27.

A.2.2.3.g: Taylor (1618), Morer (1689), and Defoe (1724)

Travel writing was a limited source of data for understanding the fifteenth and sixteenth century Angus landscape; however, it does offer some indication of the long-standing points of rest when moving through Angus. The earliest writer, John Taylor in 1618, mentions having gone to Brechin, Forfar and Dundee, where he crossed the Tay. Taylor was traveling south from Aberdeenshire and makes no description of the area other than that he stopped in Brechin only to leave quickly due to unwanted interactions.²⁹ The next in date comes from Rev. Thomas Morer, who composed the text as he served as chaplain to a Scottish regiment in 1689. He described their movements from Perth to Forfar and down to Dundee, where he mentioned Dundee Law and the Tay.³⁰ Daniel Defoe's text of 1724 provided some more details, confirming that Dundee and Montrose remained the key settlements on the east coast north of the Tay and that Brechin and Glamis were still prominent centres inland. The only addition to the knowledge of this area is his mention of Strathmore running along the western side of Angus.³¹ The concepts of these places were clearly consistent to a degree and prove to have been focal points that can be used to determine earlier landscape change and development.

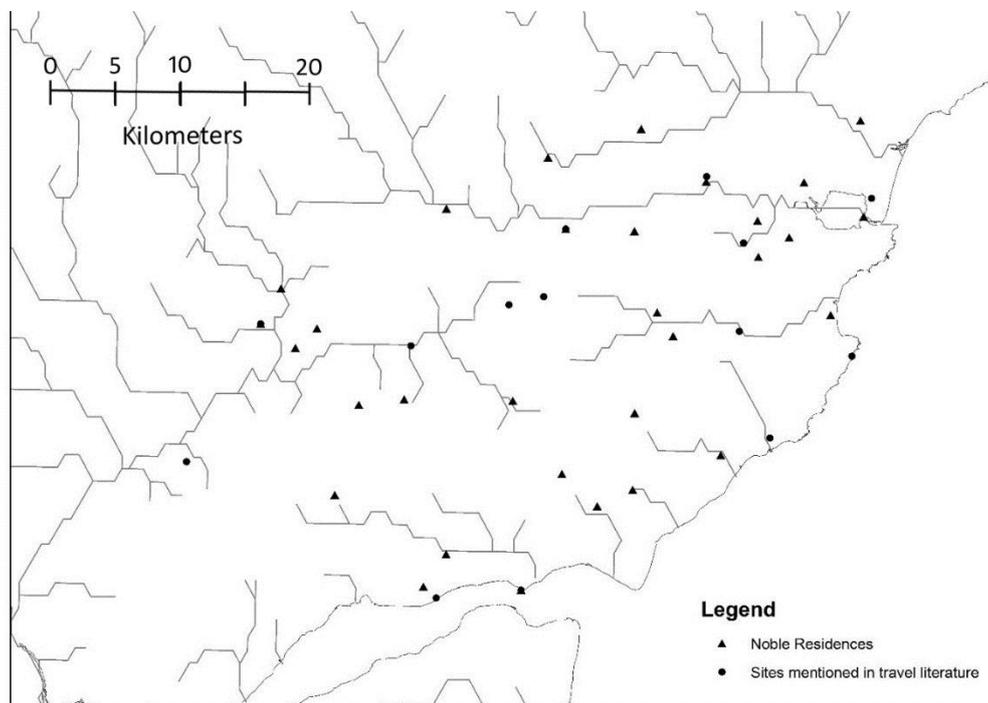
Map A.1 shows the locations of the sites mentioned in the travel writing and those of the noble residences included in this study. From the map, it is immediately clear that Angus was richly populated by noble residences. Some of these could have been seen

²⁹ H. Brown (ed.) *Early Travellers in Scotland* (Edinburgh, 1891), p. 125.

³⁰ *Ibid.*, p. 279.

³¹ D. Defoe, *Tour Through the Whole Island of Great Britain, Letter 13, Part 2*, <<http://www.visionofbritain.org.uk/travellers/Defoe/40>> [accessed 24 Feb. 2011].

from coastal travel routes and some of which are clearly on land routes between the mentioned locations. There are many more that fill the countryside with focal points for location interaction and commerce. However, this map also demonstrates the contemporary relational location of the noble residences. The features mentioned in the travel writing are the places to which the location of these other sites were relational. Although this does not provide an exact understanding of the relational framework used for fifteenth and sixteenth century sense of location, it does provide some major points of reference likely to have been used for relational identification during this time.



Map A.1 : Noble Residences Relational to Sites Mentioned in Travel Literature

A.2.2.4: Content Agenda

The sources discussed in this chapter provide more information about the content of the landscape in terms of resource availability and land-use. As chorographic and cartographic studies of Scotland grew in number and scope over time, they furnished more and more potentially valuable data for this study. It is through these sources that more information is provided about the context of the landscape and that the identification of location in the strict sense of exact coordinates within a modern geo-referencing system was possible. However, as none of these sources represent a perfect picture of the landscape content needed for this project, the final database used to assess the landscape was built up from information found in the wide variety of sources discussed below.

A.2.2.4.a: Boece (1526)

A move toward addressing the wider content of the landscape of Angus can be found within the text of Hector Boece's *Scotorum Historiae*, published in Paris in 1526. Boece's description of Angus, his home county, added more details of the topography and the significant social centres. The description was systematic, dividing Angus by the three major rivers: bounded to the North by the North Esk, divided by the South Esk, and bounded on the South by the Tay. There was also a note on Red Head falling into the North Sea and the resource production of Glen Esk. The four burghs of Angus were listed as Dundee, Montrose, Brechin, and Forfar. This was followed by the three major

religious houses: Resteneth Priory, Arbroath Abbey, and Coupar Abbey. Though much of this information had previously been raised by other sources, Boece's narrative was most likely the first to meet with a wide audience and it helped develop an understanding of Angus within the clear parameters of major water courses, unique topography, burghs and religious institutions. Boece further suggests that there was a significant amount of development within the unmentioned countryside by noting the existence of 'a grete noumer of castellis, that it wer our tedious labour to writ thaim all.'³² A similar comment was made about the lochs within the area. Although Boece could have provided a detailed account of the landscape features and social developments within Angus, it is clear that he made a choice to leave these details aside and continue with his history of the entire nation. However, the acknowledgement of a greatly developed countryside was a significant movement towards recording the locations of noble residences and the development of their landscapes. Although the county of Angus continues to be defined at this point by major settlement and topographical features, the idea that location includes much more was very present in Boece's descriptions.

A.2.2.4.b: Sibbald (1684)

The first text that began to fill in extensive details of the area surrounding the major burghs in Angus was Sibbald's *Scotial Illustrata* description written in 1684. Sibbald emphasised that a large number of the sites described had been physically altered with

³² Boece, xxxvi translated into Scots by John Bellenden in P.H. Brown, *Early Travellers in Scotland* (New York, 1970).

the social and stylistic changes since the Reformation and Unionisation.³³ Nevertheless, he denotes seventy-nine features that were identified as being castles, tower-houses or houses. This identification brings Boece's claim of writing about all the houses being 'over tedious' into perspective. There are extensive descriptions of the surrounding landscape of the noble residences that have assisted in identifying the elements of continuity along with changes made to the landscape. Landscape features mentioned which belonged to an older landscape included woodland around Finavon, an old park and wood around the old castle of Panmure, and fishings and cruives below the walls of Brechin Castle.³⁴

A.2.2.4.c: Pont (1583-1896)

The maps and textual descriptions produced by Timothy Pont in the late sixteenth century were the first documents to attempt to record a full range of settlements, natural topography, and land use through Scotland. Fortunately, a significant portion of the manuscripts relating to Angus survive,³⁵ which has provided a significant amount of data in relation to the identification of landscape features within the surrounds of the noble residences in Angus. Although Pont's maps were drawn about forty years after the concluding time period of this study, it has been assumed that the locations of many of

³³ Unionisation refers to the union of the Scottish and English crowns in 1603 by James I and VI. For further information see: R. A. Mason, *Scots and Britons: Scottish Political Thought and the Union of 1603* (Cambridge, 2006).

³⁴ Sibbald in W. Macfarlane, *Geographical Collections Relating to Scotland Made by Walter MacFarlane* (Edinburgh, 1907), pp. 37, 40, and 48.

³⁵ Five different maps (Pont 26, 28, 29 and 30) survive, each covering different areas, though there is some cross over, of Angus. These different representations provide many perspectives on the area, but also create a unique portrayal of space and distance which does not correspond to our modern perception of scale.

the features would not have moved much, if at all, during that time. Pont created detailed depictions of the settlement developments and the available resources, demonstrated through topographic and anthropogenic landscape features, including high mountain grazing, fishing and mills on water ways, meadows and woodland.³⁶ This type of representation clearly placed the development of noble castles, burghs, abbeys, and other settlements within the context of resources that were used on a daily basis and exported through the indicated ports. In this way, they represent both the ideas that might have been useful for location and a representation of the physical location of features. Pont's maps display many interesting details about the content of the landscape, some of which are discussed below; this project only assesses attribute features that could be identified by a contemporary documentary source and through geographic or archaeological evidence.

When assessing the Pont maps for evidence of noble residential surroundings it is important to understand the symbols and textual references used in the manuscripts. Pont used a combination of what appeared to be set symbols and representative drawings of the physical features that were actually present at the time of his survey. Smout, Stone and McKean have attempted to identify the specific meanings behind what was drawn on Pont's maps, such as the symbols used for woodland and architecture.³⁷ McKean created nine stages of architectural classification but no other specific qualities of the symbols were identified.

³⁶ C. Smout, 'Woodland in the Maps of Pont' in I. C. Cunningham (ed.) *The Nation Survey'd: Essays on late sixteenth-century Scotland as depicted by Timothy Pont* (East Lothian, 2001), p. 85.

³⁷ J. Stone, 'An Assessment of Pont's Settlement Signs'; C. Smout, 'Woodland in the Maps of Pont'; and C. McKean, 'Timothy Pont's Building Drawings' in I. C. Cunningham (ed.) *The Nation Survey'd: Essays on Late Sixteenth-century Scotland as Depicted by Timothy Pont* (East Lothian, 2001), pp. 54, 79, 117.

It is very clear that most of the symbolism of the Pont maps is focused on the potential value of the location and economic production within the area. All indications of topography and anthropogenically developed land have been taken as an indication of economic resources, as every type of landscape shown would have signified a type of resource and every settlement, however small or large, would have been indicative of production and consumption.³⁸

Created as small-scale, high-detail depictions of local regions in Scotland, the maps further developed understandings of landscape features and land-use. These smaller scale maps continued to demonstrate the importance of places of economic development represented in the previously discussed larger scale maps, but also provided a detailed understanding of the exact features that made up the daily subsistence and exportable qualities. Great attention was placed on landholdings, both small and large, and their features. These included water, connected wetlands, and industrial production sites, such as mills. Other features included enclosures, parks, forests, gardens, orchards and woodland. The position of aristocratic architecture displayed both the potential bounty available on a daily basis and the parameters within which people would have interacted with these landscapes. The study of Pont's maps provides excellent detail of late sixteenth century resource management within built and rural landscapes, which are useful when looking at previous stages of land usage.

Water was perhaps the most frequently depicted feature on Pont's maps. The significance of the watercourses, whether they were large or small, was not taken for granted by the people living on them or by Pont. Although Pont's maps appeared to be more focussed

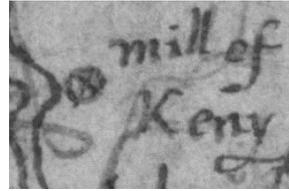
³⁸ N.J. Higham, *Place-Names, Language and the Anglo-Saxon Landscape* (Woodbridge, 2011), p. 173.

on displaying the industrial development of mills along the waterways, the other resources gained from waterways were perhaps ‘too obvious’ for Pont’s annotation. The wealth of food substances and construction material that was gained from water areas and exploited through rights or leisure activities was a fact of life to those living in a pre-drained (or at least a ‘less drained’) time in Scotland.

The mills represented in Pont’s maps were important for several reasons: not only were they places where grain was ground but the ‘rights’ attached to them made the mills a gathering place for those tenants living on the often locally dispersed property to which the mill was attached. For this reason, these places played a central role in communicating with the population, often for the lords to give out information but also for the tenants to bring issues and cases to the lord.³⁹ On the Pont maps, mills were noted in several forms: there were circles with a cross, which indicated the mill, either next to a small building (as in Figure A.2.1) or alone (as in Figure A.2.2). The symbol for a mill did not always have the annotation of the mill name. Although these mills appear to be drawn on substantial watercourses, it is important to remember that milling technology of the time depended more on the ability to gather water rather than significant water flow.⁴⁰

³⁹K. Van der Beek, ‘The Effects of Political Fragmentation on Investments: A Case Study of Watermill Construction in Medieval Ponthieu, France’, *Explorations in Economic History*, 47 (2010), p. 370.

⁴⁰A. Lucas, *Wind, Water, Work: Ancient and Medieval Milling Technology* (Boston, 2006), p. 36. Also see discussion of mills in Chapter Four – p. 115

Figure A.2.1.: Pont 26- Mills ⁴¹Figure A.2.2.: Pont 30- Mills⁴²

The watercourses also provided fishing resources. Although the most valuable fishing rights were on rivers where the salmon would run, pike, trout and eels were also a valuable source of food that was less seasonal.⁴³ Pont does not specifically mention the locations of the fishings though the documentary evidence describes fishings along the North and South Esk and the Tay.⁴⁴ The rivers and wetlands also provided the necessary habitat for the development of wild fowl and useful vegetation such as reeds, willows, birch and alder saplings used for thatch, wattling, fences and basketry. The rivers seasonally flooded the surrounding areas, creating meadow lands which provided hay and more habitats for wild fowl.⁴⁵ The resources gained from these landscape features are more fully discussed in Chapter Four.⁴⁶

⁴¹ Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

⁴² Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 30, c.1583-96.

⁴³ R. C. Hoffman, 'Economic Development and Aquatic Ecosystems in Medieval Europe', *The American Historical Review*, (1996), p. 635.

⁴⁴ A. O'Sullivan, 'Place, Memory and Identity Among Estuarine Fishing Communities: Interpreting the Archaeology of Early Medieval Fish Weirs', *World Archaeology*, 35(2004), p. 451. Also see Chapter Four, 119.

⁴⁵ A. Ross, 'Literature Review of the History of Grassland Management in Scotland', *Scottish Natural Heritage Commissioned Report*, 313(2008), p. 6.

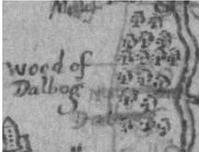
⁴⁶ Chapter Four, p. 148.

It is through Pont's maps that the proximity of these wetland characteristics to the noble castles, burghs, towns and abbey developments can be more fully understood. The locations of many of the aristocratic structures along these watercourses, as well as those on or near lochs, put these resources within close proximity of these structures and made these resources immediately available to the household. This proximity demonstrated the immediate wealth and prosperity enjoyed by the household of the structure on a seasonal and daily basis. Not only did the waterways provide economic stability, they also created an avenue for social interaction and control through milling and fishing rights, along with any other rights to take part in the resources.

Another key feature that Pont noted on his maps was the areas of woodland. As mentioned before, there are two types of symbols for trees used by Pont, the first being rounded (Figure A.2.3) and the second being composed of crossed vertical lines (Figure A.2.4). Smout has attempted to determine whether these symbols were specific to a species or type of woodland but has found no indication of either.⁴⁷ The resources that were found in woodland would have been equally essential to the daily functions of the noble household. Not only did the woods provide building material, but they also were resources for grazing, pannage and providing shelter for game.⁴⁸ Orchards also provided fruit and the nectar essential for the raising of bees, allowing the production of honey and wax.

⁴⁷ C. Smout, 'Woodland in the Maps of Pont', p. 79.

⁴⁸ I.D. Rotherham and P.A. Aardron, 'The Archaeology of Woodland Landscapes: Issues for Managers Based on the Case Study of Sheffield, England and four thousand years of Human impact', *Arboricultural Journal: The International Journal of Urban Forestry*, 29(2006), p. 231.

Figure A.2.3.: Pont 30 - Woods⁴⁹Figure A.2.4.: Pont 26- Woods⁵⁰

Pont also demonstrated a number of enclosures, most of which contained woodland. Some of these enclosures were detached (as seen in Figure A.2.5) but most of them were attached to a structure (as is seen in Figure A.2.6). The separated enclosures were clearly labelled as parks in some instances, demonstrating that specifically reserved land sometimes featured within a very close proximity of the noble residence. Most of the woodland, however, was shown outside enclosures.

Figure A.2.5.: Pont 29- Enclosure⁵¹Figure A.2.6.: Pont 26 - Enclosure⁵²

Although Pont does demonstrate a sense of the location of these noble residences and the surrounding landscape, it is relational only to the other features within the map and

⁴⁹ Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 30, c.1583-96.

⁵⁰ Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

⁵¹ Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 29, c.1583-96.

⁵² Reproduced with permission from the National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

cannot be directly attributed to modern coordinates. Therefore, later geographical sources were needed to identify the modern location of these residences and features for this study. The identification of the location of the structures of the noble residences through later geographic sources was a straightforward procedure, but it was the identification of the mill structures, the only other structural features that could be identified without extensive archaeological excavation, which required extensive investigation, outlined below.

A.2.2.4.d: Gordon (1636-1652)

The Gordons, both Robert and his son James, were greatly involved in the eventual publication of Pont's maps and drawings in Bleau's Atlas. Although Bleau had received some of Pont's text and drawings, it appears that Robert Gordon was enlisted to edit and potentially redraft some of the areas of Scotland for Bleau's Atlas. It is suggested that this directive came from a letter from Charles I⁵³ or from Sir John Scot of Scotstarvit to Robert Gordon, who was assisted by his son.⁵⁴ It has been debated how much contact the Gordons had with the Pont manuscripts. Although the Gordons' maps may have been used for the Bleau Atlas, the quantity and coverage of his maps indicates that he had his own cartographic agenda.⁵⁵ James Gordon's map of Fife, drawn on the request of

⁵³ J. Stone, 'Robert Gordon of Straloch', <http://maps.nls.uk/pont/bio/straloch.html>, [accessed 13 March, 2013].

⁵⁴ F.V. Emery, 'The Geography of Robert Gordon, 1580-1661, and Sir Robert Sibbald, 1641-1722', *The Scottish Geographical Magazine*, 74(1958), p. 4.

⁵⁵ J. Stone, 'Robert Gordon of Straloch', <http://maps.nls.uk/pont/bio/straloch.html>, [accessed 13 March, 2013].

Scotstarvit, was used by Bleau in his Atlas, and he continued a programme of map drawing through his life. After the death of Robert Gordon, James Gordon was custodian of the Pont maps and manuscripts, which he later passed to Sir Robert Sibblad.⁵⁶ The manuscripts of the Gordons' maps resemble the Pont maps stylistically, however lack the wealth of detail of the landscape and land-use. Although they do not add to our understanding of Scotland's historic landscape, they do demonstrate a consistent interest in the geography of Scotland and continuous attempts to cartographically represent the contents of the Scottish landscape.

As stated above, the maps drawn by Gordon do not necessarily provide more details than Pont's of the surrounding landscape of noble residences. In fact, they are quite lacking in specific elements other than main structures, settlements, and rivers. This absence of detail is particularly the case with Gordon 41, which represents what Pont drew of the full county, missing information along the east coast. Gordon 42 is a more detailed description of the western part of Angus and so does provide some detail. The main addition of these maps to this project is a confirmation of the importance of many of these sites and their general location within a time period close to Pont, serving as a step leading to the consistent presence of many of the sites through to the later sources that provide us with the coordinates used for this project. However, there are two site depictions that contain features of note. The first is the site depiction of Glamis in Gordon 42, which confirms the deficiency of notation of any mill around Glamis Castle except significantly further south along the Glamis Burn. This absence of notation could just be a result of copying Pont's depictions, but it nevertheless confirms the importance of this mill within

⁵⁶ C. Fleet, 'James Gordon of Rothiemay (c.1615-1686), <http://maps.nls.uk/pont/bio/rothiemay.html>, [accessed 13 March, 2013].

this particular landscape setting.⁵⁷ This form of representation was similarly reproduced with the Gordon 42 depiction of Airlie.⁵⁸ Secondly, the depiction of Inverquharie Castle in Gordon 42 places the mill, which Pont places on the north side of the river on the same side as the main structure, on the south side of the river where the location of the mill is currently known to be, as shown in Figures A.2.7, A.2.8, and A.2.9.



Figure A.2.7: Inverquharie, Pont 29⁵⁹

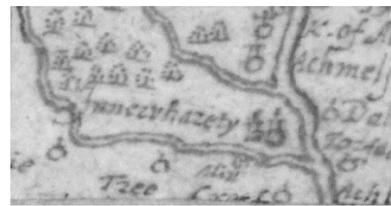


Figure A.2.8: Inverquharie, Gordon 42⁶⁰



Figure A.2.9: Inverquharie, OS NO 60, 1961⁶¹

⁵⁷ National Library of Scotland, Adv.MS.70.2.10, Gordon 41, c. 1636-52; Adv.MS.70.2.10, Gordon 42, c. 1636-52.

⁵⁸ National Library of Scotland, Adv.MS.70.2.10, Gordon 42, c. 1636-52.

⁵⁹ Reproduced with permission from National Library of Scotland, Adv.MS.70.2.9, Pont 29, c.1583-96.

⁶⁰ Reproduced with permission from National Library of Scotland, Adv.MS.70.2.10, Gordon 42, c. 1636-52.

⁶¹ Reproduced with permission from National Library of Scotland, OS NO 60, 1961. (Image covers approximately 10km².)

A.2.2.4.e: Edward (1678)

The cartographic efforts of the Gordons contributed to the published image of Scotland as a whole in the seventeenth century, but Angus as a shire was under-represented until the map of Robert Edward. Not much is known about Robert Edward himself or what drove him to draw a map of Angus. Given that Edward's map was inserted to represent the missing Angus, it is generally agreed that the lack of Angus in the 1654 version of Blaeu's atlas was the main impetus behind this map. What little is known about his life survives in the record of his activities within the Church of Scotland, having served in the parishes of Kirkmichael in Ayr and Murroes in Angus. He was also noted as the Moderator of the Presbytery of Dundee between 1676 and 1678 with influence over lands in Ballumbie and Powrie. Like Pont, Edward's relationship with the Church of Scotland within Angus may have influenced his understanding of both the landscape of Angus and cartography. As maps of Angus drawn by both Pont and Gordon existed when Edward drew his map and there are many similarities between them, Martin suggests that these maps were used by Edward as sources for his map.⁶²

Edward's maps fail to indicate how the land was used at the time. The influence of Gordon's maps is clear, from the use of symbols to the content of the maps. Edward's map is useful for this project and its dataset because it helps establish continuity of the location of certain places. As well, there are two site representations that merit mention here, both of which relate to enclosures. First, Edward's depiction of Edzell shows an

⁶² A. I. Martin, 'A Study of Edward's Map of Angus, 1678', *Scottish Geographical Journal*, 4(1980), p. 39.

enclosure around the main structure that is bordered on one side by the Wester Water and touches the North Esk on the top-right corner. It is uncertain whether this particular boundary actually existed, but this map does clearly indicate what was commonly understood as the extent of the main surroundings of this noble residence, which proved helpful when identifying the fishings, as discussed in Chapter Four.⁶³ Likewise, Edward's depiction of Panmure clearly outlines enclosures around both the site of the old castle and the new manor house. The enclosure of the old castle consists of the Monkie Burn, which had bridge access. The enclosed lands for the new house appears to include a section of the Boath Burn.⁶⁴ Both of these enclosures are replicated in Moll's map of 1745.⁶⁵ Though neither one of these enclosures can be identified today, both these depictions provide a significant indication of the extent of the main surroundings of these noble residences as understood in the seventeenth century, probably carrying back to the sixteenth century.

A.2.2.4.f: Moll (1745)

Herman Moll was a German engraver who had moved to London, initially working for Moses Pitt and then establishing his own business.⁶⁶ Some of Moll's world maps would

⁶³ Chapter Four, p. 123.

⁶⁴ National Library of Scotland, EMS.s.35, Edward, 1678.

⁶⁵ National Library of Scotland, EMS.b.2.1(23), Moll, 1745. and Appendix A. p. 316.

⁶⁶ D. Reinhartz, 'New Information on Herman Moll, geographer', *Imago Mundi*, 40 (1988), p. 114.

more famously be used in Daniel Defoe's and Johnathan Swift's books.⁶⁷ His maps were intended to be more than literary aids. Inglis writes that with the success of the atlases coming out of the Netherlands, Moll wanted to create his own, focusing on printing a map of greater quality of Scotland. To create his maps, it seems Moll gathered as much current geographical information as he could, potentially including some of Adair's maps.⁶⁸ Moll's maps seemed to correct many of the misplacements of the earlier representations of coastlines and displayed the most accurate linguistic division of Gaelic and Scots at the time.⁶⁹

A.2.2.4.g: Roy (1752)

The detail and close scale of Roy's map of Scotland make it an incredibly useful resource as a 'historical cross-section – of the entire country at a single point in time.'⁷⁰ The idea for mapping Scotland did not originate with Roy himself, but from the Deputy Quartermaster-General in North Britian, Lieutenant Colonel David Watson. As Watson's assistant at the time, Roy became involved in the mapping project. Roy's reflected the impact of conflicts within Scotland after the Hanoverian king gained the British throne. The king funded a survey of land to counter the Scot's potential military advantages on

⁶⁷ B. Fishman, 'Defoe, Herman Moll, and the Geography of South America,' *The Huntington Library Quarterly*, (1973), 227-238; A. Sills, 'Eighteenth-Century Cartographic Studies: A Brief Survey,' *Literature Compass*, 4 (2007), pp. 981-1002.

⁶⁸ John Adair drew maps of Scottish counties between 1682 and 1688. For Further information see: H. Inglis, 'Early Maps of Scotland and their authors', *Scottish Geographical Journal*, 34 (1918), p. 225.

⁶⁹C. W. J. Withers, 'The Scottish Highlands Outlined: Cartographic Evidence for the Position of the Highland-Lowland Boundary,' *Scottish Geographical Magazine*, 98 (1982), p. 156.

⁷⁰ R.A. Skelton, 'The Military Survey of Scotland 1747-1755', *Scottish Geographical Magazine*, 83 (1967), p. 5.

geographical knowledge. For two years after 1749, it appears that Roy was the only person working on the project. The method for his actual survey was based on the use of two chains (each 45 to 50-feet in length), with a team of a non-commissioned officer and six soldiers. Specific attention was placed on rivers, streams, lakes of both fresh and salt water, and roads all drawn within a colour-coding system.⁷¹ This survey pays some attention to historical landscapes likely because of Roy's interest in Roman antiquities.⁷² Despite the importance of this survey project to both the military and society generally there were a limited number of people available to assist Roy in his survey, which might explain the lack of accuracy (noted by modern eye). Roy knew of the inaccurate scale of some of the areas but did not work to correct them, as the map remained purely a military sketch.⁷³ Roy's picture of the landscape of Scotland shows a time period just after many major draining projects had been established and as many properties were enclosing their land⁷⁴ provides us with a vivid indication of some of the changes of land-use and how early or late they might have been.

Roy's maps demonstrate great consideration of much of the land exploitation, with clear references to places of agricultural development and structures within the rural environment. For this study, Roy's maps have been particularly beneficial for the identification of the location of certain mills. Although a mill south of Airlie along the

⁷¹ R.A. Skelton, 'The Military Survey of Scotland 1747-1755', p. 6, 8.

⁷² R. A. Gardiner, 'William Roy, Surveyor and Antiquary', *The Geographical Journal*, 143 (1977), p. 443.

⁷³ C. Fleet and K. C. Kowal, 'Roy Military Survey Map of Scotland (1747-1755): Mosaicing, Georeferencing, and Web delivery', *Perimtron*, 2 (2007), p. 195.

⁷⁴ G. Whittington, 'The Roy map: The Protracted and Fair Copies-Part One', *Scottish Geographical Magazine*, 102 (1986), p. 19.

River Isla, also the parish border marked by Knox,⁷⁵ was identified in previous maps, and judging from the proximity and the lack of other mills noted in the area it was presumed to be connected to Airlie, Roy's map is the first map that identifies it as connected to the Airlie residence.⁷⁶ The depiction of Edzell shows the motte from the previous structure and also indicates a mill close to the modern location of the town along the River North Esk.⁷⁷ When depicting Melgund, Roy identified the mill for Melgund near a bend in the Melgund Burn and likewise, the mill of Dun along the Dun Burn.⁷⁸

A.2.2.4.h: Ainslie (1794)

John Ainslie, a resident of Edinburgh, surveyed Scotland in one trip in 1777. From this journey he was able to publish a map of Scotland in nine sheets seven years later.⁷⁹ This survey led to a highly successful run of published maps. Later Ainslie was involved in survey work for the placement of canals from Edinburgh to Glasgow and Paisley to Ardrossan, and other road works.⁸⁰ Fleet, Wilkes and Withers identify him as one of the

⁷⁵ John Knox took sixteen tours of Scotland between 1764 and 1775 in an attempt to improve the fishing and manufacturing in Scotland. In 1782 he drew a map of Scotland along with descriptions of his travels. For further information see: C. W. J. Withers, 'How Scotland Came to Know Itself: Geography, National Identity and the Making of a Nation, 1680-1790', *Journal of Historical Geography*, 21 (1995), p. 371-397.

⁷⁶ British Library, Maps K.Top.48.25-1.a-f, Roy, 1747-55. / National Library of Scotland, EMS.b.2.141, Knox, 1850.

⁷⁷ British Library, Maps K.Top.48.25-1.a-f, Roy, 1747-55.

⁷⁸ British Library, Maps K.Top.48.25-1.a-f, Roy, 1747-55.

⁷⁹ J. Bartholomew, 'Early Scottish Cartographers,' *Scottish Geographical Magazine*, 67 (1951), p. 104.

⁸⁰ I. H. Adams, 'The Land Surveyor and His Influence on the Scottish Rural Landscape,' *Scottish Geographical Journal*, 84 (1968), p. 251-256.

original Scottish professional map makers.⁸¹ The detail and accuracy of Ainslie's map was exceptional for its time, potentially contributing to the plans for detail, which the Ordnance Survey would later produce.⁸²

Ainslie's maps also show areas of major planting within the landscape of Angus, and also identifies the main settlement development of the rural landscape. Ainslie clearly identified the mill belonging to Affleck as along the Pitlairlie Burn, rather than the Monikie Burn, which would have been closer.⁸³ Likewise, the mill at Bonnyton can be identified from Ainslie's maps along the Little Pow water, as well as the mill of Balgillo along the Digty Water related to the Broughty property. There are two mills indicated by Ainslie upstream of Panmure along the Monikie Burn and near the parish border indicated by Knox which are likely to be in a similar position to fifteenth and sixteenth century mills.⁸⁴ Likewise, the mill labelled as the Lunan Mill on the Lunan Water and parish boundary as depicted by Knox near Redcastle is a likely representative of the location of the mill for Redcastle.⁸⁵ The locations of all but the Panmure mills were further confirmed by Thomson's map.⁸⁶ Interestingly, Ainslie's 1794 map is the first to have referred to the property of Fithie having a castle again.⁸⁷

⁸¹ C. Fleet, M. Wilks, and C. W. J. Withers, *Scotland: Mapping the Nation*, p. 111.

⁸² J. N. Moore, 'The Early Cartography of Renfrewshire to 1864', *Renfrewshire Local History Forum Occasional Paper*, 6 (1999).

⁸³ National Library of Scotland, EMS.s.356, Ainslie, See Appendix A. 450.

⁸⁴ National Library of Scotland, EMS.s 356, Ainslie, 1794; EMS.b.2.141, Knox, 1850.

⁸⁵ Ibid.

⁸⁶ (John Thomson published the first atlas of Scotland organised by county. For further information see: C. W. J. Withers, 'The Social Nature of Map Making in the Scottish enlightenment c. 1682-1832', *Imago Mundi*, 54 (2002), pp. 46-66.) National Library of Scotland, EMS.s.712(20), Thomson, 1825.

⁸⁷ National Library of Scotland, EMS.s 356, Ainslie, 1794.

A.2.2.4.i: Ordnance Survey (1801-Present)

The Ordnance Survey (O.S.) has been the most recent and longest lasting cartographic endeavour in Scotland, and the U.K. in general. Its origins stem from the cartographic achievements made by Roy and an acknowledged need for a country-wide survey with an appropriate scale and description of the landscape. The development and methods of creating appropriately triangulated surveys and the widely recognised benefit and use of these maps prompted the French to suggest that an accurate triangulation be prepared between Greenwich and Paris in 1783. Roy's work in applying appropriate triangulation methods to British land surveyed in the Hounslow Heath Base and Greenwich-Paris line caused the Ordnance Survey Commission to develop a plan for bringing the entirety of Britain into this level of geographical understanding. Despite Roy's influence in the desire for a full national survey, this O.S. was not officially started until after his death in 1790. The Master General of the Ordnance, the Duke of Richmond, reinstated a national survey in 1791.⁸⁸ Although the staff working on the surveying was primarily civilian, the focus and outcome of the results of the survey were heavily influenced by the military. For example, the conflicts with Napoleon in France caused the survey to be focused on South east England, producing a one inch to the mile map of Kent. Even after the peace in 1815, the leadership and direction of the surveys tied the survey to military needs.⁸⁹

⁸⁸ B. Irwin, 'The Ordnance Survey: Roy's Legacy', *The Geographical Journal*, 143 (1977), pp. 14-15.

⁸⁹ *Ibid.*, p. 15.

The O.S. was linked to social and administrative demands following issues that arose in Ireland. This move was even more noticeable when the supervision of the O.S. came under the Board of Agriculture, rather than the military. It had become apparent that a valuation of the land in Ireland was needed and the O.S. was given the task to do a general survey of the island. The main outcome of the survey was to be 6 inches to the mile and focused mainly on what properties existed, their character, and their boundaries within a background of topographical representation. The success and usefulness of the Irish survey by 1840 inspired the O.S. to begin working on similar projects in Scotland and England. The first full national survey was published in 1893, almost 100 years after it had begun, and this led to a discussion of the relevance and usefulness of material nearly 100 years out of date.⁹⁰ Along with the basic fact that many of the places had evolved and changed since the survey was done, there was also the issue that the O.S. maps only focused on lands that were registered. At the time, and even after the Land Registry in 1862, registering property was only a voluntarily requirement.⁹¹ This requirement spurred many discussions on how to keep the material presented by the O.S. both current and useful, which is a constant battle even affecting the O.S. today. In order to remedy these faults, a series of revisions were put into place in fixed cycles. However, these amendments had not been successful, and the revisions were refocused to urban areas in 1922.

After World War II, it was decided to introduce new scales (1:1250 and 1: 25000) while putting all the maps under continuous revision policies. Any major debates about the

⁹⁰ Ibid., p.15- 17.

⁹¹ C.J. Sweeny, and J.A. Simpson, 'The Ordnance Survey and Land Registration', *The Geographical Journal*, 133 (1967), p. 11.

presentation and method have always been down to the scale of the maps being published, rather than survey method. Each scale had its value and was useful for various purposes. It was not until 1863 that it was finally decided which scales were to be used for which types of features. Towns with a population of more than 4000 people were represented on a scale of 1:500, while parishes were represented with a 1:2500 scale. The maps of more general features were represented with counties at 1:10560, topographical maps at 1:63360 and U.K. maps at 4 and 10 miles to the inch. Any revision of the maps is done with a defined procedure of the survey team and an examiner, who corrects details where there is error or change and adds details where there was no previous need or mention. Although the set scales used now dictate how the maps are utilized, they have ensured that a variety of developments create a distribution that is wide enough to be useful for most activities.

The continuous revisions were aided by the introduction of new methods developed for geographic use such as aerial photography from World War II, and a renewed attempt to connect cartographic representation to scientific knowledge and cultural identity. With these new and on-going developments, a wider team was developed to incorporate other distinctive features, such as the Board of Archaeology instituted in 1920.⁹²

The primary function of the O.S. within the context of this project has been to identify the location of the sites within the context of a modern coordinate system. Therefore, sites that have been previously identified from historical sources likewise have been

⁹² B. Irwin, 'The Ordnance Survey: Roy's Legacy', *The Geographical Journal*, 143 (1977), p 18-19.

identified on current O.S. maps in order to assign the appropriate coordinate value to identify the exact location of the site. However, some of historical features have only been identified in these twentieth century maps. For example, the mill at Fithie is only identified as Little Fithie on Pow Burn, near to the parish boundary.⁹³

A.2.3: Conclusion

This chapter has focused on the development of the definition of location for the dataset used for later spatial analysis of fifteenth and sixteenth century noble residences and their landscapes. To identify the location of these sites and their attribute features, geographical sources, both historical and modern, were used. Location is the fundamental principle for any spatial assessment and needed to be understood within the relative nature of the historical context within which the sources were created. At the same time, it was also converted to the absolute nature of modern coordinate systems for this dataset to be fully understood.

The spatial relationships underpinning the context and drawing of historical maps demonstrates that these sources were represented travel, economic content, or a bit of both, proving that the external points of reference were mostly primary trading and administrative centres, which is hardly surprising. By mapping the main points identified by travel oriented documents with all the noble residences in Angus documented between 1450 and 1542, it was possible to establish clear reference points within this spatial

⁹³ National Library of Scotland, O.S. NO 65 & NO 75, 1957; EMS.b.2.141, Knox, 1850.

system. Therefore, using the sites mentioned in the travel documents allows for the establishment of a modern sense of relation within the historical context. As documents that were more concerned with the content of the landscape and land-use came into production, increasing the number of possible elements to correlate, the relational identification of these sites became more complex.

The complexity of the relationship of the noble residences and the other features within the landscape is the focus of this project. To assess the potential relationships based on the evidence from the early map records discussed in this chapter and the archaeological and documentary records to be discussed in Chapters Three and Four respectively, it is an imperative to establish the location of these sites to further build the spatial framework used for assessment. The use of these historical maps significantly helps to identify the location of the noble residences and mills. Although the sources used for locating the sites and features have been discussed here, a full list of the identified coordinates can be found in Appendix A under the corresponding site reference.

Chapter 3: Objects in Archaeological Sources

Location establishes the context in which a spatial system can be assessed, as discussed in Chapter Two, but a *spatial system* is structured around a specifically identified object. These *chosen objects* have the characteristics of locations and defining attributes that provide qualities that can be assessed; in other words, objects are the physical entities identified and therefore must have a physical quality. Although both location and the attributes can exist apart from the object, it is the connection to an object that links the location and the attributes, creating a unit that can be spatially analysed. In most GIS datasets the object is represented by a field titled *Object ID*, commonly shortened to ID. Within the GIS dataset, the object is the element that aligns location and attributes. Any spatial queries, whether phenomenal, topological, or distance related, are based around the object.¹ It is the object that the other fields hinge on: ‘the attribute that says what the object is, and the spatial that describes where it is located.’²

The object is the identified entity, having both location and attributes, but is intrinsically tied to a physical presence. Within this study, it represents the material existence of the noble residence. Therefore, it is through archaeological remains (the defined physical presence of these sites) that the object field for the noble residences in fifteenth and sixteenth century Angus can be identified. The scarce physical remains of these sites limit their inclusion in any spatial analysis. This chapter

¹ J. Conolly and M. Lake, *Geographical Information Systems in Archaeology* (Cambridge, 2006), p. 112.

² I. N. Gregory and P. S. Ell, *Historical GIS: Technologies, Methodologies and Scholarship* (Cambridge, 2007), p. 7.

discusses the known methods used to establish the archaeological presence of noble residences in Angus and the physical remains as they survive in three basic states: non-substantive, limited, and substantive.

A.3.1: Archaeological Methods Used in Angus

The archaeological data used for this project was constructed through a desk-based compilation method, collating the known published material of the relevant sites. All site specifications mentioned were based on data from existing specifications; no new surveying was undertaken to retrieve further site information. In order to assign a site ID within the GIS dataset and later use it for spatial and network analysis, information regarding the archaeological remains of the site were assessed. The gaps which exist in the archaeological record for these aristocratic landscapes within Angus were highlighted, identifying several areas for potential future archaeological assessment.

Desk-based archaeological assessment has been established as an important method for developing a thorough understanding of the material relating to sites for concentrated, regional study. Desk-based assessment has been a reputable practice for planned fieldwork preparation, regulated through the management model outlined in 1990³ by the UK Department of Environment (DoE) in Planning Policy Guidance note 16 (PPG16), entitled ‘Archaeology and Planning’ and standardised by the

³ Planning Policy Guidance note 16, Archaeology and Planning (1990), p. 9.

Institute of Field Archaeologists' continuously revised 'Standard and Guidance for Historic Environment Desk-Based Assessment.'⁴ Typical regulations suggest that desk-based assessment was a preparatory step for field work.⁵ However, this method has been widely used without expectations of immediate on-site planned activities. Instead, it provides the appropriate information for the identification and development of future projects. Past projects such as the Historic Rural Settlement Group's desk-based assessment in collaboration with the Royal Commission for Ancient and Historical Monuments in Scotland (RCAHMS), highlighted the existence of vast numbers of previously unrecorded and effectively un-researched sites across the country.⁶ More relevant to the topic of this project is the project undertaken by the Scottish Coastal Archaeology and the Problem of Erosion Trust (SCAPE) and the Archaeological Field Schools of Edinburgh and St. Andrew's Universities, which involved a desk-based assessment of the coastal zone along the Angus coast from Monifieth to Milton Ness in 2009 in order to assess the vulnerability of the coastal zone in that area. Although most of the coast was identified as stable, the following sites were identified as vulnerable: Monifieth Carvan Park, the northern part of the east face of Barry Sands, the south side of Arbroath beach, and (most importantly for this project) the southern half of Montrose Bay.⁷

⁴ Setting Standards in Archaeology, *Standard and Guidance for Historic Environment desk-based assessment* (1994), <<http://www.archaeologists.net/sites/default/files/node-files/DBA2012-Working-draft.pdf>>. [Accessed 16 Feb. 2012].

⁵ Darvill and Russell, *Archaeology after PPG16: archaeological investigations in England 1990-1999* (Bournemouth, 2002), p. 8.

⁶ J. Harrison, et al. 'A Research Framework for Historic Rural Settlement Studies in Scotland' (2011), <<http://molrs.org.uk/downloads/HRSG%20research%20framework%20071108.pdf>>, p. 12. [Accessed 16 Feb. 2012]

⁷ The Scottish Coastal Archaeology and the Problem of Erosion Trust, *The Angus Coast. Coastal Zone Assessment Survey Part 1: Desk Based Assessment*, (2009), p. 270.

The methodology of desk-based assessment of archaeological sites has advanced recently, a progression that has been further enhanced by the recent digital publication of numerous resources. Availability of and access to archaeological material has increased dramatically; the backlog of unpublished excavation reports has been reduced by online data bases and repositories. Large, on-line data repositories such as the CANMORE and PASTMAP databases run through the RCAHMS, the Archaeology Data Service and the Online Access to the Index of Archaeological Investigations Scotland (OASIS), though interlinked, offer a wealth of information on previous excavations and surveys through three different methods of data organization. Digitization of this information allows for easier access to the data but has underscored the need for connecting this information to modern GIS technology in order to facilitate the assessment of spatial relationships.

Attempts to make archaeological data readily available and geographically placed have resulted in the assembly of many on-line, map-based data-sets. These sites have combined many key elements that present a clear picture of historical development and changes. The British Listed Buildings website draws together many details and places them in the context of maps, aerial photographs, satellite imagery and Ordnance Survey map presentations when available.⁸ The largest resource of this kind related to Scotland is the RCAHMS's PASTMAP data set. This combines a large number of archaeological resources into an on-line GIS, using the digital details

⁸ British Listed Buildings, Scotland, < <http://www.britishlistedbuildings.co.uk/scotland/angus>>. [Accessed 9 March, 2012]

of the O.S. as the base-map.⁹ The Angus-specific map resource is run through the Angus Council and is titled Angus Maps.¹⁰ Although these online representations present a wealth of information about the archaeological evidence available in Angus, they only present a general picture of the area; further investigation was needed to identify sufficient data to answer questions about the historical spatial arrangements of specific estates.

The need to bring advanced mapping technology into archaeological practice and the benefits of GIS for disseminating basic archaeological data to the public has been demonstrated by many projects in development. There are several that have made this information available to the public, like ORBIS¹¹ and DigDag.¹² Although using GIS has become more and more popular for presenting archaeological data, this technology is applied to the study of archaeological material only infrequently. This study brings together available archaeological information on Angus to assess the social and political relationships of medieval nobles with their surrounding environment. Because this particular spatial analysis focuses on the possible interactions between features of the exterior landscape and the structure of the castle, it was important to demonstrate not only the location of the structure within the landscape but also interior arrangements when the archaeological evidence has

⁹ Royal Commission on the Ancient and Historical Monuments of Scotland, <<http://pastmap.org.uk/>>. [Accessed 10 March, 2012]

¹⁰ Angus Council, Angus Maps, <<http://www.angus.gov.uk/atoz/mappagewide.cfm?mapID=WgHRLNrah3Q%3d&pagehead=Angus%20Maps>>. [Accessed 10 March, 2012]

¹¹ ORBIS, <<http://orbis.stanford.edu>>. [Accessed 12 March, 2012]

¹² J. G.G. Jakobsen, <<http://batchgeo.com/map/1b0e9ae9972e58fa9147cb6a351f36e0>>. [Accessed 12 March, 2012]

allowed. The archaeological data was primarily useful for establishing the basic framework within which to structure spatial analysis.

A.3.2: Archaeological Methods Used for Angus

A.3.2.a: Architectural Survey

The study of antiquities has always had a focus on architectural heritage.¹³ This focus is not surprising, as structures often form the most obvious historical-material remains in the landscape. They were also often the inspiration for new buildings, as exemplified by Robert Billings' popularisation of 'Scottish Baronial' architecture through his volumes of illustrations of Scotland's medieval and renaissance period castles, churches, and architectural details.¹⁴ Thus, the earliest detailed architectural analysis of historic buildings, commencing in the mid-nineteenth century, was undertaken by architects and engineers. This analytical and descriptive tradition included detailed measured drawings of the exteriors of the structure, such as that of Billings and those by MacGibbon and Ross. This tradition continues today with attempts to render 3D models of structure.¹⁵ MacGibbon and Ross were the first to attempt a comprehensive survey of Scottish castellated architecture, producing drawings of the exteriors of historic buildings with specific details of windows,

¹³ N. Andres and F.B. Pozuelo, 'Evolution of the Architectural and Heritage Representation', *Landscape and Urban Planning*, 91 (2009), p. 105.

¹⁴ R.W. Billings, *Baronial and ecclesiastical antiquities of Scotland* (Edinburgh, 1845).

¹⁵ A. Hale and J. Hopher, '3D Data Fusion for the Presentation of Archaeological Landscapes: A Scottish Perspective', (2008), < http://archiv.ub.uni-heidelberg.de/propylaeumdok/538/1/04_16_hale_et_al_rcahms3d.pdf>, p. 2. [Accessed 23 March, 2012]

doors, etc., while also providing plans of the footprint and interior layout. MacGibbon and Ross were both professional architects who used a combination of lines, measures, tapes, and grids to survey buildings under study.¹⁶ Modern technology has created new methods of structural survey, which can produce measurements to a high degree of accuracy within areas that were previously more difficult to reach or required more people to produce accurate measurements. The most basic of these new technologies is the laser, which was introduced to record distances and perhaps surface details in 2D format.¹⁷ Photogrammetry has developed more recently as a technique for measuring and recording a structure in 3D. Photogrammetric technologies have the potential to carry out infrared scanning, resistivity (which measures the electrical resistance in the various soils and objects within them), and geomagnetic survey to produce a high level of detail of a structure. Laser scanning has also been developed to produce a 3D image of the scanned object, allowing virtual assessment and manipulations.¹⁸ Although there are many new tools for recording heritage architecture, few have been used on the sites relevant to this project.

¹⁶ D. Walker, 'The Architecture of MacGibbon and Ross: The Background to the Books', in D. Breeze (ed.), *Studies in Scottish Antiquity* (Edinburgh, 1984), p. 391.

¹⁷ D. M. Barber, W. A. D. Ross, and J. P. Mills, 'Laser Scanning for Architectural Conservation', *Journal of Architectural Conservation*, 12 (2006), pp. 35-36.

¹⁸ N. Brown, R. Laing, and J. Scott, 'The Doocots of Aberdeenshire: An Application of 3D Scanning Technology in the Built Heritage', *Journal of Building Appraisal*, 4 (2009), p. 247.

A.3.2.b: Resistivity

Similarly to the new technologies used to record architecture, archaeological methodologies for identifying areas with surviving physical remains have developed considerably in recent decades. These methodologies were developed as non-invasive techniques to find surviving material under the soil surface. Terrestrial laser scanners, geomagnetometry, and resistivity are able to produce highly detailed images of surface or buried landscape features.¹⁹ In some cases, they can create images of clearly identifiable outlines of buried structural remains. In the future, they will also be used to entirely replace excavation in places where digging might cause more harm or too much disruption than is necessary. In other cases, these approaches can be used to identify target areas for the more effective planning of excavations. However, these methods do not always reveal any conclusive details about the site contents and digging is still required to identify the fine details of the site. It is also the case that many of the programmes for archaeological survey did not have the funding for non-invasive surveys and, as a result, ‘traditional’ methods continue to be used. In the case of Melgund, the choice to restore the building to a habitable state resulted in significant archaeological investigations, including resistivity surveys in 1990. The resistivity was focused on finding the remains of the surrounding barmkin; however, this survey revealed no conclusive evidence for the existence of such a wall.²⁰ It did suggest, however, that the location of the main access way and entrance to the site had been changed, which was confirmed by excavations that exposed the

¹⁹ J.A. Entwistle, K. J. W. McCaffrey, and P. W. Abrahams, ‘Three-Dimensional (3D) Visualisation: The Application of Terrestrial Laser Scanning in the Investigation of Historical Scottish Farming Townships’, *Journal of Archaeological Science*, 36 (2009), p. 862.

²⁰ R. Cachart, ‘Survey’, *Discovery and Excavation in Scotland* (1990), p. 40.

remains of a metalled road.²¹ At Red Castle in 1983, resistivity surveying revealed ditches running closely to the known curtain wall of the castle. The ditches were excavated and dated as early medieval features.²² At Glamis, however, the resistivity survey of the gardens revealed many identifiable features that were part of a previous phase of out-buildings in the garden and revealed that there had been a change in the approach to the area.²³ Unfortunately, data gathered from these studies does not fit within the time frame of this study.

A.3.2.c: Aerial Survey

It is through aerial survey that most of the identification of underground architectural remains has been made. Although the extensive use of aerial survey in archaeological study has been expanded by the modern technological development of air travel and the advancement of photographic technology, its origin did not wait for reliable air travel to be invented. In fact, archaeological features were first identified from the air from a hot-air balloon in Paris in 1885 and other early methods of aerial recording experimented with attaching cameras to pigeons, kites, and rockets.²⁴ These technologies developed over time, driven by needs that were not archaeological in nature, and have become established and regular tools for assessing historic sites.

²¹ J. Lewis, 'Melgund Castle (Aberlemno parish)', *Discovery and Excavation in Scotland* (1990), p. 40.

²² Gibson and Pollock, D and A, 'Red Castle (Inverkeilor p): ditches', *Discovery and Excavation in Scotland* (1983), p. 34.

²³ M. R. Apter, 'The building and other works of Patrick, 1st Earl of Strathmore at Glamis, 1651-1695', *Antiquities Journal*, 66 (1986), p. 110.

²⁴ G. J. J. Verhoeven, 'Providing an Archaeological Bird's-eye view-an Overall Picture of Ground-Based Means in Execute Low-Altitude Aerial Photography (LAAP) in Archaeology', *Archaeology Prospection*, 16 (2009), p. 233-235.

Aerial photographs taken during military reconnaissance in World War I were the original images used in this method for archaeological site assessment. The archaeology officer of the O.S., O.G.S. Crawford used his training from the First World War Royal Flying Corps to bring the use of aerial photography into common archaeological practice.²⁵ These early photographs were invaluable and, as archaeological studies advanced in the twentieth century, archaeological survey organisations, like the RCAHMS, have developed their own programmes for aerial reconnaissance, including low altitude photography from kites and drones as well as airplane and helicopter, to gain information for specific sites of historical interest.²⁶ This method often included schemes for surveying these sites through different seasons, climatic changes and lighting variations.

Although the first sites identified through aerial photography were earthworks, cropmarks were quickly recognised as revealing significant details of subterranean soil disruptions, such as previous building and wall outlines and previous rig and furrow farming.²⁷ The recognition of the sites, however, is often dependant on many factors. Different colours within the ripened crop are a result of drier or wetter soil conditions. The saturation of the soil can also result in the different crop height, causing shadows. This soil variation could be the result of many factors, such as the

²⁵ M. Barber, *A History of Aerial Photography and Archaeology: Mata Hari's Glass Eye and Other Stories* (Swindon, 2011), p. 93.

²⁶ Verhoeven, 'Providing an Archaeological', p. 242.

²⁷ N. Brown, R. Laing, and J. Scott, 'The Doocots of Aberdeenshire: An Application of 3D Scanning Technology in the Built Heritage', *Journal of Building Appraisal*, 4 (2009), 236-237.

accumulation of stones from buried structures or water retention in in-filled ditches.²⁸ Archaeological understanding of areas like Angus continues to develop as the images from satellites and remote sensing techniques, particularly those recently declassified, are used in specialist analysis of the areas of study.²⁹ Although some have suggested that aerial site identification produces only a partial record of a historic landscape overlain with more detail of modern agricultural land use, it allows for the emergence of some patterns of ancient landscape use.³⁰ The future use of these methods might further uncover physical arrangements of medieval and early modern noble residences and their landscapes but not much has been revealed at the present date. What has been found, though contributes to an understanding of the complexity of the environment in late fifteenth and early sixteenth century Angus.

Many sites that are no longer physically present have been identified through aerial photography. For example, Claverhouse Castle was torn down in the early nineteenth century but it is possible that the outline of its enclosure can be identified from the RAF aerial survey photographs taken in 1947.³¹ Studying aerial images of the site of Castleton of Eassie, occupied nowadays by a farmhouse and steading, reveals the outlines of several earthwork features, including a motte potentially marking the site of Sir John Graham's castle. The summit area of the rectangular mound that may

²⁸ D. C. Cowley and K. Brophy, 'In with the New, Out with the Old? Auto-Extraction for Remote Sensing Archaeology', *SPIE Remote Sensing. International Society for Optics and Photonics* (2012), p. 42.

²⁹ M. J. Fowler, 'Archaeology Through the Keyhole: The Serendipity Effect of Aerial Reconnaissance Revisited', *Interdisciplinary Science Reviews*, 29 (2004), p. 121.

³⁰ T. Allen, G. Hey, and D. Miles, 'A Line of Time: Approaches to Archaeology in the Upper and Middle Thames Valley, England', *World Archaeology*, 29 (1997), p. 116.

³¹ Royal Air Force photograph collection, CPE/SCOT/UK/303, 1947.

constitute the motte measured 89-metres by 67-metres with a 15-metre wide ditch to the east.³² Crop marks identified rectangular and circular forms, also part of the site. Structural remains of Kinnell Castle had also disappeared by the time the archaeological data was recorded systematically, although the local antiquarian Warden stated that some of the walls were still standing in 1885. Aerial surveys undertaken in 1990 by the RCAHMS revealed the outline of a rectangular form, presumably the site of the castle.

Another great advantage of the aerial survey and cropmark detection was in identifying the location of some medieval settlements, and possibly earlier ones. These were important features of the landscape surrounding the castle; and interactions here between the castle and settlement were key to understanding the wider social, political and economic interactions within these communities. The tenorial associations between these settlements and the lords of the castle, and the settlements proximity to the structure, or some gathering point for legal or economic purposes like the mill, were the connections that drove the networks of the medieval landscape. Medieval settlement sites within the property of the castles, revealed through aerial reconnaissance, helped map the connectivity of these places. North-west of Kinnaird Castle, the outline of unenclosed settlement became evident, along with some ring ditches and rig and furrow.³³ The 1982 aerial survey shows other

³² Royal Commission survey accounts, 'The archaeological sites and monuments of central Angus, 2 (medieval and later), Angus District, Tayside Region', *The Archaeological Sites and Monuments of Scotland Series*, 22 (1984), p. 12.

³³ The Royal Commission on the Ancient and Historical Monuments of Scotland, 'The Archaeological Sites and Monuments of Central Angus, Angus District, Tayside Region', *The Archaeological Sites and Monuments of Scotland Series*, 18 (1983), p. 36.

indications of unenclosed settlement to the west of Dun.³⁴ To the north-east of Dun, more settlement patterns have been identified at Broomley.³⁵ North-west of Brechin, more unenclosed settlement at Blackhall and evidence of medieval farming activity were indicated by an aerial survey undertaken in 1992.³⁶ There are circular cropmarks (probably round houses from 500AD) that are 17 meters in diameter at the Boysack site.³⁷ From the 1990 survey, there was cropmark evidence of unenclosed settlement near, if not within, the grounds of Careston Castle.³⁸ A medieval farm settlement near Kinnell, at Balneaves Cottages, was revealed through a survey done in 2000 and again in 2010.³⁹ Each of these discoveries contributes to our understanding of past land-use within Angus, confirming the existence of rural activity, although they are not necessarily useful for spatial analysis at this stage.

Aerial surveys also help identify features that were never structurally related but are, instead, indicative of previous land use. Medieval structural presence, whether castellated or not, demanded economic extraction from the landscape. The type of environmental exploitation was tied to the nature of nearby landscapes; a new network of connections developed around the proximity of the environment needed for subsistence and economic demands. Aerial photography has identified medieval rig and furrow in many places, which provides confirmed points of arable exploitation. This, in turn, allows for the identification of the other areas of known

³⁴ Angus SMR, NO65NE0041, Balwyllo.

³⁵ Angus SMR, NO65NE0040, Broomley.

³⁶ Angus SMR, NO56SE0070, Blackhall.

³⁷ Angus SMR, NO64NW0040, Boysack.

³⁸ Angus SMR, NO56SW0029, Careston Castle.

³⁹ Angus SMR, NO64NW0052, Balneaves Cottages.

non-arable exploitation. The close proximity of the structures to arable land was demonstrated in several locations. The rig and furrow marks identified as Balcathie were close to the property associated with Kellie Castle. Other medieval rig and furrow marks remain evident at Balfour, Boysack, Eassie, and Nether Kellie, among others. Although the identified medieval rig and furrow did not often cover extensive areas of land, their marked existence exemplifies the complexity of the surrounding landscape of noble residences.

Another key element of the landscapes of lordship was the connection between the sites which were built and older representations of power attached to that location. These are sometimes known through local history and can be identified through landscape survey or other survey methods and excavation: for example, the probably late twelfth- or early thirteenth century motte at Edzell is .3-kilometres away from the new castle structure and close to the medieval church. The first edition O.S. placed the motte and the new castle as separated by a wall, though a gate was nearby.

⁴⁰ Inverquharity was next to, and with its enclosing grounds covering, a Roman camp and fort. It was partly excavated in 1984⁴¹ and a resistivity survey made in 2002 clearly revealed outlines of the camp and the neighbouring site.⁴² Other sites are known to have been built on top of earlier structures but these clearly demonstrated accessible connections to previous site inhabitation.

⁴⁰ W. D. Simpson, 'Edzell Castle', *Proceedings of the Society of Antiquaries of Scotland*, 65 (1931), pp. 119-120.

⁴¹ G.S. Maxwell, 'Inverquharity (Kirriemuir Parish), Roman Fort and Temporary Camp', *Discovery and Excavations in Scotland*, 35 (1984).

⁴² D. J. Wooliscroft, 'Inverquharity, Angus (Kirriemuir parish), souterrain; settlement; Roman fortlet; Roman camp', *Discovery and Excavations in Scotland*, 3, (2002), p. 13.

MacGibbon and Ross's contributions to the study of castellated and ecclesiastical architecture in Scotland were the foundation for studying the broader spectrum of architectural history in the nineteenth century. As explained by MacGibbon and Ross, their published work contained plans and sketches in order to visually support their programme for the systematic assessment of Scottish domestic architecture. In addition to the sketches, their work includes a textual discussion of the features. The authors committed themselves 'to trace the development of the Architecture, and to determine the stages of progress or "Periods" into which it naturally divides itself.'⁴³ Their determination to place these structures within strictly defined periods of development created many problems. In many cases, the drawings themselves were based on conjecture rather than precise methodological survey. In this project, these limitations were recognised and controlled by consulting the data from later surveys when possible, although some site descriptions in this dataset rely heavily on MacGibbon and Ross' information. In such instances it is important to be aware of the potential drawbacks of the source. Nevertheless, the material found in MacGibbon and Ross's collection provided an excellent initial framework for adding the physical specifications of most of the sites in this study.

The MacGibbon and Ross's plans were of great value when there was a lack of recent survey work on the architecture of a building or, at least, nothing that had produced a structural plan. For places which were significantly ruined or had been closed to work or to the public, such as Affleck Castle, any depiction of the interior of the structure or the layout of the features around the building was taken from MacGibbon and Ross's plans. In many cases, exterior depictions have been written

⁴³ MacGibbon and Ross, *Castellated and Domestic Architecture*, Vol 1, p. vi.

and drawn by Tranter,⁴⁴ though MacGibbon and Ross remain the main source for interior plans. MacGibbon and Ross, however, did not always provide a plan for the structures being studied for this project. Kellie Castle, for example, is one structure where exterior drawings had been provided by MacGibbon and Ross⁴⁵ and Tranter⁴⁶ but it was only later surveys relating to renovations in 2008 which provided more details of the structural layout.⁴⁷ The discursive information of this survey lacks data that could be clearly connected to the early stages of the structure, invalidating the use of this site in the stages of analysis in Section B.

Much of archaeological survey data discussed above has provided information about the complex makeup of the historical landscape of Angus but has not clearly identified the noble residences used in this study. The most useful information about noble residences for this study has been gained from architectural description and surveys, along with twentieth century excavations of the sites. The sites discussed below have been included in this study because it is possible to identify late fifteenth and early sixteenth century attributes in them. Not all noble residences have a remaining archaeological presence, creating major challenges for their use in spatial analysis. To resolve this issue, further assessment was done through network analysis in chapter seven. However, the physical remains, such as they are, are discussed below under the categories of non-substantial, limited, and substantial.

⁴⁴ Tranter, *Fortified House in Scotland*, vol 4, p.128.

⁴⁵ MacGibbon and Ross, *Castellated and Domestic Architecture*, Vol 3, p. 599.

⁴⁶ Tranter, *Fortified House in Scotland*, vol 4, p. 134.

⁴⁷ Lilley and Sproat, "Kellie Castle, Angus (Airlot parish), historic building recording and watching brief", *Discovery and Excavation in Scotland*, 10 (2009), p. 30.

A.3.3: Non-substantial Archaeological Remains

A.3.3.a: Airlie

Airlie Castle was built near the confluence of the River Isla and the Melgam Water. At the base of the promontory between these two waters is a deep ditch 6.0-metres to 9.0-metres wide. Along the interior of this ditch is the eastern section of the curtain wall, 36.5-metres long and 10.0-metres tall with a 3.0-metres thickness.⁴⁸ Due to the castle being burnt by Argyll in 1640 and rebuilt in 1792-3, this wall is the only remaining structure of the original castle built in 1432.

A.3.3.b: Aldbar

The site of Aldbar Castle is near a small stream coming off the River South Esk, near the current woodland known as the Den of Aldbar. Nothing remains of the original structure of Aldbar, though the demolition of the tower only occurred in 1964. Tranter describes it as a four storey red sand stone tower, with a stair in the re-entrant angle. Two corbeled turrets were in the western corners of the tower, though these might have been later additions. The original entrance of the tower was in the western side, though this has been covered up by later Gothic developments, leaving the new entrance in the east. Although the eastern chimneys were modern additions, the southern chimney was interpreted as part of the original structure.⁴⁹ Most of the

⁴⁸ MacGibbon and Ross, *Castellate and Domestic Architecture*, Vol 5, p. 216.

⁴⁹ Tranter, *Fortified House of Scotland*, Vol 4, p. 97.

interior had been altered during the nineteenth century.⁵⁰ The owner of the property suggested to an Ordnance Survey team that the tower was built around 1540.⁵¹ Unfortunately, no known full architectural survey was made of the structure before it was demolished by the owner in the mid twentieth century. The closest is the 1861 O.S. map published in 1865, which outlines the structure of the Aldbar but does not distinguish the older parts from the newer.⁵²

A.3.3.c: Auchterhouse

The probable remains of the early castle at Auchterhouse is a tower just above the Auchterhouse Burn called Wallace Tower. Warden describes it as having a wall 2.7-metres thick standing 3.6-metres high in 1865. The interior of the tower measures 6.0-metres by 4.6-metres and had an arched door way in the north wall.⁵³ The remains of this tower are in a similar condition today, though no survey has been done of it.

⁵⁰ Jervise, *Memorials of Scotland*, p. 303.

⁵¹ Ordnance Survey, 1958.

⁵² Ordnance Survey, Forfar Sheet XXXIII.4 (Aberlemno), 1865.

⁵³ Warden, *Angus or Forfarshire*, vol. 2, p. 385-86.

A.3.3.d: Baikie

There are no current remains of Baikie Castle and any remaining foundation material appears to have been removed from the site before 1865. It was situated on the elevated bit of land in the middle of Baikie Loch, which was systematically drained in the mid-eighteenth century, on Baikie Burn, north-west of the River Isla. The *Old Statistical Account* describes the structure as having walls eight feet thick but having a rather small house.⁵⁴ Access to the castle was through a causeway, also removed, leading to a gate assumed to be on the west side. Jervise's account noted that evidence of the structure and causeway had been removed by 1865 but he remembered there being enough of the north-east walls to suggest a square structure with very thick walls.⁵⁵ Wilson provides much more detail, stating that within the walls were two buildings sitting at right angles to each other with turrets at the corners. Wilson also described Baikie as having a range of buildings along the north and south walls, with a well in the centre of the courtyard and a chapel in the south-west corner.⁵⁶ The suggestion that Baikie Castle was a rather small noble residence does not really fit with Pont's representation of the structure but, without further archaeological evidence, it is hard to determine the site's layout or elements of timber construction.

⁵⁴ *Old Statistical Account of Scotland*, vol 11, p. 212.

⁵⁵ A. Jervise 'Notice of antiquities in the parish of Airlie, Forfarshire', *Proc Soc Antiq Scot*, 5 (1865), pp. 347-8.

⁵⁶ W. Wilson, *Airlie: a Parish History* (Coatbridge, 1917), pp. 30-35.

A.3.3.e: Bonnyton

Whatever appeared to remain of the Bonnyton Castle in the early nineteenth century was gone by 1860; it is thought to have fallen down in 1785. Supposedly, the foundations of the castle and a moat were present in 1833 but no description of the shape or any other details were made at this time.⁵⁷ Warden notes that there were two engraved panels built in the walls of neighbouring farm buildings dated 1666, the date the property was elevated to a barony.⁵⁸ It was therefore thought that a structure was built at that time; however, given that it was documented as a significant structure much earlier to this,⁵⁹ it is more likely that the structure was renovated or altered at this time. An O.S. team visited the site in 1958, where they noted the panel was actually dated 1607 rather than 1666. The location of the castle was interpreted as being on some high ground near the cottage. A 1.5-metre to 2-metres scarp runs about 75-metres on the north side and a small stretch along the south side. A ditch 0.5-metre deep and 4.5-metres wide sits to the south-east but the O.S. team believed it to be an irrigation ditch rather than part of the supposed moat at this site. The site includes the ruins of a possible seventeenth century dove-cot but no other indications of the surrounding lordly landscape remain.⁶⁰

⁵⁷ New Statistical Account of Scotland, vol. 11, pp. 116-117.

⁵⁸ Warden, *Angus or Forfarshire*, vol. 4, p. 311.

⁵⁹ See Chapter Five and Appendix A. p. 350.

⁶⁰ Ordnance Survey, *Name Book, Book 68* (1791), p. 14.

A.3.3.f: Brechin

Brechin Castle is situated on the banks of a curve in the River South Esk. Tranter notes that Brechin Castle was so altered by later developments that nothing from the earlier phases could be identified, although fortifications have been present from at least the twelfth century.⁶¹ The south-east kitchen block has the date 1703 marked on an internal lintel, suggesting that what currently stands was built within the first fifteen years of the eighteenth century.⁶² Jervise, however, states that construction at this point made additions to a previous structure, suggesting that there may be some remains of an earlier structure within the current structure, such as at Glamis.⁶³ Without further extensive investigation, nothing more than the site on which the present castle stands can be connected to earlier forms of the noble residence.

A.3.3.g: Dudhope

Dudhope Castle is situated near Dundee Law and was the seat of the constables of Dundee from the thirteenth until the seventeenth centuries. Writing in 1895, local antiquarian Lamb suggested that the thirteenth century structure was rebuilt in the middle of the fifteenth century and again in the early seventeenth century into what is currently standing on the site.⁶⁴ However, the drawings of Dundee by John Slezer in the late sixteenth and early seventeenth century show the fifteenth-century tower still

⁶¹ Tranter, *Fortified House of Scotland*, Vol. 4, p. 172.

⁶² J. Wood, *Description of Atlas of principal towns of Scotland* (1828), p. 58.

⁶³ Jervise, *Memorials of Angus and the Mearns*, pp. 125-127.

⁶⁴ A. Lamb, *Dundee: Its Quaint and Historic Buildings* (Petrie, 1895), p. 10..

there in the north end of the east quarter, suggesting the current form might be slightly later. The image shows a quadrangular tower with parapet and a cap-house, though other details are obscured by trees.⁶⁵ Tranter suggests that the original tower was an oblong shape with an added extension likely following the current line of the building.⁶⁶ The current structure forms two sides of courtyard 38.1-metres by 36.6-metres and is now four storeys high, though originally only three with a dormer-windowed garret. It is likely that it incorporates some of the earlier tower at the NE corner of its current form; however, excavations as a response to environmental improvements in the 1990s did not reveal any definite evidence for the foundations of earlier buildings.⁶⁷ The seventeenth century structure was converted into a woollen mill in the late eighteenth century and was later used as a barracks.⁶⁸

A.3.3.h: Dun

The location of Dun Castle is within the gardens of Dun, but there are no remains of the structure and there have not been since well before the mid-eighteenth century.⁶⁹ The 1858 version of the Ordnance Survey Name Book states that the serving ice house was part of the castle, but that interpretation has been rescinded.⁷⁰ Jervise also

⁶⁵ J. Sleezer, 'Theatrum Scotiae', (1693), plate 39.

⁶⁶ Tranter, *The Fortified House in Scotland, Vol 4*, p. 112-114.

⁶⁷ S. T. Driscoll, 'Excavations on Dundee Law, 1993', *Proc Soc Antiq Scot*, 125 (1995), p. 1106.

⁶⁸ MacGibbon and Ross, *Castellated and Domestic Architecture, Vol 4.*, pp. 270-275.

⁶⁹ Warden, *Angus or Forfarshire, Vol 3*, p.169.

⁷⁰ Ordnance Survey, *Name Book, Book 17*, p. 12.

thought that the arched gateway was a relic of the early sixteenth century but modern interpretation suggests a post sixteenth century origin.⁷¹

A.3.3.i: Downie

The site of Downie Castle is on what is known as Castle Hill near Old Downie farm, just north of the Pitairlie Burn. It is a 3.0-metres high hill measuring 15.0-metres by 12.0-metres.⁷² There is some confusion as to the point at which any remains were visible of the site. Jervise in 1853 and the Ordnance Survey Name Book in 1858 indicate that there was no evidence of the structure.⁷³ However, in 1884, Warden stated that the foundations could still be seen on the hill.⁷⁴ Some remains of a possible dry stone wall at the base of the hill were identified in 1958.⁷⁵ Regardless, no description of what the castle might have looked like was made, so no more can be said about the contents of the structure.

A.3.3.j: Easter-Denoon

There is unfortunately no architectural evidence left for Denoon Castle, also known as Easter-Denoon. Although the site is identified by the Royal Commission on the

⁷¹ Jervise, *History and Traditions*, p. 18.

⁷² Ordnance Survey, 1958.

⁷³ Ordnance Survey, *Name Book, Book No.71*, p. 80.; Jervise, *History and Traditions*, p. 306.

⁷⁴ Warden, *Angus or Forfarshire, Vol 4*, p. 421.

⁷⁵ Ordnance Survey Visit, 1958.

Ancient and Historical Monuments of Scotland, any remaining structure was removed and used in the construction of the surrounding buildings before the mid nineteenth century.⁷⁶

A.3.3.k: Fithie

Both Warden and Jervise suggest that what little remains of Fithie Castle forms the eastern section of wall of a cottage.⁷⁷ The O.S. Name Book notes that the material of the wall does come from a medieval structure but was most likely robbed from the site rather than an actual piece of the castle wall.⁷⁸ This was confirmed by the RCAHMS in 1978.⁷⁹ The cottage has since been destroyed, with one stone with a pentangle mason mark moved to Kinnaird Castle.⁸⁰

⁷⁶ Ordnance Survey, *Name Book, Book No. 45*, p. 56.

⁷⁷ Jervise, *History and Traditions, Vol 1*, p. 86; Warden, *Angus of Forfarshire, Vol. 3*, p. 247.

⁷⁸ Ordnance Survey, *Name Book, Book No. 41*, p. 45.

⁷⁹ The Royal Commission on the Ancient and Historical Monuments of Scotland., 'The Archaeological Sites and Monuments of Lunan Valley, Montrose Basin, Angus District, Tayside Region', *The Archaeological Sites and Monuments of Scotland Series, 4* (1978), p. 31.

⁸⁰ Mason Mark Project, <
<http://www.masonsmarkproject.org.uk/displaymarks.aspx?CanmoreId=35861>>. [Accessed 02 May 2014]

A.3.3.l: Inverarity

Though there was late fifteenth- and early sixteenth-century documentation of a noble residence at Inverarity, no knowledge of this site has been retained and no archaeological studies have been undertaken to further identify it.

A.3.3.m: Panmure

A structure at Panmure on the high promontory over the Monikie Burn purportedly existed from the early twelfth century. It was destroyed, possibly in the early fourteenth century, and rebuilt again in the late fifteenth century. New works, a hall, and a round tower at the north-west corner were added after the battle of Flodden in 1513. The current remains of Panmure are heavily over-grown and deteriorating. Excavations in 1881 revealed a rhomboid structure with towers projecting out of the walls at each corner. The north-west tower was 11.3-metres square, the north-east 7.3-metres square, and both southern towers were 7.3-metres by 8.2-metres. At the time of the 1881 excavation, the walls stood at a height between 0.8-metres and 2.0-metres with a thickness of 1.5-metres to 2.0-metres. The foundations of the rest of the buildings inside the walls stood at a height of 1.2-metres, with a well within the courtyard.⁸¹ To the north there is a rampart 16-metres wide with a height of 3.0-metres to 5.0-metres, which is a barrier to a large water filled moat. There is a narrow

⁸¹ A. H. Millar, *The Historical Castles and Mansions of Scotland: Perthshire and Forfarshire* (Pailsey, 1890), p. 278-284.

terrace that provides access from the rampart to the castle; however, much of the landscape has been greatly obscured by the wood.⁸²

A.3.4: Limited Archaeological Remains

A.3.4.a: Broughty

The location of Broughty at the mouth of the River Tay has made it a very important site for some time. A castle was said to have been there from the mid fifteenth century but there is evidence of an earlier presence of fortification. Plans for new features, if not an entirely new structure, were underway by the 1490s, suggesting that the structure present in 1454 was much older than that. By the nineteenth century, the structure was in ruin. There are a few surviving images of the structure in ruin before it was renovated in the late nineteenth century. An engraving by Nasymth in 1807 shows a roofless tower with most of the wall and surviving indications of round towers at the corners of the curtain wall.⁸³ These features were also present in an image from 1822 and photographs taken just before the reconstruction in the 1860s. In 1855, Broughty was bought by the British government in order to boost the coastal defences for the Crimean War; however, no construction actually took place at this time. Robert Rowand Anderson⁸⁴ was tasked with renovations in 1860-61, which resulted in most of the curtain wall being

⁸² N. Hynd, 'Towards a study of gardening in Scotland from the 16th to the 18th centuries', in D. J. Breeze, *Studies in Scottish antiquity presented to Stewart Cruden* (Edinburgh, 1984), p. 283.

⁸³ Nasymth, 'Broughty Castle: View From N. W.' (Engraving, 1807) as in F. Mundie, D. Walker, and Iain MacIvor, *Broughty Castle and the Defence of the Tay* (Dundee, 1970), plate 2.

⁸⁴ Nineteenth century architect. For further information see: S. McKinstry, *Rowand Anderson: The Premier Architect of Scotland* (Edinburgh, 1991).

destroyed along with major changes to the tower. Despite these renovations, there is still some evidence of the previous, older structure which has been identified by Walker.⁸⁵ The ground floor consisted of two store rooms, divided with a double vault. The entrance to this floor appears to have been near the stair. There appears to be two stairs from ground level to the first floor, one in the south-west corner and one in the north-west corner, though the main entrance was probably through the south. The first floor would have had four windows in each of the walls, though the western window is now a doorway providing access to the nineteenth century addition and the other windows are likely to have been at least enlarged. There is a wall chamber in the south-east corner and what Walker interprets as a fireplace in the east wall, though it might be a garderobe. Access from the first floor to the floors above is only achieved through the south-western stair. The second level has three windows, the northern one inserted by Anderson, and a fireplace in the eastern wall. There were also two small chambers in the western wall, one of which has been used for the access to the new stair. The third floor has three windows in the east wall and one later insertion window in the northern wall. All of the corbels, except those on the west wall, are original. Not much is known about the wall, except the general foundation line it would have followed. A source from 1547 states that the wall was 4.3-metres high facing land and 2.7-metres high facing the sea, though there is no way to confirm this.

⁸⁵ F. Mundie, D. Walker, and Iain MacIvor, *Broughty Castle and the Defence of the Tay* (Dundee, 1970), pp. 70-75.

A.3.4.b: Glamis

The present structure of Glamis Castle was built around the early fifteenth century tower. It has undergone many phases of construction (1606-26, 1669-90, 1770-6, 1790-1800, 1850-60, and 1891),⁸⁶ creating new buildings, access routes and renovating the older structures. For this reason, not much of the early fifteenth-century tower is readily apparent, though removing the later interiors would likely reveal much more of the earlier structure. The main tower sits at 21.6-metres by 11.5-metres with a protruding wing to the south-east of the main tower measuring 8.9-metres by 6.4-metres. The walls were 3.0-metres thick, rising four stories high.⁸⁷ The south-east corner of the wing has a round tower that is 7.6-metres in diameter. In the north-east wall of the wing is about 6.1-metre of curtain wall that has been incorporated into the building structure with a barrel vaulted cellar. The ground floor of the main tower consisted of three barrel vaults. On the inside, the first floor is estimated to measure 15.24-metres by 6.71-metres but a west chamber chimney fully covers that end of the hall. A fireplace stood at either end of this floor, which has commonly been described as a laigh hall. The second floor, which is interpreted as the great hall, is thought to have had a fireplace at either end, along with a large fireplace in the south wall.

⁸⁶ For a depiction of the phases of development see H. G. Slade, *Glamis Castle* (London, 2000), p. 3 and Appendix A, p. 418.

⁸⁷ MacGibbon and Ross, *Castellated and Domestic Architecture*, Vol. 2, p. 114.

A.3.4.c: Redcastle

The site of Redcastle, which lies on a promontory in the Lunan Bay with the Lunan Water to the north and the ocean on the east, has had a noble residence on it since the twelfth century. The main remains of Redcastle consist of the curtain wall along the west, with some remaining on the north, along with the northern wall of a tower. The wall runs 32-metre long, 6-metre high, and 2-metre thick and is constructed with irregular dressed local sandstone, a significantly different form of construction from the tower. The parapet remains evident in the wall and at the level of 4.3-metre on the interior of the west side, the facing becomes more regular with evidence of a fireplace around the midway point of the wall, indicating the presence of a structure built against this section. Although there is no direct evidence of a particular date the curtain wall was built, Simpson suggests that it could originate from the thirteenth century.

The tower is free standing in the north-west corner and measures 13.4-metres by 10-metres with 1.6-metres thick walls and is generally interpreted as fifteenth-century. The north wall remains; the east and west walls partially survive. It has been constructed with sandstone ashlar with evident joist holes for floors. There are fireplaces in the north wall on the first and third floors, the first floor fireplace being large enough to suggest the use of this floor as a hall, and a garderobe on the second floor. There is a large window with possible window seats in the east walls on both the first and second floors. The west wall shows a fireplace at the second floor level and a large window on the third floor. Around the top of the remaining walls of the

tower are double filleted corbels.⁸⁸ Excavations of the kitchen midden revealed several species of shells and post-medieval pottery and bones.⁸⁹ In 1983, an excavation revealed a ditch running along the outside of the curtain wall with twelfth or thirteenth century origins.⁹⁰

A.3.5: Substantial Archaeological Remains

A.3.5.a: Affleck

Affleck castle is generally interpreted as being a construction of the late fifteenth century and is situated between the Monikie Burn and Pitairlie Burn. The remains of this noble residence consist mainly of the tower, which has led to the site being interpreted as a free-standing tower made of coursed rubble.⁹¹ The tower measures 11.4-metres by 8-metres. It is mostly square, with a slight projection for the stair on the south-east corner. The height to the parapet is 15.7-metres and the total height 18-metres. A vault 6-metres high supports the hall on the second floor and is divided by the first floor. The ground floor is divided into two rooms but floors above all appear to be a single room measuring 8.1-metres by 4.9-metres. Access to the ground floor is made by a few steps leading into a small entrance chamber, which leads to the smaller of the two rooms with one slit window in the south wall. The larger of the

⁸⁸ W. D. Simpson, 'The Red Castle of Lunan Bay', *Proceeding of the Society of Antiquaries of Scotland*, 75 (1940), pp. 115-122.

⁸⁹ J R Sherriff, 'Red Castle (Inverkeilor Parish): Kitchen Midden', *Discovery and Excavation in Scotland* (1983), p. 35.

⁹⁰ A Gibson and D Pollock, 'Red Castle (Inverkeilor Parish): Ditches', *Discovery and Excavation in Scotland* (1983), p. 34.

⁹¹ Tranter, *Fortified House of Scotland, Vol. 4*, p. 93.

ground floor rooms is accessed through the smaller room and has slit windows on the north and west wall. The stair to the first floor is in the projection on the south-east corner and leads to the first floor, a room with windows with seats in the south, east, and west walls but no fireplace. Access to the second floor is also provided by the south-east corner stair. The second floor room has windows with seats in the south, east, and west walls and a fireplace in the north wall. A garderobe sits just off the entrance of the room in the south wall and a small closet in the wall to the right of the window in the west wall. The entrance stair ends at this level and all other access to the building is gained through a stair in the south-west corner. From the east wall of the second floor a 2.3-metres by 2.1-metres entresol room built in the space above the entrance stair is accessed via eleven small steps. It has two outside windows in the south and east walls, a spy window looking over the hall, and access to a garderobe built above the one below on the second floor. The third floor is accessed through the south-west stair and has seated windows in the south, east, and west walls. There is a fireplace in the east wall, two chambers in the corners of the north wall, and a garderobe in the south wall off the entrance to the room in the south-east stair tower space. This 2.2-metres by 2.0-metres room is a chapel, which has a circular vault 2.6-metres high with a window in the south. The top floor consist of a full wall walk around a garret room covered by the pitched roof, with chimneys coming up on the north and east walls. Two watch –towers were built over both stair cases. MacGibbon and Ross suggest that the parapet was not original and was, instead, added in the sixteenth century.⁹²

⁹² MacGibbon and Ross, *Castellated and Domestic Architecture, Vol. 1*, pp. 250-255.

A.3.5.b: Edzell

Edzell Castle is situated between the River North Esk and the West Water. Southwest of the current structural remains is the motte of the previous noble residence.⁹³ The motte is 38.1-metres in length and 15.8-metres wide. There are traces of the bailey which ran 91.4-metres around the motte, creating an area of 60.9-metres wide at its greatest point.⁹⁴ The main structure of the castle retains the late fifteenth- or early sixteenth-century tower made from coursed rubble, the renovations and additions from the 1580s, and the 1603 garden walls.⁹⁵ The tower is 13.4-metres by 10.3-metres and a total of 22.0-metres high, though only 16.5-metres to the parapet. The walls at ground level are 2.1-metres thick but are reduced to 1.7-metres at the first floor level. The entrance to this tower was near the re-entrance of the tower and leads into a small hall way leading to the stair with entrance to the two vaulted cellars, both approximately 5.7-metres by 4.3-metres. There are gun-ports in all the walls that let light into the cellar rooms. On the south side of the partition is a door providing access between the two rooms. In the north-east corner of the tower is a service stair leading up the hall on the first floor. The hall measures 10.0-metres by 7.2-metres and is 4.7-metres high. There are two windows in the south wall, with seats in the eastern most and one large window in the west wall. A fireplace is in the north wall measuring 2.1-metres across. Another smaller fireplace was in the east wall and joists in the north wall prove that a screen was in place reaching a height of 2.0-metres. A garderobe was situated in the east wall near the stair. In the north-west

⁹³ Tranter, *Fortified House in Scotland*, Vol. 4, p. 114.

⁹⁴ Simpson, 'Edzell Castle', pp. 119-120.

⁹⁵ MacGibbon and Ross, *Castellated and Domestic Architecture*, Vol. 1, p. 359.

corner of the hall within the north wall is a small chamber, 3.3-metres by 1.6-metres, with a window in the west wall. The floors above are interpreted as subdivided residential chambers due to the number and placement of fireplaces and garderobes.⁹⁶

A.3.5.c: Finavon

The area around Finavon Castle has a rich archaeological history. There is a vitrified fort on Finavon Hill, approximately 1.25-kilometres south-east of the old castle, which radio carbon dating suggests occupation between the seventh and fourth century B.C.E.⁹⁷ Approximately 800-metres north-west of the castle are the possible remains of a small Roman Fort, shown through aerial photography.⁹⁸

The site of the old Finavon Castle sits on the south bank of the Lemno Burn, approximately 400-metres up-stream from the burns confluence with the North Esk and approximately 140-metres east of the modern mansion. It has been a ruin since before 1750 and is currently a heavily overgrown wooded area. The lack of the south wall of the tower and many of the other structures is shown in the 1750 oil painting

⁹⁶ Simpson, 'Edzell Castle', pp. 124.

⁹⁷ C. Swift, 'Finavon Hill, near Forfar (Oathlaw parish), evaluation excavation', *Discovery and Excavation in Scotland*, (1997), p. 14.

⁹⁸ J. K. S. St Joseph, 'Air reconnaissance of Roman Scotland, 1939-75', *Glasgow Archaeology Journal*, 4 (1976), pp. 1-28.

of Finavon but the exact date of its fall is unknown.⁹⁹ Simpson suggests that it fell while still in use, as his excavation revealed a substantial amount of broken crockery, glass, and presumably full-before-broken wine bottles.¹⁰⁰ MacGibbon and Ross labelled it as being part of an L-Plan tower house, measuring the inside rooms of the remaining tower to be 4.87-metres square.¹⁰¹

Douglas Simpson, along with the Field School of Archaeology excavated the old castle, starting in 1952 and finishing in 1954. It was largely overgrown, during this time, and two old surviving lime trees deterred the team from doing a complete excavation of the foundations. The oldest part of the complex appeared to be a fourteenth century tower at the south side of the existing tower. This was measured at 17.37-metres by 10.16-metres, with walls 2.89-metres thick. The bottom floor of this tower contained a well, which was cleared to a depth of 10.13-metres, where oak boards were found under a about a meter of water.¹⁰² There appears to be a stair on the west side of the existing sixteenth century tower, leading fully to the top. The ground floor of the sixteenth-century tower was vaulted with an east-west alignment with three slit windows. A vaulted kitchen, aligned from north to south, was on the first floor with the fireplace in the north wall. The two rooms above each had a fireplace in the north wall, as well, and Simpson presumes the top floor had a fireplace in the wall which no longer exists.¹⁰³ There is a turret on the north-east

⁹⁹ Oil painting, 1750- end of W. D. Simpson, 'Finavon Caslte', *Proceeds of the Society of Antiquities of Scotland*, 89 (1956)p. 416.

¹⁰⁰ Simpson, 'Finavon Castle', p. 400.

¹⁰¹ MacGibbon and Ross, *Castellated and Domestic Architecture, Vol. 3*, p. 594.

¹⁰² Simpson, 'Finavon Castle', p. 404.

¹⁰³ *Ibid.*, p. 407.

corner of the tower and the large windows in the east wall were all fitted with glass on the upper window and shuttered on the bottom window with an iron grill.¹⁰⁴ A courtyard wall runs north from the north-west corner of the sixteenth century tower, heading west after approximately 13-metres. A two storey lean-to building also rested against the west wall at this corner. Foundations of other walls, coming off of the south-west corner of the fourteenth century tower, have also been discovered, along with a wall off the west end of the same tower. Each of these walls was fairly thin, the largest being approximately a meter thick.¹⁰⁵

There is not enough of the early structure or the restricted mid-twentieth century excavation to clearly identify any of the accommodation or service arrangements. It is clear that this property was quite large, in line with the status of its residence, but further excavation and investigation is needed in order to identify the function of the connected structures and how interaction between these spaces was arranged.

A.3.5.d: Inverquharity

Inverquharity is situated approximately 9-metres above the north bank of the Quharity Burn, approximately one kilometre up-stream from where the burn joins the River South Esk. The structure was built in the fifteenth century and originally included an east wing, which no longer existed by the time MacGibbon and Ross

¹⁰⁴ Ibid., p. 408.

¹⁰⁵ Ibid., pp. 408-409.

surveyed the property in the late nineteenth century. The existing tower measures 13.7-metres by 10-metres, with walls 2.28-metres thick. The main access stair leading up to the third floor is in the re-entrance angle of the east wall, where the north wall of the east wing joined with the tower. The tower has two vaults: the lower vaulted is separated by the first floor, and both rooms have narrow slight windows, the basement with one in the north and south walls, mirrored above with one additional window in the west wall. The room interpreted as the great hall is also vaulted at a height of 6.4-metres. The entrance to the hall is unique, as the top of the stair leads to a hallway that shifts the entrance into the room from the east to the north. There appears to be a small service hatch at the top of the stair connecting to the room in the east wing, suggesting that the kitchen might have been at this level within the wing. In the north-west corner there is an odd porch, from which a few stairs lead down to a small slit window. The purpose of this is unknown, as the space is quite small, but it does seem to suggest some altering of the floor level and, potentially, indicates access arrangements. There is a fire place in the south wall of the great tower, with great seated windows on either side in the east and west walls and a small window above the fireplace in the south wall. The floor above has two fire places, one in both the north and south wall, suggesting that this room was probably divided into two spaces by a screen. A small recess in the west wall probably served as a garderobe. Access to the cap-house is obtained through the wall walk on the outside of this level.¹⁰⁶

¹⁰⁶ MacGibbon and Ross, *Castellated and Domestic Architecture, Vol 3*, pp. 282-285.

The building has been adapted for modern living in the 1970s. Some excavations took place at this time, although they only revealed that a well existed in the basement floor of the east wing. There is also some archaeological history at this site, as there was a Roman camp about 750-metres away from the castle site.¹⁰⁷ The structure on the mill site originates from 1725 and is a two storey rubble building.¹⁰⁸

A.3.5.e: Melgund

The site of Melgund castle is along the Meglund Burn, south of the River South Esk. The castle was surveyed by MacGibbon and Ross in the nineteenth century and some archaeological excavation took place in the mid-1990s in preparation for modern renovations. It is an interesting mid-sixteenth century build, with a tower on the east end and a hall block that connected this tower to a shorter tower on the west end. The main tower is four stories high, with walls 1.8-metre thick, and is mostly square with a protrusion in the north-east corner of the tower for the stair. The entrance to this tower is in the stair tower from the eastern room, which was demolished by the time MacGibbon and Ross surveyed the property. The entrance leads down a corridor which forms part of a protrusion on the north wall of the tower and leads to two cellar rooms. The ground floor rooms of the hall block and other tower consisted of a kitchen, and four cellars.¹⁰⁹ These rooms were vaulted and measured a space of 10.8-

¹⁰⁷ G. S. Maxwell and D. R. Wilson, 'Air Reconnaissance in Roman Britain 1977-84', *Britannia*, 18 (1987), pp. 15-16.

¹⁰⁸ J. R. Hume, *The Industrial Archaeology of Scotland, 2, the Highlands and Islands* (London, 1977), p. 139.

¹⁰⁹ MacGibbon and Ross, *Castellated and Domestic Architecture, Vol. 4*, pp. 311-316.

metres by 6.6-metres. The kitchen fireplace was in the western wall 1.8-metres deep and 3.7-metres wide.¹¹⁰ The first floor of the tower was a private hall room, 7.4-metres by 5.9-metres, which is connected to the large hall in the block to the east. There are two large windows with seats on the south and west walls¹¹¹ and a small, 1.3-metre wide fireplace in the south-west corner.¹¹² Access to the main hall could be obtained through the main stair in the north-east or a connecting garderobe chamber in the south east. On the north wall is a garderobe and small chamber. The two chambers above this private room were presumed residential. The main hall is 11-metres by 6.2-metres with a fireplace in the west wall that connected the hall block and the tower, above the kitchen fireplace. The main fireplace sits along the north wall further east. There were three windows in the hall in the south wall: the two western-most windows were small and high in the wall and the eastern-most window was large. Access to the drawing room in the eastern small tower was through the north-eastern corner of the hall. The drawing room had a fireplace in the western wall and large windows with seats in the south and east walls. There is a stair on the north-east corner of this smaller tower with a round tower on the north-east corner of that, 3.6-metres in diameter with 1.0-metre thick walls.¹¹³ Between the stair on the west and the stair on the east, there appear to have been three chambers on the first floor level.¹¹⁴ Resistivity testing did not reveal any evidence of wall or barmkin to the north of the castle, though excavation revealed some evidence for a boundary

¹¹⁰ J. Lewis, 'Melgund Castle (Aberlemno Parish), Excavation', *Discovery and Excavation in Scotland* (1994), p. 80.

¹¹¹ MacGibbon and Ross *Castellated and Domestic Architecture, Vol. 4*, pp. 311-316.

¹¹² J. Lewis, 'Melgund Castle (Aberlemno Parish), Excavation', *Discovery and Excavation in Scotland* (1994), p. 80.

¹¹³ *Ibid.*

¹¹⁴ MacGibbon and Ross, *Castellated and Domestic Architecture, Vol. 4*, pp. 311-16.

wall, approximately 80-metres from the castle and 22-metres from the north-east corner, as traces of what may have been a barmkin.¹¹⁵

A.3.6: Implications for Assessments in Subsequent Chapters

The archaeological remains of the noble residences in this study have varied in site type as well as physical presence. Although many new technologies have arisen for the identification of archaeological remains, very few have been used to further develop our understanding of the noble residences within Angus. What has been done has either been very specific to certain features on the ground, such as at Melgund and Glamis, or has contributed to the general knowledge of historic land-use within the area. For this reason, this study has used mainly architectural descriptions and surveys with modern excavation reports to identify the physical nature of the noble residences, identifying the sites as objects. Stronger object descriptions were needed for the assessments in Chapters Five and Six. Chapter Five required the physical location of the structure to be identified, for which Airlie, Bonnyton, Broughty, Dun, Fithie, Melgund and Panmure were selected. Chapter Six, especially, required an understanding of the interior of the structure, limiting the available sites for assessment to Affleck, Broughty, Edzell, Glamis, Inverquharity, and Redcastle. However, much of the attribute information relates to site with very little archaeological survival, so Chapter Seven added Auchterhouse, Aldbar, Baikie, Brechin, Downie, Duhope, Easter-Denoon, and Inverarity to a network assessment. There are many more noble residence sites within Angus, though most no longer

¹¹⁵ J. Lewis, 'Melgund Castle (Aberlemno Parish), Excavation', *Discovery and Excavation in Scotland* (1996), p. 10.

contain physical remains from the time period of this study, or no documentation was found to indicate anything about the surrounding landscape. Within the archaeological data discussed in this chapter, each site has an established physical presence, however vague, which helps establish the noble residence as an object within this dataset.

Chapter 4: Attributes in Documentary Evidence

An *Object ID* signifies what is being displayed within a geospatial system, while the *attribute* describes the object. The attribute can take many forms of categorisation, but is purposed in this project to list the object's qualities.¹ Cumulatively, these qualities describe each object as a system of different aspects that allow the dataset to be assessed on multiple levels, from assessing the arrangement of one single system to how that arrangement compares to the other systems within the dataset. This study is concerned with the attributes of the noble residences and it is through the descriptive documents related to these properties that these attributes can be identified.

Writing in 1882, Andrew Jervise summarised consistent problems inherent in attempts to recreate a thorough picture of earlier stages of land use. '[F]or even when found mentioned in family charters and national records,' Jervise wrote, 'the exact locality of a vast number of them are altogether unknown, either from their utter extinction, or the orthographical change which the names have undergone.'² The lack of detailed information is one of the major frustrations in gathering data about medieval land use in charters, as the majority of charters contain no more detail than: the lands of/in or barony of {the name of the property}; for example: 'terris et baronia de fynnevin.'³ Nevertheless, additional information about these properties'

¹ M. N. DeMers, *Fundamentals of Geographic Information Systems* (New York, 1997), pp. 29, 57.

² A. Jervise, *The History and Traditions of the Land of the Lindsays in Angus and Mearns, with Notices of Alyth and Meigle* (Edinburgh: 1882), p. 2.

³ National Archives of Scotland, Papers of the Earls of Ailie, GD16/24/91, Precept of sasine, 1616.

features was occasionally inserted, creating points of recognition within the intended rights of ownership. This chapter begins by discussing these structural and land use references, which make up the core of the dataset by providing a list of features of aristocratic properties that appear to have been signifiers of status between 1449 and 1542. Essentially, these documents provide the *attributes* of the noble residences within the broader GIS dataset. These attributes, linked with the location and object ID discussed above, are the central focus of the assessment of this data in Section B. This section considers how these terminologies were used in the documents and summarises what current research has revealed about these features, leading into a discussion of the features' location and proliferation within the boundaries of Angus. Building upon the catalogue of the landscape features mentioned in contemporary documentation, the second part of this chapter looks at later descriptions of the properties that indicate some landscape features with a reasonably high probability of being retroactively applicable to the aristocratic properties of Angus.

Descriptions of the properties can be divided up into three types of features: structural, intensive resource management, and extensive resource management. As the physical structures of noble residence are at the hub of this project, emphasis is placed on the various terms used to describe these structures and how they were used. This dimension of the work is complicated by the limited number of descriptions which survive, as well as the inconsistent uses of terminology to describe the structures. Following this section, the chapter assesses the structural features described as associated with the property but not necessarily as part of the

physical structure of the noble residence. Next, it discusses the landscape features relating to resources that are mentioned within contemporary documents.

A.4.1: Structural Terms

Looking at the terms actually used to describe the structures of these properties revealed a certain language employed to describe the physical structures of lordly residences. These include terms Wheatley defines as ‘castle words’⁴, such as messuage (capital messuage), demesne, mains, tower, fortalice, castle, mansion and manor-house. In documentation produced prior to 1540, when the terms ‘castle, tower, and fortalice’ became a consistently used formula, there appears to be very little consistency when describing the seats of baronies. Some of this lack of consistency appears to arise from changes in customary practices, as in the switch from messuage to demesne to describe the lord’s lands and its contents, as discussed by Rimmer.⁵ Regardless of how consistently a specific term was applied to these structures, each reflected a different element of power being emphasized at the time the document was written, just as the later standardized ‘castle, tower, and fortalice’ highlighted the components required and expected for baronial lordship. However, in order to discuss the importance of the nuances of power connected to each term in relation to the social situation of Angus (if any), it is important to assess the differences in the rights of ownership and structural features suggested by each term.

⁴ A. Wheatley, *The Idea of the Castle in Medieval England* (Woodbridge; 2004), p. 22.

⁵ J. Rimmer, 'The Language of Property: Vernacular in the Context of Late Medieval Urban Identities', in .E. Salter (ed.), *Vernacularity in England and Wales c. 1300-1550* (Turnhout, 2011), pp. 269-293.

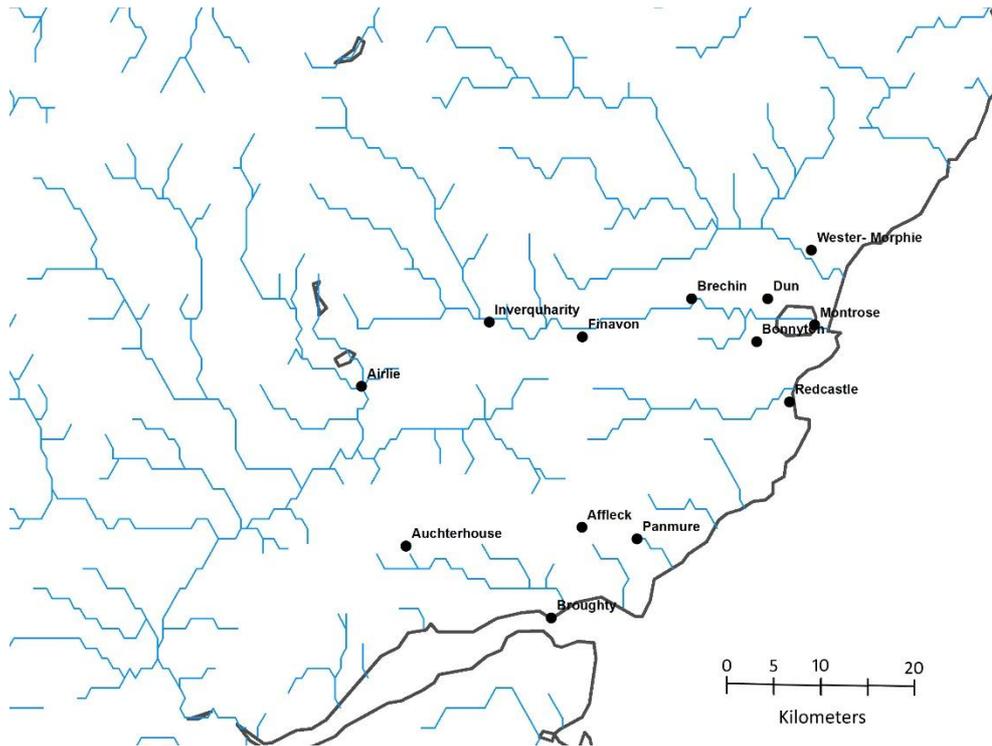
A.4.1.a: Castles

The term *castle* or *castrum* is particularly problematic because it has been defined in modern studies to be a feudal, private structure of Norman origin.⁶ Scholars have demonstrated, however, that this is purely a modern definition which cannot be applied to the contemporary understanding of the term. Although it seemingly always referred to defensive elements, Coulson points out that the defences described are not always feudal, private, or a post-Norman feature.⁷ Verbruggen, however, as highlighted also by Wheatley, clearly identifies cases where the term referred to abbeys and towns as well as lordly residences. Wheatley also points out that Geoffrey of Monmouth's reference to the only castle in London was, in fact, specifically referencing the Tower of London, stressing that the term castle was an all-encompassing generic term for defences. She ties this into Aelred's definition of a castle as comprising a ditch, wall, and tower.⁸ Although Wheatley uses primarily literary sources in her discussion, the non-specific nature of the word she highlights clearly crosses over into legal documents. This feature is obvious, too, in the charters and documents of Angus, which seem only to define the defensive specifics of properties when this was required.

⁶ E.Armitage, *Early Norman Castles of the British Isles* (J.S. Murray, 1912).

⁷ C. Coulson, *Castles in Medieval Society: Fortresses in England, France, and Ireland in the Central Middle Ages* (Oxford, 2004), pp. 29-63.

⁸ Wheatley, *The Idea of the Castle*, p. 33.



Map:A:4:1: Distribution of Noble Residences Contemporarily Termed ‘Castle’

In contemporary documents concerning noble residences in Angus, the term *castrum* is not a regular word choice. However, between 1449 and 1549, thirteen different sites are classified by the term *castle* [see MapA.4.1: Distribution of Noble Residences Contemporarily termed ‘Castle’]. Most of these were not a sole description of the place and were often accompanied by *manerium*, *fortalicium*, and *turris*, with the exceptions of Brechin, Airlie, and Redcastle, which appeared consistently with *castrum* as the only descriptor.⁹ Finavon only appeared as a castle when it was being used to indicate the location in which a charter was written.¹⁰ In some cases, the term castle was used to describe a noble structure while it was being linked to old property rights, such as a capital message, an older structure (in some

⁹ Brechin: *RMS*, ii, no. 136; *RMS* ii, no. 1111; *RMS*, ii, no. 1359 (p.277); *RMS*, iii, no. 516 (p. 115); *RMS*, iii, no. 1148 (p. 250); *RMS*, iii, no. 2320 (p. 530); *RMS*, iii, no. 2522; Airlie: *RMS*, ii, no. 683; Redcastle: *RMS*, ii, no.1481.

¹⁰ *RMS*, iii, no. 1386 (p. 306).

cases a need for repair), and with a concept of a local presence. This usage may be an attempt to use the term as a definition of an older property. However, as the term castle appears to be more common in documents after 1540, the other terminology indicative of a long established structure, rather than castle itself, remains the connection to this idea of an established presence. Interestingly, the term castle appeared less often in conjunction with descriptions of landscape features aside from mills or fishings. It was more connected to other structural features, such as tenements or outsets. This connection further implies that the term was used to describe a number of expected features and resources connected to the property. It is not surprising that the people associated with the properties described as having a castle were of high social ranking (such as Archibald Douglas, Earl of Angus, David Lindsay, Earl of Crawford and Duke of Montrose, James Stewart, Earl of Buchan, Thomas Erskine (secretary to the King), and Andrew Lord Gray), as the properties labelled as castles were mostly well known high ranking properties. Nevertheless, as will be demonstrated later in this chapter, the connection between the term castle and a property of high status is not consistent in the documents. Thomas Maule, John Russel of Guthrie, and William of Brechin, people of lesser rank, also owned properties described as castles. This lack of consistency further indicates that although the term currently suggests high ranking ownership, its inconsistent use in contemporary documents with higher-ranked owners suggests no such implication.

A.4.1.b: Towers

The tower is a distinctive structure that had many purposes, not all of which pertained to defence. Although there is a clear link between towers associated with a castle and the defensive function of the *donjon* or *keep*, modern assessments of towers, particularly Scottish and Irish, have addressed their symbolic and, in some cases, residential functions.¹¹ Visibility is a key issue, both in reference to how the structure is seen and what can be seen from it. Creighton and McManama-Kearin have discussed this in relation to visibility for defensive purposes¹² but also to the creation of a viewing platform from which other elements of the lordly landscape can be observed.¹³ The realistic application of the structures as standalone defensive elements has been discussed in regard to their ability to function self-sufficiently from the other buildings.¹⁴ The tower is often the only remaining feature of these aristocratic structures, which has been misinterpreted to mean that it was the only structural element of noble Scottish castles. However, excavations by Good and Tabraham at Threave revealed that the tower was only one component of a wider complex of structures. The lack of other remaining buildings can be attributed to a significant number of timber-built components (an equally important building material symbolising high status and power), turf, clay, or stone which has been

¹¹ R. Sherlock, 'Changing Perceptions: Spatial Analysis and the Study of the Irish Tower House,' *Chateau Gaillard*, 23 (2008), pp. 239–250.; G. Eadie, 'Detecting Privacy and Private Space in the Irish Tower House,' *Chateau Gaillard*, 24 (2010), pp. 69–75.

¹² O. H. Creighton, 'Room with a View: Framing Castle Landscapes,' *Chateau Gaillard*, 24 (2010), pp. 37–49.; K. McManama-Kearin, 'The Use of GIS in Determining the Role of Visibility in the Siting of Early Anglo-Norman Stone Castles in Ireland', (Queen's University Belfast, 2012).

¹³ Creighton, 'Room with a View', p. 37.

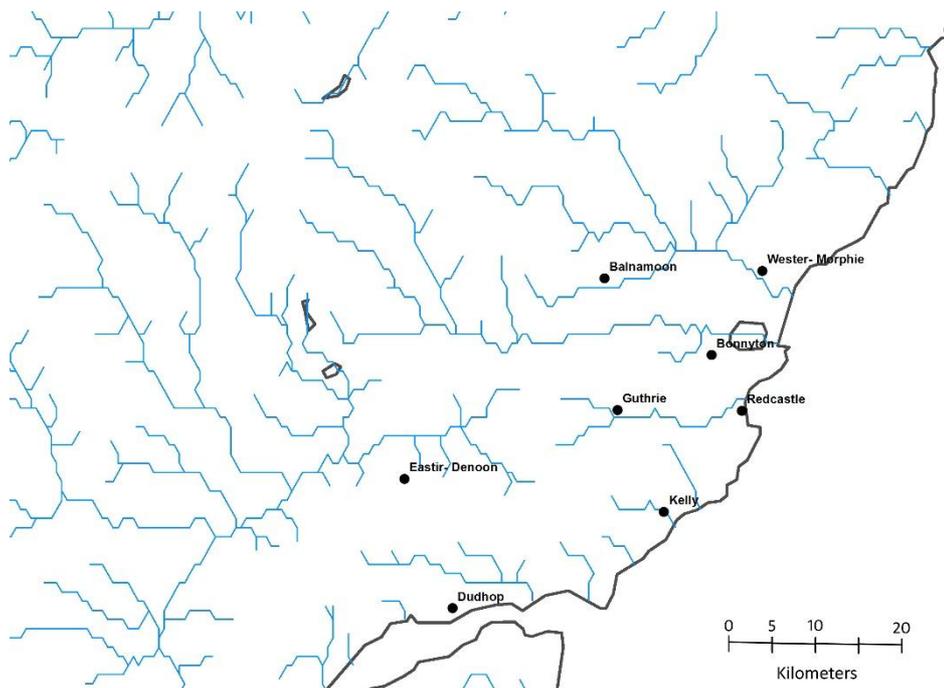
¹⁴ G. L. Good and C. J. Tabraham, 'Excavations at Threave Castle, Galloway, 1974-78', *Medieval Archaeology*, 25, (1981), pp. 90 – 140.

robbed out, which usually started from the closest accessible point.¹⁵ The survival of the tower might have served as a later viewing platform, or even for drawing attention to the tower's aesthetic in the landscape. It is also possible that their survival is indicative of their symbolism as the mark of lordship, even after they were no longer lived in and, thus, were cared for and preserved. The tower was not always mentioned in the documents but, when it was mentioned, a *tower* possibly symbolised the status of a lord, similar to the terms castle and manor.

There was very little co-usage of *castrum* and *turris* during the time period of this study. Redcastle, Wester-Morphie, Bonnyton [see Map A.4.2: Distribution of Sites Contemporarily Termed 'Tower'] and Quhitefield [Whitefield] of Kirriemuir (not mapped due to unknown location) were the only properties where both terms were used. In the case of Redcastle, the noble residence is described as a castle or a tower in two separate documents and the two terms do not appear side by side. Between 1449 and 1542, there is only one instance within the documents pertaining to Angus where a tower is listed as the only noble structure on the site. This charter refers to Easter Denoon, which appeared many other times with the terms *fortalicium* and *manerium*. Although there is little reference to resources connected to these structures, there are more instances when the term tower is linked to the resources than the term castle. Mills remained the most mentioned resources featured in connection to the term *tower*, though fishings, orchards, woods, and parks were also present. The connection to message sites is also common, perhaps adding to the idea that towers were symbols of lordship and connected to ancient ownership. As the term castle is also linked to ancient ownership, though with more of a hint to an

¹⁵ R. Higham and P. Barker, *Timber Castles* (London, 1992).

older structure, this might further suggest that the term castle includes all these types of structures. Towers, however, seem less likely to be found in a description that refers to a baronial seat. It was only used to describe a baronial seat at Guthrie and Dudhope and was otherwise used in descriptions of lands or portions of lands. Thus, it is not surprising that the people associated with these properties tended to be of a lesser rank than those found with the term castle, such as Archibald Ramsay, Walter Culles of Balnamoon, and James Foulis of Colinton. However, Qwhitefield of Kierrimuire remained a property of the Earl of Angus and the office of constable of Dundee and the property of Dudhope belonged to James Scrimgeour.



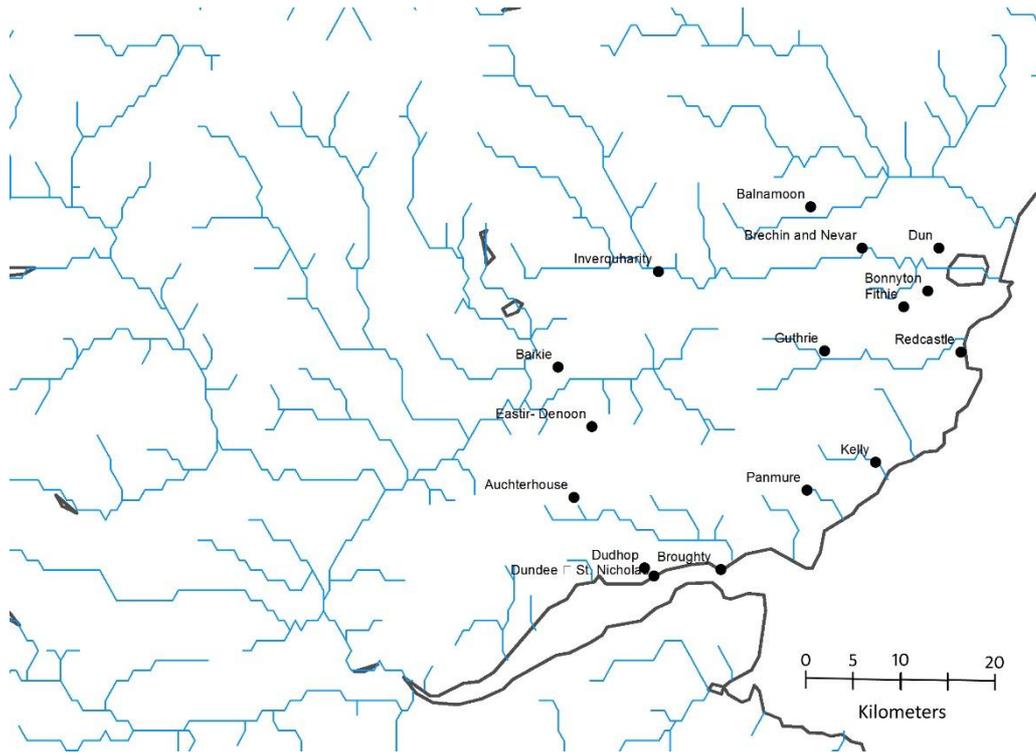
Map A.4.2: Distribution of Sites Contemporarily Termed 'Tower'

A.4.1.c: Fortalice

Fortalicium was also a very non-specific term but places a greater emphasis on the defensive nature of the structure. Presumably, it was the element that fortified a castle; it could also be a distinct feature requiring identification. It has been assumed that the term referred to a smaller version of a castle.¹⁶ O’Keeffe suggests that the term might suggest some sort of tower, linking it specifically to the motte and bailey type structure.¹⁷ Since the resources for this project specifically distinguish the tower and fortalice, assuming the term is synonymous with a tower-like structure seems unlikely (unless it is an attempt to distinguish between residential and non-residential features within the structure). It is likely that the term refers to a fortified gate-house or earthen defensive features, such as a bank or ditch, referencing the site as an enclosure. Nevertheless, the fortified nature of a structure seems to be another element of power and authority, which merits specific attention at certain times but is assumed in other instances.

¹⁶ A. King, 'Fortresses and Fashion Statements: Gentry Castles in Fourteenth-century Northumberland', *Journal of Medieval History*, 33 (2007), pp. 372–397.

¹⁷ T. O’Keeffe, 'Rathnageeragh and Ballyloo: A Study of Stone Castles of Probable 14th to Early 15th Century Date in County Carlow', *The Journal of the Royal Society of Antiquaries of Ireland*, 117 (1987), pp. 28–49.



Map A.4.3: Distribution of Sites Contemporarily Termed 'Fortalice'

Although the documents describe fewer structures as a fortalice than as manors, *fortalice* was the most frequently used term of the trio of 'castle, tower, and fortalice' used in conjunction as a *castellated* structural reference. There are sixteen individual sites mapped [see Map A.4.3: Distribution of Sites Contemporarily Termed 'Fortalice'], which do not include Whitefield of Kirriemur. The term fortalice did not appear alone as a descriptor but was accompanied by castle, tower, manor, or mansion. This occurrence may be an indication of the fortalice's function in differentiating fortified and residential space, as all the other terms could have a residential connotation. As mentioned previously, it is possible that the separated nature of this structural descriptor might be indicative of a fortified feature, such as a gatehouse or a ditch embankment. This indication seems even more likely as the term fortalice was used in describing the chapel of St. Nicholas in Dundee, which

would have been part of the structural make-up of the fortalice.¹⁸ Partly due to the fact that the term fortalice is used to describe more properties, it was used in connection with more resource features. (This usage might have something to do with its frequent but inconsistent use as a bridge term to manor.) Fortalice is the most connected castellated structural reference to other landscape features.¹⁹ The features it was listed with, however, remain the same as those with castles or towers, with substantial attention to mills and fishings, and some mention of orchards, woods and parks. Among the well-connected owners of fortalices were Archibald Earl of Angus, John Lyon, Lord Glamis, Christian Stewart (cousin to the king), James Scrimgeour, Constable of Dundee, John Earl of Buchan, and George Earl of Rothes. It also included more obscure men such as David Wood of Craig, Patrick Gray of Buttergask and Walter Cules of Balnamoon.

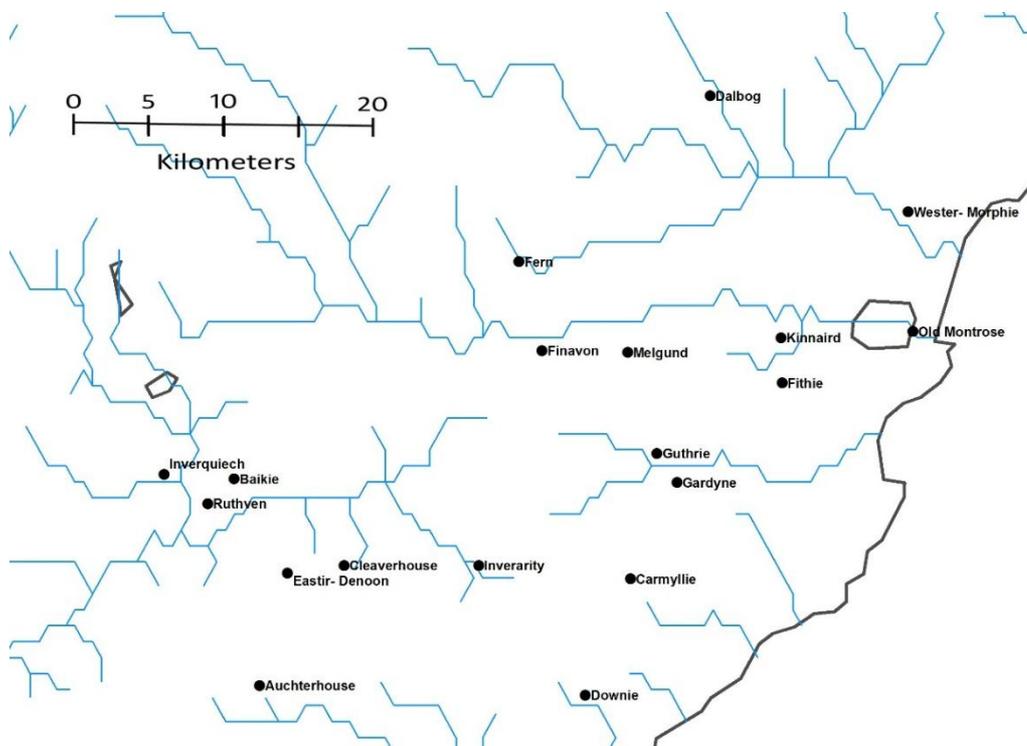
A.4.1.d: Manor and Mansion

Other common terms used to describe the structures of these noble lands were *manerium* or manor-house and *mansio* or mansion. Manor-houses and mansions are typically understood as the main residential house of an estate, specifically tying the structure to the land it belongs to rather than the political position of the owner of the estate. Although mansion currently has a connotation of a large house, the medieval understanding would have been simpler, referring to a dwelling house of some architectural pretension. The use of manor-house or mansion, especially in regard to

¹⁸ *RMS*, iii, no. 2484 (p. 570).

¹⁹ This may be because it is the most likely to be spatially close to the other features within the complex.

properties that were labelled with castle, fortalice, and/or tower before or afterwards (or conjointly with this description), seems to suggest that the use of the term was to draw attention to the residential rather than defensive aspects of the structure [see Map A.4.4: Distribution of Sites Contemporarily Termed ‘Manor-house’].²⁰ Although there is some tendency to attribute the social penchant for promoting residential prominence as a post-medieval trend, early social hospitality demands make it an obvious focus of power.²¹



Map A.4.4: Distribution of Sites Contemporarily Termed ‘Manor-house’

The term *manerium* is, by far, the most common label used to describe noble architecture in the fifteenth and sixteenth centuries in Angus. Although it is usual to find the term used in conjunction with terms of castellation, like tower, castle, and

²⁰ C. McKean, *The Scottish Chateau: The Country House of Renaissance Scotland* (Sutton, 2001), p. 105.

²¹ C Woolgar, *The Great Household in Late Medieval England* (New Haven, 1999), p. 9.

fortalice, it is also the most common term used alone to describe the noble architecture. There are many cases where this term is used once, where castle, fortalice, or tower are used on another occasion.²² When the term is used with fortalice and tower, it seems very obvious that there is an intention to separate fortified structure, symbol of lordship, and dwelling as distinct rights to the land regardless of the physical unity or separation of the structure. Again, as this term expands the catchment of sites and resources, it is the most connected to more domestic resources and other landscape features, with charters that detail gardens as well as orchards. Mills and fishings remained the most prominent resource feature, with tenement lands and associated buildings taking a secondary position to importance in these documents. The descriptions of Dalbog include the right to have an alehouse within its land, suggesting another type of structural presence.²³ Interestingly, the term *manor-house* is not used in conjunction with parks or forests when referring to properties in Angus, though it is used with woodland at Ruthven.²⁴ There is a strong connection between the properties that are described as manors and baronial seats and messuages, though not necessarily in connection to an older structure on the property. As some of these structures described as manor-houses were known as high status locations, it is not surprising to see some very high status names in the ownership list. However, less prominent people also owned such properties, suggesting that the term was not status specific.

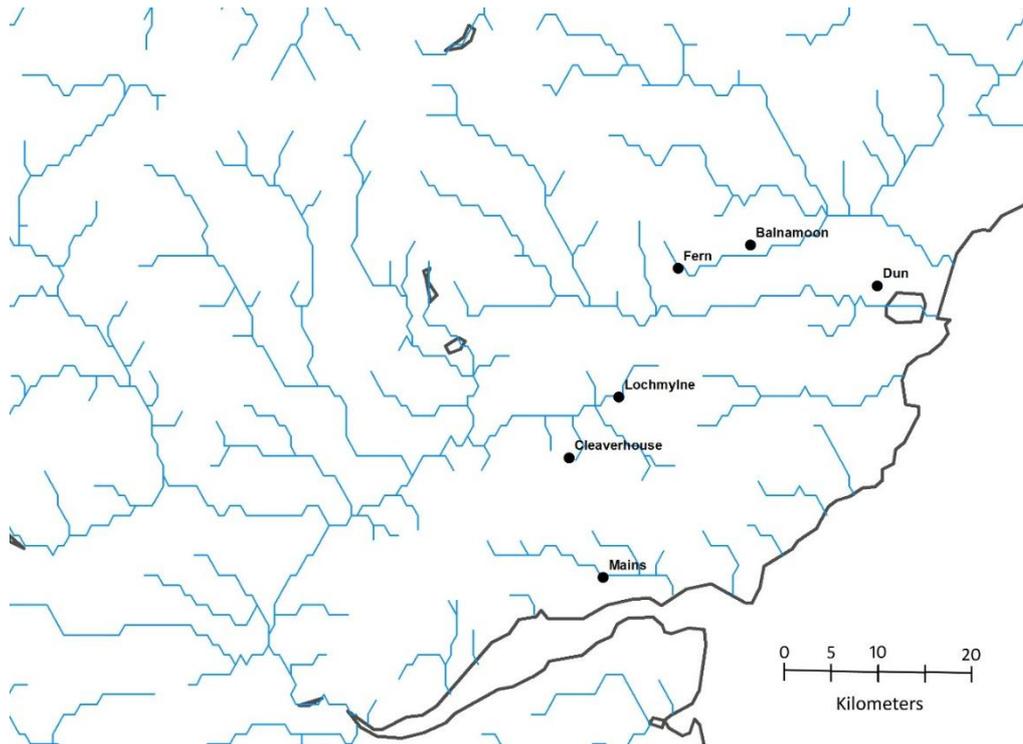
²² Finavon: Manor-House: *RMS*, iii, no. 2484 (p. 569); Castle: *RMS*, iii, no. 1386 (p. 306).

²³ *RMS*, ii, no. 3627.

²⁴ *RMS*, iii, no. 506.

Mansion is another term used to describe the aristocratic dwelling in Angus. It was not necessarily used to replace the term manor-house, as Fern was listed as having both mansion and manor-house in 1489-1490.²⁵ Otherwise, its use is similar to manor-house, being used on its own as well as with fortalice and tower, though it exists alone more often than manor-house. It is the least-used term to describe noble structures in Angus during this time but adds places such as Fern, Mains of Dundee, Halton of Ogilvy (or Claverhouse), and Lochmill to the list of noble properties within Angus [see Map A.4.5: Distribution of Sited Contemporarily Termed ‘Mansion’]. Balnamoon and Dun are both described as mansions in some documents and castles, and towers or fortalices in others (or in the same document, as in the case of Balnamoon). Similar to all other noble property names, mills and fishings are the external features identified within the document as being connected to the mansions listed.

²⁵ *RMS*, ii, no. 1938.



Map A.4.5: Distribution of Sited Contemporarily Termed ‘Mansions’

A.4.1.e: Other Properties

In some instances, these properties are listed as having the potential for other buildings of various and unspecified function. Usually the terms are *outsetts*, *pertinenties*, or *annexis et connexis*, all of which were important enough to attach legal recognition. What is missing is a specific statement of their purpose. *Tenements* also appear in these lists, though this presumably refers to further properties occupied by dependents of the lord. This may be because certain structures, like storehouses or housing for workers and serving staff, were assumed given the status of the land or the type of structures that were present and too commonplace to specify. Although *outsetts* and *pertinenties* refer to detached land and so could have had individually standing structures on them, many of the storerooms and servants

quarters would have been within the main block of the property. Other buildings contained within the main residential block would have included stables, kennels, and falconries. Kennels and falconries might be more associated with any hunting property that is mentioned but the purpose of the horses extended beyond entertainment activities and played a significant role in noble activities, particularly in regard to regular travel rhythms.²⁶ Regardless of whether these structures were immediately serving the noble household or if they were merely structures that came with the land, there was a reason for the lack of specification within the document. However, as the lands, in some cases, might not be described in detail, as part of the greater complex of the noble residence these features were perhaps assumed and so not specified.

Terminology for the noble residences themselves remains inconsistent, though there is a general tendency in Scotland to consistently use the three terms *castle*, *tower*, and *fortalice* in various combinations. In some cases, such as at Downie, Ruthven, and Finavon, these terms were additional descriptive terms applied to a structure that was previously known as just a mansion, manor, or castle. Up to 1542, the records relating to Downie appear to be referring to just the main structure as a manor-house but, afterwards, the terms tower and fortalice were attributed to the property.²⁷ Ruthven had also been previously recorded as a manor but, by 1544, was referred to as a tower and fortalice as well.²⁸ Tower and fortalice were also added to the terms

²⁶ Woolgar, *The Great Household*, p. 181.

²⁷ *RMS*, ii, no. 3655; *RMS*, iii, no. 1326 (p. 291); *RMS*, iii, no. 2453; *RMS*, iii, no. 2484 (p. 570); National Archives of Scotland, Papers of the Earls of Airlie, GD16/24/90, Lands and Barony, 1615.

²⁸ *RMS*, iii, no. 506; *RMS*, iii, no. 3067.

describing Finavon (Castle and Manor) after 1542.²⁹ With some places, such as Lundie, where a chapel associated with the barony was known, a fortalice, castle, and manor-house were added as describing terms by 1544.³⁰ However, manor-house and mansion still appear as common descriptions of some of these properties. It is possible that these new descriptors are being used to describe what the structures had become during renovations and new building in the late sixteenth century; however, the use of these three terms became common after 1540, well before many of these structures had undergone significant reconstruction or remodelling. The fact that there seems to be an inconsistent use of these terms in documents contemporary to the period of study raises questions over the precision of their meaning in later records.

A.4.2: Features of Production

The structures of the noble residences formed the central point from which interaction would have taken place but, in order to discuss the situation of how the noble residences interacted with the surrounding landscape, it is also important to understand what features were present that were directly connected to production and economic gain. These landscapes have been identified into two different types of resource exploitation: intensive and extensive. Intensively managed lands are highly regulated and include regularly maintained lands, such as mills, fishings, parks, forests, woodlands, and gardens. Extensively managed features were those receiving

²⁹ *RMS*, iii, no. 3231.

³⁰ *RMS*, iii, no. 3177.

minimal regulation and maintenance, such as mosses, meadows, and pasture. Although some features were more prominent than others, they were all significant parts of the daily life of these noble residences.

A.4.2.1: Intensively Managed Lands

A.4.2.1.a: Mills

The mill sits between features that were structural and those centred on production. The term *molendinum* is usually translated as mill or mill house.³¹ Occasionally, the mills were specified as being grain or fulling mills. However, when they are not specified, it has been assumed that they were some sort of grain mill. The term often appears in the plural, which could refer to many possible milling options at the time. Ambler and Langdon have pointed out that the majority of mills that were associated with medieval demesne land in England were water mills used for grinding grain.³² It is possible for there to have been more than one water powered grain mill associated with the land or other types, such as mills run by wind, horse, or hand powered mills. However, the possession of mill rights by the lord meant that they had a monopoly of the amenities associated with milling, meaning all the grain grown within the barony had to be ground at the baronial mill.³³ The tenants of the land were required to grind their grain at the lord's mill, providing the lord with a certain percentage of the grain or a tax called *thirlage*. Free burgesses had the right to grind their grain at the mill of

³¹ C. Lewis and C.Short, *A Latin Dictionary* (Oxford:1907), p. 1157.

³² J. Langdon, *Mills in the Medieval Economy: England 1300-1540* (Oxford, 2004), p. 9.

³³ M. Sanderson, *Scottish Rural Society in the Sixteenth Century* (Edinburgh, 1982), p. 17.

their burgh, otherwise they were required to use the mill of their superior lord. The plural form in the charters possibly refers to any mill within the baronial jurisdiction, sometimes in a location far away from the main property of the barony but with an assumed focus on the main water powered grain mill. However, it is likely that some charters indicating mills were specifying the right to have mill lands, a mill, and a portion of what is ground there, regardless of whether there was already a mill present. This not only indicates a significant amount of control over the production of grain within that property but also the importance of mills and mill rights as a key element of lordship.

The placement of the mill was dependant on the availability of the appropriate water level and topography and this created a new place for gathering and interaction sited directly on the water source. Horizontal mills were still in use in the Angus area in the seventeenth century³⁴ but Shaw proposes that these were mostly owned privately by tenants and that vertical mills were probably more common in Scotland from the fourteenth century. Consequently, Shaw states, 'all references to mills in charters to lands must relate, by implication, to vertical mills'.³⁵ Overshot, undershot, and breastshot milling technology did not require fast water flow but were used according to the available amount of falling momentum regulated through water stores gathered from many streams or diverted from the river.³⁶ The undershot and

³⁴ J. Shaw, *Water Power in Scotland, 1550-1870* (Edinburgh, 1984), p. 8.

³⁵ *Ibid*, pp. 45, 11-12.

³⁶ A.Lucas, *Wind, Water, Work : Ancient and Medieval Milling Technology* (Leiden: 2006), p. 32.

the central place where significant production from the land was brought and redistributed. Not only did the mills signify wealth, but they became the elite structure node with the most interaction from the surrounding community.

The prolific number of mills listed in Angus is not surprising, due to the many suitable water resources and the significance mills had to medieval daily life. Many of the mills were listed as important properties in their own right, though approximately seventeen are documented as being directly associated with a property which also contained a noble residential building. These included Baikie, a property connected to Glamis, functioning as the residence of the heir; two connected to Finavon (one directly connected to the castle property, the position of which has been taken from Pont, and another called Wardmill, which is also part of the Finavon estate), Inverquhar, Dun and Bonnyton [See Map A.4.6: Distribution of Mills in Angus]. Although the mention of mills is prominent in listing features of a noble property, the importance of the mills is stressed by the number of times these properties were mentioned alone, (i.e. they were significant in their own right), as has been explained above. However, despite being separated from the other structural symbols of lordship on these occasions, these properties were often clearly linked to the noble establishment. Often, this connection is simply due to the same name being attached to these properties, indicating the properties as a whole unit and these features merely parts, such as Fern, Panbride, Dunlappie, and Gardyne. Many other mills were linked to the rights of barony but were detached from the main seat of the barony and given to others to care for. Others are clearly connected to burghs, serving the resident population. Although there is mention of the church at Brechin

having a mill, other mills belonging to religious houses have not been mentioned in this project, causing some of the apparent gaps in territorial coverage on the map.

A.4.2.1.b: Fishings

After mills, fishings were the most common type of feature associated with noble properties. Since fish featured heavily in the diet of medieval people, access to a surplus of this type of food was a significant sign of power and authority. Although fishponds, *vivaria*, were likely to be kept in the garden or park area, the fishing rights, *piscaria*, of the property would have been most commonly along a river, possibly physically disconnected from the demesne property. Fish ponds could allow for the consumption of fresh-water fish in a noble diet. These ponds also provided an aesthetic element in gardens or park areas. It was not uncommon, however, for these fishponds to also serve as a mill pond, as this mechanism for the mill would also provide an adequate habitat for the fish.³⁸ There is no documentary evidence for fish ponds in Angus but fish ponds could be included into the general term *fishings*, especially when there is a close connection to a mill site. An emphasis on the consumption of fish, however, made it necessary to have access to salt water fish, such as herring, haddock, plaice, or sole.

Fishings in Angus were not always directly related to castle lands but were, by and large, associated with some other detached land belonging to the barony. This detachment is not surprising as many of the structures do not border any of the major

³⁸ M. Hansson, *Aristocratic Landscape: The Spatial Ideology of the Medieval Aristocracy* (Stockholm, 2006), p. 132.

rivers. Although many of the fishing rights were focused on trout, pike, and eel, salmon fishing was the most specified and regulated. Therefore, access to a river that was both connected to the ocean and an established spawning ground for the salmon was very desirable. These fishings could take many different forms: some were cruives, which were obstructions in the river that allowed for a small number of fish to swim up the river but not necessarily down; others were nets or other traps that were set up to capture the fish during low tides. These would have been noted features in the waterscape of the area and the sight of the salmon run would have been impressive. The fishing rights in a defined area would have been exclusive to the noble of the property but there was no guarantee that his fishing would have been the only one on the river. In the case of Firth of Tay, the other fishings were upstream of some very extensive fishings belonging to Balmerino Abbey.³⁹ Therefore, it is typical to have stretches of different fishing rights moving up the river.

Out of thirty-eight different fishing site references found in Angus, only seventeen are directly associated with the lands attached to a noble residential property (see Map A.4.8: Distribution of Fishing in Angus).⁴⁰ For example, the fishings of

³⁹R.D. Oram, 'A Fit and Ample Endowment? The Balmerino Estate, 1228-1603' in R.D. Oram et. al. (eds.) *Life on the Edge: The Cistercian Abbey of Balmerino, Fife (Scotland)* (Pontigny, 2008), pp. 61-80.

⁴⁰ Although Rimmer has identified tenement and message as noble residences in an urban context, this project understands the term tenement to mean a property owned by, but not the personal residence of a noble. Therefore, they include properties of Panbride (*RMS*, ii, no. 3104); Disart (*RMS*, ii, no. 3417); Dunloppy (*RMS*, iii, no. 2810, p. 652); and Smythstoun (*RMS*, iii, no. 2825, p. 656), where tenements are the only residential structure mentioned, Auldbar (*RMS*, iii, no. 2192), where cottage is used, and Capill (*RMS*, iii, no. 2395) Gothraison (*RMS*, iii, no. 2700), where croft is mentioned.

Broughty and Bonnyton were listed both with⁴¹ and without⁴² references to their associated noble residences. Although most of the fishings relate to lands or portions of lands not directly related to the rights of barony or lordship, some are clearly part of the many properties held by major lords. For example, the North Esk fishings of Kinnaber were listed as the property of William, Lord Graham (who would become the first Earl of Montrose) and Panbride belonged to Robert, Lord Crichton of Sanquhar. Specific waters mentioned as having fishings are on the South Esk (Dysart, Arrat, Brechin, Auldbar, Dun, and Kinnaird), the North Esk (Kinnaber, Marynet), the Tay (Monifeith, Stobhall, and Gothrastron), and the Isla (Stobhall⁴³). Tayock is also specified as being above the land called the Sands, presumably the Tayock Burn above Montrose Basin.⁴⁴ Grange and Monifetih are the only properties with specific mention of marine fishing and Bonnyton is specified as having rights to both the fresh and salt water fishing. Fishing rights were greatly focused on trout, pike, and eel but salmon fishing rights were the most highly regarded. Salmon fishings are specified at the Milltown of Arrat, Brechin, Gothraison, Kinnaird, and Auldbar. Cruives are listed as being at the fishings of Brechin on the South Esk and at Auldbar. This project identifies a mention of an unspecified (by the name of the river or type of fish) fishing to be fresh water fishing, unless it seems geographically unlikely (as in Dunninald, Tayok, Kinnaber, and Panbride). Those that are identified

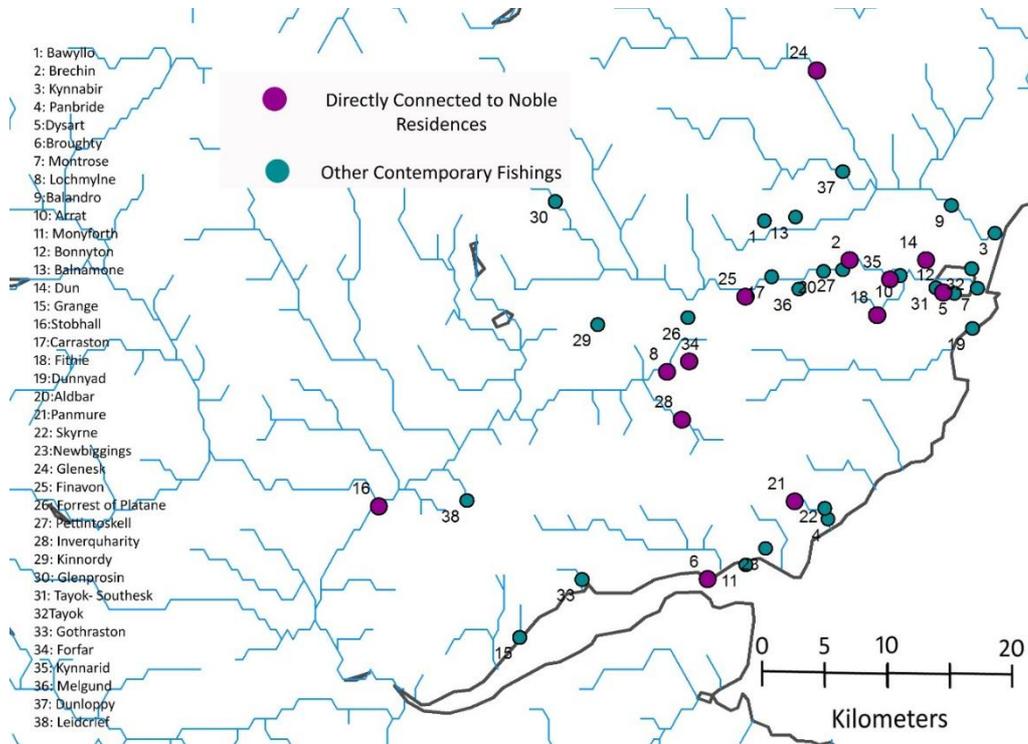
⁴¹ Broughty: *RMS*, ii, no. 3419; *RMS*, iii, no. 2650 (p. 611); Bonnyton: *RMS*, iii, no. 2693 (p. 623).

⁴² Broughty: *RMS*, ii, no. 3489; Bonnyton: *RMS*, iii, no. 782.

⁴³ The property of Stobhall is listed as having land rights in both Perthshire and Forfarshire. Given that the fishings seem to cover the confluence of the Tay and Isla, and that specific fishing boundaries are unknown, it has been included in the list of fishings in Angus and not when discussing noble residences in Angus.

⁴⁴ *RMS*, iii, no. 2640 (p. 609).

with a water or specifically state that they are relating to salmon fishing have been taken as salmon fishings.



Map A.4.7: Distribution of Fishing in Angus

The current location for the fishing beats for the Dun property lie on both sides of the River South Esk, between the old railway viaduct and the road bridge. There are five pools within this fishing which have been used as the locations of the Dun Castle fishings: viaduct, thornbush, Midsteam flats, hurl pots, and march pool.⁴⁵ There are four fishing beats advertised for Finavon on the River South Esk, one called the Castle beat, which has seven pools. The five sites chosen for the location of fishings related to Finavon were: Beeches, Pheasantry, Red Brea, Craigo Stream, and Castle Stream. The Melgund fishings were possibly in the current Indies beat for Finavon,

⁴⁵ Fish Pal, 'House of Dun Fishings' <http://www.fishpal.com/Scotland/Esks/HouseOfDunFishings/?dom=Esks>. [Accessed 22 March 2014].

as one of the pools is named Melgund Pool.⁴⁶ Edzell has two beats along the west bank of the River North Esk, one between the Gannochy Bridge on Fettercairn Road to the suspension bridge at Edzell village and the other between Lyn Martin pool to the confluence of the North Esk and the West Water.⁴⁷ Though there are no current fishing beats for Bonnyton and Fithie, it is likely that their fishings were between the Dun and Kinnaird fishings. As these other fishings are close to the properties, it is assumed that the fishings at Airlie would have been near the castle on the River Isla, known for its salmon run, Brought Castle's near the castle in the mouth of the Tay, and Panmure's near the estate on the Monikie Burn.

A.4.2.1.c: Eels

Some of the greatest aquatic resources came from organisms that migrated from the ocean to fresh water, such as eels, salmon, and some trout. Zooarchaeological evidence from England shows that there was a high consumption of these migratory types until the eleventh century, when the consumption of salt water fish became more popular.⁴⁸ Studies in Ireland suggest that, although salmon was exported, eels remained in local consumption.⁴⁹ Eels were often used to pay rents, of which accounts indicate the abundance of this aquatic animal in early medieval England in

⁴⁶ Finavon Castle Fishings, <http://www.finavoncastlefishing.co.uk/>. [Accessed 22 March 2014].

⁴⁷ Fish Pal, Edzell Fishings, <http://www.fishpal.com/Scotland/Esk/Edzell/?dom=Esk>. [Accessed 22 March 2014].

⁴⁸ J.H Barrett, A. M. Locker and C. M. Roberts, 'The Origins of Intensive Marine Fishing in Medieval Europe: The English Evidence.' *Proceedings. Biological Sciences / The Royal Society*, 271 (2004), p. 2418.

⁴⁹ A. O'Sullivan, 'Harvesting the Waters', *Archaeology Ireland*, 8 (1994), p. 11.

the tens of thousands,⁵⁰ through to the seventeenth century in Ireland.⁵¹ Darby points out that the increase of eel payments coincides with Lent, particularly the feast of St. Benedict (21 March); however, as eels are an autumn season catch, rent payments were probably made in salted or smoked eel.⁵²

Like salmon, eels are mainly caught with nets or woven baskets during the adult's migratory return to spawn in the autumn; however, unlike salmon, eels move from fresh water to spawning grounds in the North Atlantic.⁵³ Inland meadow sites,⁵⁴ marsh lands,⁵⁵ and other shallow water areas were common eel habitat and, as Hoffman says, there was regular 'fishing of eel at weirs, mills and in still water habitats along water courses.'⁵⁶ Hoffman has also shown that an increase of medieval European still water habitat, particularly around the Rhine Delta, allowed eel populations to prosper and likewise increase their consumption by human populations.⁵⁷ There is some evidence of live eels being kept in boxes⁵⁸ but it was

⁵⁰ H. C. Darby, *The Medieval Fenland* (Cambridge: 2011), p. 31.

⁵¹ A. E. J. Went, 'Eel Fishing at Athlone: Past and Present,' *The Journal of the Royal Society of Antiquaries of Ireland*, 80 (1950), p. 149.

⁵² Darby, *The Medieval Fenland*, p. 31.

⁵³ O'Sullivan, 'Harvesting the Waters,' pp.11-12.

⁵⁴ Went, 'Eel Fishing at Athlone: Past and Present,' p.146.

⁵⁵ Darby, *The Medieval Fenland*, p. 7.

⁵⁶ R. C. Hoffmann, 'A Brief History of Aquatic Resource Use in Medieval Europe,' *Helgoland Marine Research*, 59 (2004), p. 26.

⁵⁷ Ibid.

⁵⁸ O'Sullivan, 'Harvesting the Waters,' p. 11.

probably more likely that humans built shallow water ponds adjoining the rivers or amended natural ones for keeping eel.⁵⁹

There are two references to eel fishings in Angus. In 1511, there were 100 eel pools in the loch at Forfar belonging to the burgh.⁶⁰ This presence suggests that they were managing the loch to produce an appropriate environment for the townsfolk to use and, possibly, to help pay to Restenneth Priory. In 1541-1542, the properties of Hirdhill, Balbride, and Kinnordy, near Kirriemuir, were connected to a loch that had an eel box for keeping live eels.⁶¹ This link suggests that people were practicing both *intra-habitat* and *extra-habitat* eel management in Angus. The lack of other mentions of eels in Angus, despite the likely common habitat, is probably because they were either too common to be mentioned or they were included in the non-specific fishings listed as part of the property.

Considering the significant focus on the fishings and mills in the contemporary charters, it was expected that there was a similar focus on these features in later charters. In most cases, the presence of a mill or fishing has been confirmed across an extended period of time, such as in the case of Brechin.⁶² There are some places where later documents reveal new mentions of mills and fishings, such as in relation to the Forest of Platane, where there was known fishing from contemporary

⁵⁹ Twenty eel ponds have been found in Tudworth, Yorksire. See J.McDonnell, *Inland Fisheries in Medieval Yorkshire, 1066-1300* (York, 1981), p. 8.

⁶⁰ *RMS*, ii, no. 3583 (p. 771).

⁶¹ *RMS*, iii, no. 2601.

⁶² Fishing: *RMS*, ii, no. 1111; *RMS*. Iii, no. 2320; Mill: *RMS*, ii, no.1358; *RMS*, ii, no. 3652; *RMS*, iii, no. 468; *RMS*, iii, no. 2320.

documents but no mill previously mentioned.⁶³ Ruthven and Balnamoon were the only properties where only the mill was confirmed by later documents; there appears to be no contemporary reference to fishing associated with Ruthven. Both mills and fishings were newly stated as being present at Lundie and Inverarity.⁶⁴

A.4.2.1.d: Forest

The term *foresta* specifically translates to land under forest law. However, despite the modern connotation of the word as an area with trees, the medieval use referred to a specific type of management which did not always include trees. The idea of forest law refers specifically to the conservation and management of certain property, with specific reference to maintaining certain type of game to be used as source of high status food for feast as well as entertainment (hunting) for noble guests. Forest law frequently related to wooded areas in England and Young suggests that it ‘protected the trees from complete destruction and slowed the inevitable encroachment of field upon forest.’⁶⁵ Rotherham draws the connection of parks and forest lands, suggesting that they ‘are part of a suite of landscape types that mix trees and grazing or browsing mammals.’⁶⁶ Gilbert stresses that the area known as forest was a reserve of land which ‘included both wooded and open land’ and that the

⁶³ RMS, iii, no. 2484.

⁶⁴ Sibbald in W. Macfarlan, *Geographical Collections Relating to Scotland Made by Walter MacFarlane* (Edinburgh, 1907), pp. 37, 40, and 48.

⁶⁵ C. R. Young, ‘Conservation Policies in the Royal Forests of Medieval England’, *Albion: A Quarterly Journal Concerned with British Studies*, 10 (1978), p. 95.

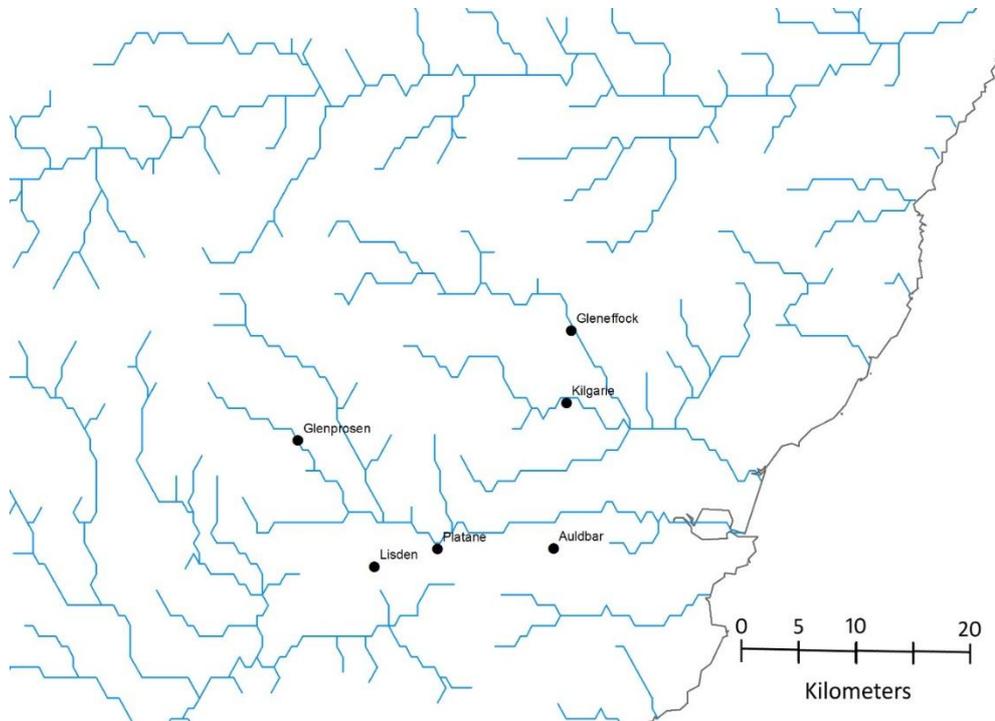
⁶⁶ R. Liddiard, *The Medieval Park : New Perspectives* (London, 2007), p. 79.

restrictions to the area were focused more on controlling economic development to ensure the environment was appropriate for sustaining game.⁶⁷ Therefore, it is reasonable to suggest that the forested area was maintained to keep its deer or boar populations healthy. For deer, this involves ensuring that the trees provide leafy new growth at an appropriate grazing level and that there are areas of 'lawn' or open grass land for more grazing. Similarly, the boar would need pannage (acorn grazing).

Although Gilbert suggests that a limited amount of economic activity was allowed in this area, some management would have been needed to maintain proper conditions. For example, tree growth would have been monitored to prevent overcrowding and enable appropriate grazing. Therefore, some of the wood in the area would have been used as timber for construction or heating. The open lands would have been monitored for effective fertilisation and signs of overgrazing. Open land was also important for keeping game birds and hawking in the area. This emphasises the forest land as an area of production, though for entertainment and food. Nobles' preserved hunting rights and those granted to others were challenged by individuals hunting on the land without permission. Managing and prosecuting such transgressions were part of the noble's legal and governance roles as the community administrator. The proximity of the area to the noble residence made it both a prominent display of the aesthetic value of the noble landscape but also a visual reminder of the legal rights attached to the land. This does not mean that forest land was never disconnected from the main baronial estate but, rather, that a disconnected

⁶⁷ J. M. Gilbert, *Hunting and Hunting Reserves in Medieval Scotland* (Edinburgh, 1979), p. 91.

forest area would be in some way connected to a structure of power, most likely what is termed a hunting lodge.



Map A.4.8: Distribution of Contemporary Sites with Forests in Angus

The forests mentioned in contemporary documents provide an interesting connection to noble properties. All of the properties are in the northern part of the shire. [See Map A.4.8: Distribution of Contemporary Sites with Forests in Angus]. Two of the properties, Gleneffock and Auldbar, are not discussed by Gilbert, which might have been due to the time constraints of his study. Lisden is also not mentioned by this name by Gilbert but, based on location, may be the Milton of Earlsruthven. The Forest of Platane, which Gilbert lists as Plater, is the most commonly referred to forest in Angus between 1449 and 1542. Gilbert lists it as lost lands of the crown in 1474, when they had been given to the Lindsays⁶⁸ as a lordship and barony connected to the properties of Finavon. Given the large number of properties it

⁶⁸ Ibid, pp. 340, 364.

contains, including fishings, mills, and possibly the park of Finavon, and its inclusion in lordship or barony, it is likely that, by the later fifteenth century, not all of the land was managed under forest law but was merely the name attributed to the property retaining evidence of its previous management scheme. In 1474 it was listed as being held in free forest, meaning there would have been clear economic limiters on how the land could be exploited and what activities could be undertaken.⁶⁹ The property description of Gleneffock included woodland;⁷⁰ actual mention of woodland within the forest occurs only at Glenprosen, where ground for trees is mentioned to be within the forest,⁷¹ and Aldbar, where the trees are listed to be in the free forest.⁷² Liden is the only property mentioned in conjunction with moors, moss, and lake held in commons.⁷³ The right of forest law in the late fifteenth and early sixteenth century seems to be unworthy of mention in the surviving documents. Although there are not many references to the forests in Angus, it is clear that they were multi-use properties.

A.4.2.1.e: Woodland

Having established the types of potentially wooded land that have clear legal and possibly clearly defined borders, it is important to consider the terms a *silva* or *nemus*, referring to a wooded area. The use of these terms in place of forest does not

⁶⁹ RMS, ii, no 1191.

⁷⁰ RMS, iii, no. 1465 (p. 323).

⁷¹ RMS, ii, no. 1560 (p.328); RMS, iii, no. 885; RMS, iii, no. 2402; RMS, iii, no. 2601.

⁷² RMS, iii, no. 2192.

⁷³ RMS, iii, no. 2150.

necessarily mean that certain legal and social restrictions did not apply to this property. However, such restrictions differed from those applying to areas described as a forest or park. Indeed, a place characterised as woodland was used and understood in terms of a managed productivity, with a focus on building materials.⁷⁴ By the fifteenth century, it is fairly clear that large timber in Scotland was in short supply and being imported from Scandinavia. However, post and wattle building still needed small malleable wood, called withies, usually from willow, hazel, alder, birch, elm or fruit trees, which came from coppiced trees or casual gleaning from hedgerows and other woodland.⁷⁵ Due to great diversity of the woodland ecosystem, other resources, such as broom, could be gathered for roofing. The undergrowth was also used for seasonal grazing.⁷⁶ The habitat that was being created for the needs of the people may have determined whether or not the woodland was enclosed or not.

It is not always immediately clear from documentary evidence what type of habitat was being created. Rowe uses the description of ‘wood for fences’ to determine if an area of wooded land was managed or not when using evidence from the Domesday books.⁷⁷ The need for wood as a building material in aristocratic landscapes was significant. Repair accounts from the bishop’s palace at Spynie suggest a huge amount of timber was needed for repair and construction, even for the stone based

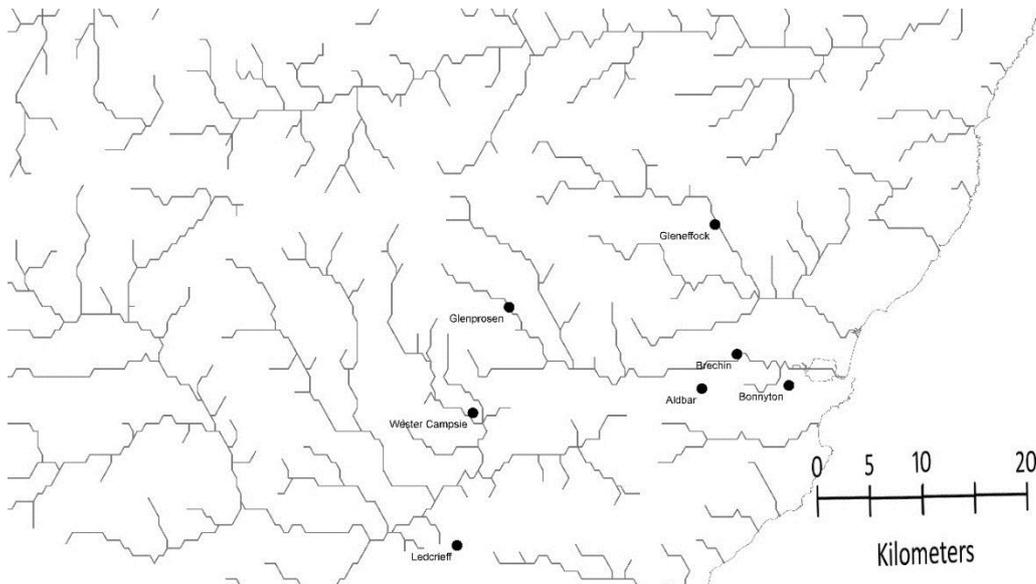
⁷⁴ J. M. Gilbert, ‘Place-Names and Managed Woods in Medieval Scotland’, *Journal of Scottish Name Studies*, 5 (2001), p. 35.

⁷⁵ A. Crone and F.J. Watson, ‘Sufficiency to Scarcity: Medieval Scotland, 500-1600’ in T.C. Smout (ed.) *People and Woods in Scotland: A History* (Edinburgh, 2003), pp. 66-75.

⁷⁶ T.C. Smout, A.R. MacDonald, and F.J. Watson, *A History of the Native Woodlands of Scotland, 1500-1920* (Edinburgh, 2007), p. 16.

⁷⁷ R. Liddiard, *The Medieval Park: New Perspectives* (London, 2007), p. 128.

structure.⁷⁸ It is likely that the high quality oak would have come from highly managed parks but that other timber would have come from woodland. In England, Rowe demonstrates the direct connection between woodland and parks as she explains that heavily wooded areas supported more parks.



Map A.4.9: Sites with Woodland as a Documented Feature

There are not many contemporary references to woodland in Angus, so its inclusion suggests that either there was some significance of woodland as a property or confirmation that woodland during this time in Scotland was rare and greatly valued. Interestingly, the woodland in Angus occurs in two places with noble residences at Brechin⁷⁹ and Bonnyton.⁸⁰ However, no link can be made to specific structural terms, as Bonnyton is also listed with a tower and fortalice, and the other two references do not mention any noble residences. At Ledcrief, the woodland is listed in conjunction with mills and fishings, other typical resource features. At Wester-

⁷⁸ A. Ross, 'Spynie Palace and the Bishops of Moray, History, Architecture and archaeology' (2004), p. 233-235.

⁷⁹ *RMS*, iii, no. 1345.

⁸⁰ *RMS*, iii, no. 2693 (p. 623).

Campsie, the woodland is listed with caves. This indication might suggest a further resource of fertiliser in the form of bat guano or the provision for shelter to other animals being hunted or grazing within the woodland. The contemporary evidence remains limited, but the high value of timber during this time might further confirm the general scarcity of this resource.

Mention of woodland in the later charters remained limited and retained the use of *silvis*, *terras arboles*, and *nemoris* when describing them. The only woodland that was confirmed, with the term *nemoris* along with *virgultis* (suggesting that brushland accompanied the woodland or that the wood contained the coppicing of willow, hazel, and alder), was at Inverarity.⁸¹ The presence of brushland at Inverarity is an important detail, as it could indicate a habitat more suitable for wild birds for hunting as well as possible winter grazing, depending on the actual vegetation. However, the exact vegetation cannot be known without further investigation into possible paeleoecological remains. Interestingly, specific mention of woodland within the barony of the Forest of Plantane only occurs after 1542,⁸² where it is described with both the terms *terras arboles* and *nemoris*, specifically located at Longbank.

⁸¹ RMS, ii, no. 1938.

⁸² RMS, iii, no. 3231. This study has mostly looked at sources between 1449 and 1542, and although this specific reference goes beyond these dates, it is entirely possible that woodland was mentioned prior to 1449.

A.4.2.1.f: Parks

The most common term used to convey a park in the Latin texts is a declined form of *parcus*. The use of this particular term appears to be a bastardisation of a German term for enclosed land, as a direct translation in Latin would suggest an adjective referring to frugal or slightness. Still, there is an indication of limitedness. The popular understanding of medieval parks related to their function in providing a space for hunting deer, hence the deer-park terminology. However, it has become evident that the park area provided a space that was much more versatile and essential to noble society than simply providing a place for hunting. Instead, the term is more appropriately defined as an area of land that is reserved and set aside for a specified purpose.⁸³ The park's reserved nature contrasts starkly with the idea of a commons but the type of land use, including types of agriculture, grazing, industrial production, and some elements of recreation, were not altogether different. Recreation activities have been frequently represented in art and literature. However, it is likely that these uses relate to the legal implication of land under imparkment, or setting legal restrictions of park management to a specific land, as well as the visible confinement of the area provided by some form of fence or wall.

An exact specification of how land within the imparked area was used, especially in Scotland, is limited to some sixteenth century indication from royal accounts and it is very obvious that this was a heavily managed and designed landscape. There has been a significant amount of research done on English castles to define both the

⁸³ R. Liddiard, *The Medieval Park*, p. 1.

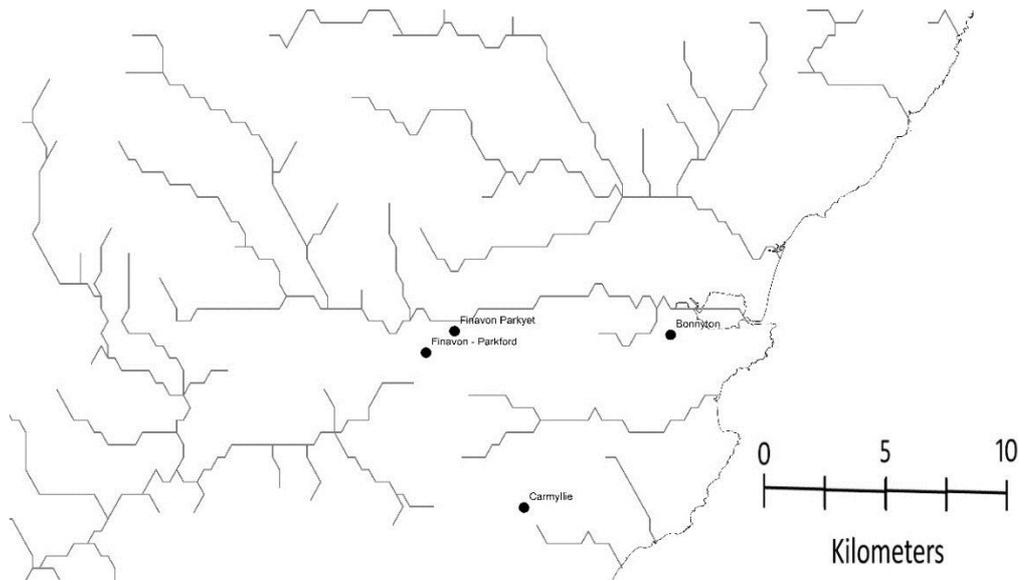
spatial and social relationship of park land in an aristocratic society and in the direct vicinity of the castle landscape. In many cases, there was a direct visual connection between these spaces. Hunting was one of many activities but it was not always the primary use (certainly not for all parks). As with any other multi-use site, there is no reason to deny that some parks were designed with a specific emphasis on hunting, grazing, or timber production but all of these sites were also used for other purposes. In many cases, the confinement of this space made it a desirable place to accommodate fishponds, rabbit warrens, or dovecots.⁸⁴ Imparked land served as defined areas of production for economic gain and for aesthetic value. It was seen as part wild, part controlled and a stepping stone between the confines of anthropogenic garden enclosures and the unconfined forest where much more hunting might have taken place. In some cases, there was more than one park: a small one close to the castle to be viewed and a larger one further out that was intended for larger-scale functions.⁸⁵ One of the main features that have been identified in England and Ireland is the association of parkland and timber production, particularly oak. A similar association in Scottish parks is evident from the records of Darnaway, Cadzow, and Longmorn,⁸⁶ though further archaeological investigation is currently underway.⁸⁷

⁸⁴ M. Murphy and K. O'Connor, 'Castles and Deer Parks in Anglo-Norman Ireland,' *Eolas: The Journal of the American Society of Irish Medieval Studies*, 1 (2006), pp. 59, 61.

⁸⁵ D. Wilson, 'Mutli-Use Management of the Medieval Anglo-Norman Forest', *Journal of the Oxford University History Society*, 1 (2004), pp. 1-16; C. R. Young, 'Conservation Policies in the Royal Forests of Medieval England', *Albion: A Quarterly Journal Concerned with British Studies*, 10 (1978), pp. 95-103.

⁸⁶ A. Crone, 'Native Tree-Ring Chronologies From Some Scottish Medieval Burghs', *Medieval Archaeology*, 44 (2000), p. 201-216.

⁸⁷ Forthcoming excavation report of Kevin Malloy and Derek Hall.



Map A.4.10: Sites Documented as Having Parks

Given the significance of parks to medieval noble society, it seems significant that there is only one contemporary document that mentions a park at an Angus castle: at Bonnyton. The document describes Bonnyton's grain and fulling mills, woodland, fresh and salt water fishings, and a chapel.⁸⁸ The only other indications within Angus of parks are found within the place names surrounding Finavon, Parkford, and Parkyet, which make it a great site for future case study research. As parkland was a significant symbol of power during this time, the lack of documentation compared to the overwhelming documentation for mills and fishings seems odd. This lack, however, could be because parks were expected at a certain type of property, whereas specific mention of resources that were the foundation of lordly income, including mills and fishings, was crucial for effective legal documentation. There is some later evidence for parks in this area at properties which would have merited a

⁸⁸ *RMS*, iii, no. 2693 (p. 623).

park even in the fifteenth century, such as the seventeenth century references at Brechin, Panmure, and Kelly.⁸⁹

A.4.2.1.g: Gardens and Orchards

Another feature common to the noble landscape was the garden, a feature that likewise had productive, symbolic, and entertainment functions. Both Colvin and Johnson suggest that gardens were primarily the domain of the noble women, as a place for social interaction.⁹⁰ However, Colvin would likely argue that there is a distinct difference between the Latin terms *herbarium* and *gardina*.⁹¹ This distinction in turn suggests that the *herbarium* is more of a grassed area with benches for sitting, whereas the *gardina* produced flower, herbs, fruits, and vegetables that could be viewed and then later eaten from the lord's tables.⁹² It is possible that the earlier record of gardens were drawing specific attention to their existence, either because of the need to draw legal attention to their presence on the property or, as Hewer suggested, the term *ortis*, the more commonly used term for garden in Scotland, referred to a grander landscape feature (perhaps for pleasure) and it is only later that the term might refer to a more common kitchen garden.⁹³ The creation of a designed

⁸⁹ National Records of Scotland, RHP35168, Plan of Brechin Castle.

⁹⁰ H.M. Colvin, *Royal Gardens in Medieval England* (Washington, 1986); M. Johnson, *Behind the Castle Gate: From Medieval to Renaissance* (London, 2002).

⁹¹ H.M. Colvin, *Royal Gardens in Medieval England* (Dumbarton Oaks, 1986), p. 26.

⁹² E. B. MacDougall, *Medieval Gardens* (1986), p. 13.

⁹³ S. Hewer, 'From Renaissance to Baroque? Re-Ordering the Setting of the Scottish Country Seat c. 1640-1700', *A New Platform for Scottish Renaissance Studies*, (Perth, 2013) [unpublished conference paper].

ornamental garden was a later sixteenth century development, held within a wall or enclosure of hedge or ditch, close to the castle structure. This allowed the garden to be viewed from the castle itself and provided some degree of separation, ensuring privacy, prevention of trespass, or protection from the wind. The cultural symbolism of medieval gardens was one that was both a religious reminder of the purity and holiness of the Virgin Mary, marriage, or one of profane or illicit relationships between people.⁹⁴ The popularity of ornate gardens on the continent made the garden's design and plants a fashionable display, visible from many points of the castle complex. Although in many cases there was a clear separation of the kitchen garden and the ornamental garden, it is hard to locate the difference at some locations. Accounts from the Exchequer Rolls suggest that seeds of onion, lettuce, and scallions were sent out for the gardens of some castles. The excavations at Paisley Abbey have revealed that the gardens consisted of plants that served as both medicinal and as culinary seasoning.⁹⁵

The latin term *pomerium* is used to indicate the orchard, which might have not been physically separated from the gardens in all cases, but were considered a separate type. Orchards, like gardens, were able to provide the aristocratic landscape with a feature that was both productive and displayed any new and fashionable 'imported' goods. Walnut trees were imported into Scotland by around the sixteenth century, so it is likely that the earlier orchards held fruits such as apple, pears, or plums. In many

⁹⁴ M. Brown, *Scotland's Lost Gardens: From the Garden of Eden to the Stewart Palaces* (Edinburgh, 2012), p. 61.

⁹⁵ C. Dickson, 'Food, Medicinal and Other Plants from the 15th Century Drains of Paisley Abbey, Scotland', *Vegetation History and Archaeobotany*, 5 (1996), p. 25.

cases, the garden and the orchard were connected, as discussed by Brown.⁹⁶ In some cases, the orchards had their own enclosure that was separate from the other enclosed features in the landscape.⁹⁷ In some cases of the investigation of latrines in English castles revealed pollen evidence that suggested hedges around the orchard was most common.⁹⁸ This characteristic was often one of the many features that were meant to be seen and often castles were built to accommodate the viewing of these landscapes from the central structure itself or from a specialised ‘viewing’ tower.⁹⁹ The depiction of Finavon in Pont 26 seems to suggest a similar viewing arrangement.¹⁰⁰ Hayes suggests that orchards were imported by monks in the twelfth century and spread into elite culture, becoming an important part of the noble landscape, for both productive and aesthetic reasons. In fact, the area around the Tay, particularly the Carse of Gowrie, has been an extensive place of fruit cultivation for a long time.¹⁰¹ The ‘apple gate’ and humic loam at Arbroath Abbey suggest the presence of orchards.¹⁰² Orchards were also a multi-use landscape and could be used as a resource for some building materials and as pasture at certain times.¹⁰³

⁹⁶ M. Brown, *Scotland's Lost Gardens*, p. 61.

⁹⁷ F. W. Robertson, ‘A History of Apples in Scottish Orchards’, *Garden History*, 35 (2007), p. 38.

⁹⁸ J. Greig, ‘The Investigation of a Medieval Barrel-latrine from Worcester’, *Journal of Archaeological Science*, 8 (1981), pp.265-282; L. Moffet, ‘Fruits, Vegetables, Herbs and Other Plants from the Latrine at Dudley Castle in Central England, used by the Royalist Garrison During the Civil War,’ *Review of Palaeobotany and Palynology*, 73 (1992), pp. 271-286.

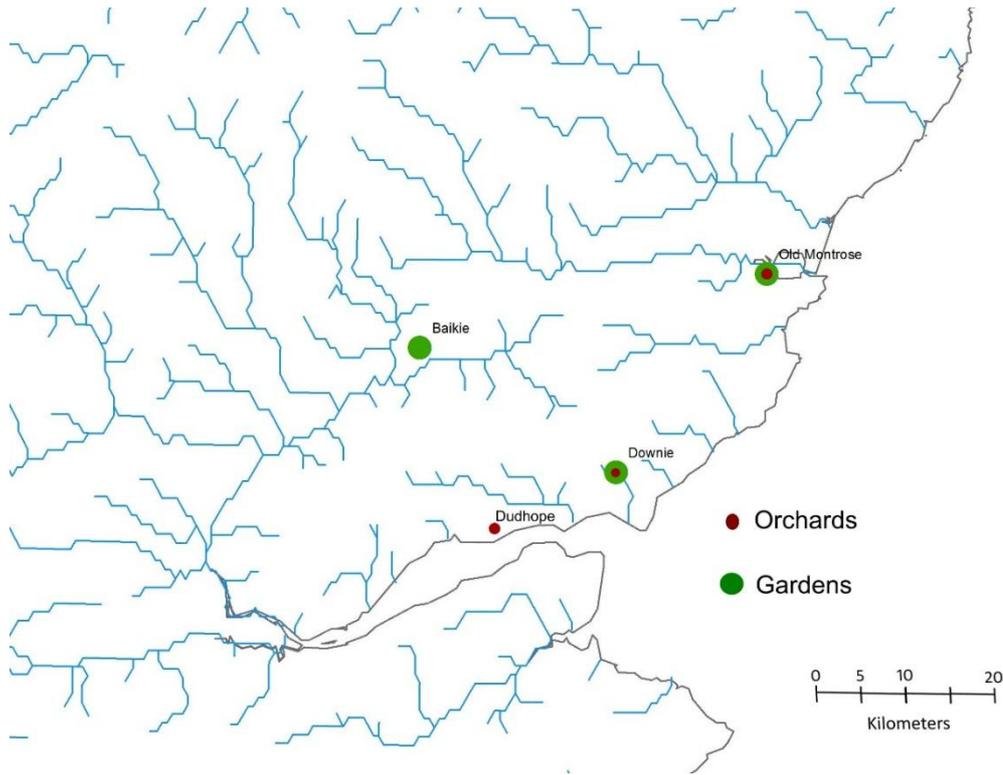
⁹⁹ C. Taylor, ‘Medieval Ornamental Landscapes’, *Landscapes*, 1 (2000), pp. 38-55.

¹⁰⁰ See the image in Appendix A, p. 403.

¹⁰¹ C. W. Hayes, ‘Ancient Orchards on the Banks of the River Tay’, *Orchards and Groves: Their History, Ecology, Culture and Archaeology*, 7 (2008), p. 63.

¹⁰² J. Lewis, ‘22-26 East Abbey Street, Arbroath, Angus (Arbroath and St Vigeans parish), Evaluation’, *Discovery Excav Scot*,8 (2007), p. 31.

¹⁰³ A. Crone and F.J. Watson, ‘Sufficiency to Scarcity: Medieval Scotland, 500-1600’ in T.C. Smout (ed.) *People and Woods in Scotland: A History* (Edinburgh, 2003), p. 61; C. Dyer, *Gardens and Orchards in Medieval England* (London, 1994).



Map A.4.11: Sites with Documented Gardens and Orchards.

Although gardens and orchards were seen as a significant commodity, providing both sustenance and leisure grounds, it is not surprising that they were not frequently referenced in contemporary documents. There are only four places that are listed as having gardens or orchards. Montrose and Downie are listed as having both. Baikie is listed with only a garden and Dudhope is listed with only an orchard.¹⁰⁴

The lack of reference to commonplace features of resources perhaps explains the lack of references to beehives, an essential element of healthy and productive gardens and orchards, not to mention valuable for their wax and honey. The use of honey and wax by medieval noble society automatically suggests that healthy and productive beehives were a significant feature in the elite landscape. Average honey

¹⁰⁴ *RMS*, iii, no. 470.

production before recent climate change in Sweden was 10.5kg per hive.¹⁰⁵ Certainly honey was important as a sweetener, for medicinal uses, and occasionally as a preservative but the more important by-product of the bees was wax. Beeswax was especially important in ecclesiastical contexts, where candles were required to be made from this commodity.¹⁰⁶ It was also employed for candles and seals used by the nobility. Some studies related to beekeeping in Ireland, England, and Scandinavia provide insights on how this valuable resource was used in Scotland, where references to beekeeping or beeswax production is largely missing from the records. It seems reasonable to assume that Scotland was working under a fairly similar system as in neighbouring countries. Early legal tracts in Ireland such as the *Bechbreatha* suggest that it was equally common to have bees close to a dwelling as far away, as long as they were within close range of a food source.¹⁰⁷ In fact, if the bees were non-aggressive, it might have been preferable for the hives to be kept within the garden, as the penalty for stealing them from a garden or courtyard was far greater than stealing them from pasturage some distance away.¹⁰⁸ The parliament of James V in 1535 also specifies that stealing hives (or bees from the hives) was a punishable theft, along with harming park, dovecots, rabbit warrens, or fishponds and taking the doves, deer, rabbits or fish belonging to them.¹⁰⁹ This document not only highlights the importance of these features, but also that their theft was an issue.

¹⁰⁵ E. Husberg, 'Honey, Beeswax and Mead: Beekeeping in Sweden during the Middle Ages and the Sixteenth Century' in E. Husberg, *Honung, vax och mjöd : biodlingen i Sverige under medeltid och 1500-tal* (Gothenburg, 1994), p. 397.

¹⁰⁶ J. Singman, *Daily Life in Medieval Europe* (Westport, 1999), p. 47.

¹⁰⁷ C. Edwards and Kelly, eds. *Early Irish Law Series Volume 1: Bechbreatha* (Dublin, 1983), p. 45.

¹⁰⁸ *Ibid*, p. 85.

¹⁰⁹ *RPS*, 1535/20.

An understanding of the benefits of having bees in a garden or orchard was certainly present in medieval gardening culture. It seems likely that bee hives would have been kept in close proximity of flowering resources, such as gardens, orchards, and possibly the reserved land in the park, depending on what resources were being managed. In Scotland during the early sixteenth century, the only references to keeping bees are on the lands of the Earl of Moray on Orkney and Shetland, and Strathearn.¹¹⁰

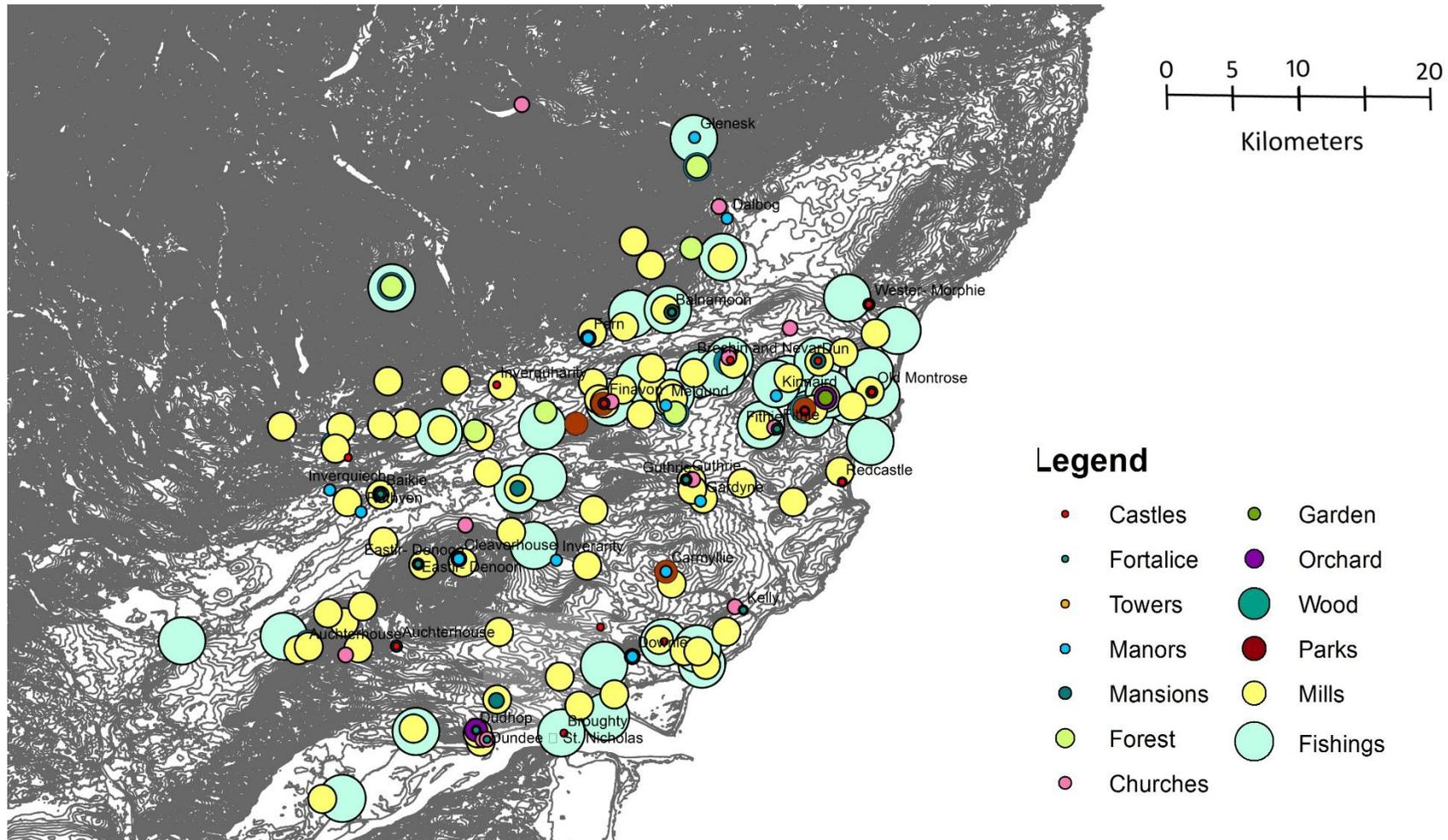
In summary, using contemporary documents to create a picture of the noble landscape of Angus has highlighted many important points. First and foremost, the material reviewed in this chapter has revealed that terms used to describe noble residences (castle, fortalice, tower, manor-house, and mansion) were inconsistently applied to any of the structures. A variety of combinations of these terms (or used alone) was associated with at least thirty seven noble residential sites within Angus [See Map: Feature List].¹¹¹ Tenement lands, which had the potential for having structures on them, were also very common. The most commonly referenced resource features that were connected to noble residences were mills and fishings. Although other features were likely to have been visually prominent in the landscape, fishings and mills were key economic resources, perhaps making rights to their produce more important within the context of legal documentation. It seems that, in the context of these charters, it was less necessary to explicitly mention other features of intensive resource management. It is possible that these features were too

¹¹⁰ *RMS*, iii., no.988. There is an interesting list of what was to be included in this new castle building operation – hall, chamber, kitchen, barn, cattle-shed, dovecote, orchard, pond, and beehives.

¹¹¹ This is an approximation, as places such as Glamis, a major elite residence during this time, was not actually referred to by any of these terms in contemporary documents; it was termed simply Glamis. It is only in later documents that it is identified as a castle or manor.

commonplace to be mentioned or were assumed to be a part of the landscape of a property of a higher status. It is only through the limited documents that provide some details of the contents of the property that a list, though incomplete, of what was within these properties is possible to construct. In some instances, the features mentioned are not dissimilar to the features of noble status identified by Creighton and others in an English or mainland European context, embracing gardens, orchards, woodland, forest, and parks. The list for Angus differs in the emphasis on mills and fishings and the relative scarcity of pre-1542 references to dovecots or rabbit warrens.¹¹² Although these were not absent from Scotland, they were infrequently documented. To rely solely on the surviving contemporary documentation would leave us with a picture of the economic landscape of nobility in medieval Angus that omits most of the known everyday resources that were exploited and the interactions of noble households with the landscape surrounding the elite residence.

¹¹² A dovecot is mentioned in Angus at Inverarity in *RMS*, iii, no. 2521.



MapA.4.12: Feature List

A.4.2.2: Extensive Management¹¹³

Many of the material requirements for common tasks in medieval Scotland come from land which was extensively managed, such as moors, mosses, and pasture. Contemporary evidence points to these only existing within the forest of Lisdin, though this was certainly not the only one in existence in Angus.¹¹⁴ Following the same logic as the intensively managed properties, their constant presence perhaps made them unworthy of mentioning under most conditions in which the surviving charters were written. As most of these extensively managed properties were wet land features, a modern assessment of where these land types exist is neither feasible nor helpful, due to extensive draining that has created a much dryer landscape. However, there are many later documents that list these features within the landscape, along with more intensive features, allowing for a more complete picture of landscape features and land use. Roy's maps, for example, show the landscape prior to the great period of improvement, so many of the wetlands still remain within his representation of land-use. A certain amount of caution must be exercised with back dating, as some of these features will have changed, even before eighteenth century documentation was made. For example, the loch in which Baikie Castle stood has already been drained, leaving a significant amount of moss land.¹¹⁵ An earlier landscape would have contained an equal or greater amount of wet land, so later details of moss and moors can be reasonably, retrogressively attributed to the late fifteenth and early sixteenth century.

¹¹³ For the purposes of this thesis the term extensive refers to the farming technique: 'Applied to methods of cultivation in which a relatively small crop is obtained from a large area with a minimum of attention and expense.' Oxford English Dictionary, 'Extensive', <http://www.oed.com.ezproxy.stir.ac.uk/view/Entry/66943?redirectedFrom=Extensive&>. [Accessed 1 September 2014].

¹¹⁴ *RMS*, iii, no. 2150.

¹¹⁵ A, Jervise, 'Notice of Antiquities in the Parish of Airlie, Forfarshire', *Proc Soc Antiq Scot*, 5 (1865), p. 347.

Other resources such as mosses, moors and pastures are more commonly recorded in later documents, especially those relating to the ‘improvement’ of the property. One such case occurs at Finavon in 1641, where arrangements were made to drain the moss belonging to the property called ‘ye red mosse.’¹¹⁶ Although there is not much detail in the description of the ‘Red Moss’, its presence confirms the presence of fuel resource in peat for the community. Although not always mentioned, extensively managed resources were probably part of the medieval economic landscape, given the presence of the right topographical and environmental conditions. As these features cannot be proven to exist where no documentary record survives and where the landscape has been extensively modified, they will not be added to the dataset unless other evidence is found for them, such as in the case of Finavon or at Fern, where mention of moor and pasturage is also found.¹¹⁷

Mosses were used for many purposes, only one of which was as fuel sources; another was as water-fowl habitat. The ways in which these lands were used, however, were many and overlapping. For example, moss, meadows, and moor could have been used for pasture but land used as pasture was also a separately identified landscape feature. Three types of pasture lands were used in medieval Scotland. The first was land permanently set aside for continual use. The second was used seasonally and could be moor, heath, bog, or high-mountain grazing, often consisting of areas where there was a large population of gorse. The third type was woodland pasture and had many

¹¹⁶ National Archives of Scotland, Papers of the Earls of Airlie, GD16/24/94a; GD16/24/94b, Miscellaneous Charters, 1399-1885.

¹¹⁷ *RMS*, ii, no. 1938.

implications for management regimes.¹¹⁸ Woodland pasturage was particularly suitable for oak forest, thus pigs (for pannage) and cattle were pastured in woodland. The undergrowth in these areas was kept low, so they were not a suitable habitat for deer.¹¹⁹ In the English *Inquisitiones Post Mortem* (legal inquiries made into the lands owned and subsequent inheritance rights after a landholder died) medieval land-use map, pasturage was identified as a component of arable, herbage, meadow and grassland, where pasturage value seems to be focused on high grazing ground.¹²⁰ There were many pastures with restricted use but some of this land would have been for the common use of the community.

One of the key steps in establishing the location of such landscape features involves proving land use continuity. After 1542, charters remain a significant resource in providing information about the properties. Although it is probable that some of these features have been moved over time, the longer a site can be identified as having such a feature, the more likely the location found later is at least close to the earlier position. This is perhaps most obvious when discussing the location of the noble residences themselves, which are typically built and rebuilt on, or very near to, the same location as the previous structure, such as in the case of Edzell where the possibly twelfth- or thirteenth-century motte is within view of the early sixteenth-century tower. It is equally as likely that the location of a mill will have remained the same, even if the structure and technology has been updated over time. Similarly, it is likely that fishing

¹¹⁸ H. Jäger, 'Land Use in Medieval Ireland', *Irish Economic and Social History*, 10 (1983), pp. 51–65.

¹¹⁹ D. Wilson, 'Multi-Use Management of the Medieval Anglo-Norman Forest', *Journal of the Oxford University History Society*, 1 (2004), pp. 4-7.

¹²⁰ K. Bartley and B. M. S. Campbell, 'Inquisitiones Post Mortem, GIS, and the Creation of a Land-use Map of Medieval England', *Transactions in GIS*, 2 (1997), pp. 337-338.

cruives remained in the same or a similar location, despite being altered and updated technologically as well as requiring to be reconstructed, perhaps after every spate episode. Cruives require some adjustment to the river flow in order for them to work effectively and they would, of course, have been modified as the water flow changed. Such changes could come about as a result of other socio-economic activities, like draining and embanking lands that had served as flood-plain or straightening of the river to accommodate further development. In some cases, however, these adjustments to the flow of the river may have taken into account the water flow for mills and fishings. Nevertheless, the closest approximation to finding the location of some of these features without some level of archaeological survey is in establishing continuity in the presence of a feature into a time when some physical location has been documented. A full discussion of the determined location was given in Chapter Two, where this data is linked to the geographical and topographical record.

In summary, although the addition of documentary evidence does provide a greater understanding of certain features in the landscape, there is still an incomplete understanding of what the landscape around the noble residences contained. There are significant benefits, however, to incorporating information from later periods; this involves demonstrating a clear line of continuity of the presence of certain landscape features from the 1450-1542 period covered by this project and the later dates, when information about the location is mentioned. This is particularly useful in linking the information gained from these documents to the geographical and topographical space discussed in Chapter Two.

Nevertheless, the documentary evidence does reveal a significant amount of information about the late fifteenth and early sixteenth century terms used for the noble residences in Angus and some of the features within the landscape (the attribute information for the noble residences essential for allowing them to be assessed through spatial and network analysis). The list of these attributes is found in Table A.4.1.a - d and can also be seen in Map A.4.12. The most numerous production features identified were the mills and fishings, which also have been the easiest to identify with a corresponding location. Thus, for Chapters Five and Six, these will be the features used to identify any spatial relationships. Chapter Seven will return to the full list of features provided here to identify any links between the feature arrangements at the noble residences. Although this survey has not provided a fully detailed picture of landscape of late fifteenth and early sixteenth century Angus, it does provide valuable information for future research and is an excellent place to start thinking about what sort of connections and relationships, both spatial and social, were being expressed within this context of noble residences.

Chapter 5: RA and RRA Value Assessment

The connection between how humans live and the spaces in which they do so is an important relationship explored in many anthropocentric studies. Deep psychological connections to our surrounding environment are present at the earliest stages of development in relation to familiarity, security, and trauma.¹ Aspects of surrounding spaces, especially climate and topography, have always influenced how and where humans live. Equally, humans have shaped the forms of spaces, whether structural or landscape, in order to suit a specific way of life. This has occurred on many different levels; from broader social and cultural demands, down to an individual's preferences and desires.² Therefore, there is a reciprocal relationship between the formation of both human society and the spatial environment in which it exists. Out of the study of the clear relationship between human society and its surrounding space, a discourse currently described as 'space syntax' has developed. Space syntax can be divided into numerous forms but the overall aim of its research is to 'develop strategies of description for configured, inhabited spaces (of buildings, settlements or built complexes) in such a way that their underlying social logic can be enunciated.'³

One of the most popular methods through which a spatial syntax is employed has been to transfer an exact representation of the space in question into a topological

¹ S. D. Clayton and S. Opatow (eds.), *Identity and the Natural Environment: The Psychological Significance of Nature* (Cambridge, 2003).

² A. Goudie, *The Human Impact on the Natural Environment: Past, Present, and Future* (Malden, 2006).

³ S. Bafna, 'Space Syntax: A Brief Introduction to Its Logic and Analytical Techniques', *Environment and Behavior*, 35 (2003), p. 18.

representation of spaces and connections (typically represented in a graph), which subsequently reveal patterns of privacy and control. The topological representation of the site in question is often assessed based on the depth, or number of spaces (nodes), between the originating space and the node in question. Based on the depth of each space, its level of integration in relation to all the other spaces of the site is determined, which Hillier and Hanson term a *relative asymmetry* value (hereafter RA). However, it is important to note that in their discussion of the RA value, Hillier and Hanson do not make it clear that the RA value of each node within the system, in relation to every other node in the system, is required in order to properly calculate the mean RA value of the site. This relationship to every site is made clear by Sherlock and Bafna.⁴ The RA value (the calculation of which is described in B.5.1) is a ratio that cannot exceed the maximum possible depth value within the site and, therefore, is represented as a value between 0 and 1. The level of integration within the studied site is often interpreted as a level of accessibility and privacy, subsequently interpreted as directing and controlling social encounters or being directed and controlled.⁵ Although mostly used to assess domestic space in structural developments, these elements of integration, accessibility and control are easily transferred to an assessment of a site consisting of multiple structures and important features within its parameters.

The intrinsic significance of the RA value is to address the relationship of each feature, or node, within the system of nodes contained within the site, which is micro-scale in nature. Although micro-scale itself is an important scale of focus, further benefits arise

⁴ R. Sherlock, *The Social Environment of the Irish Tower House*, Department of Archaeology NUI, Galway (2008), p. 159 [unpublished PhD thesis]; Bafna, 'Space Syntax', p. 25.

⁵ J. Shapiro, 'Fingerprint in the Landscape', p. 1.

when the site is compared with other similar, though not identical, sites. A problem with this scale is that not all similar sites have exactly the same number of nodes within their systems. The need for meso- or macro-scale comparison and, equally, the problem of comparing two sites with a different number of nodes was identified by Hillier and Hanson. Their solution was to create a *real relative asymmetry* value for a site based on the mean RA value and adjusted to take into account the potential variation of spaces. This procedure was done by creating a ratio of the RA value of the site and the RA value of a central node in a diamond graph⁶ made up of the same number of nodes as the site.⁷ As this ratio is not necessarily confined by the constraints of the maximum depth value of a node in the system of the site, the values can exceed 1. Rather than giving an extensive explanation of how this is calculated, Hillier and Hanson provide a table of RA values from the diamond graph which they call a *D value* based on the number of nodes in the site being studied.

B.5.1: Method: RA and RRA Values

RA values are centred on finding the depth of a node within a system. Depth is determined by how many steps or spaces there are between the grounding points of the spatial data. The relationship between the originating point and another point is shallow if there are few spaces between them and deep if there are many, ‘the least depth existing when all spaces are directly connected to the original space, and the

⁶ A diamond graph is a planar unidirectional graph containing 4 vertices and 5 edges (radius 1, diameter 2, girth 3, chromatic number 3, and chromatic index 3).

⁷ Bafna, ‘Space Syntax’, p. 25.

most when all spaces are arranged in a unilinear sequence away from the original point.⁸ The measurement of depth is not based on the size or shape of the spaces involved, but simply that a space is present and is passed through to reach another space. Therefore, it provides an opportunity to assess identified spaces, though specific details might not be known.⁹ RA values are designed to represent the total depth potential of a system, taking all possible depths into account. In order to accomplish this calculation the mean of the depths of each room needs to be identified. After each space is given a depth value based on the number of steps between it and the original point, the following formula is used to determine the Mean Depth (hereafter MD):

$$MD = \frac{\text{sum of depth values}}{k - 1}$$

The value of k is the total number of spaces because the RA value is relational to other spaces; the original point is subtracted to get the MD.¹⁰ The RA value can then be determined using the following:

$$RA = \frac{2(MD - 1)}{k - 2}$$

The resulting value will be between 0 and 1. Lower values designate shallow or integrated systems, whereas higher values designate deep or segregated systems.

Within the context of a structure, ‘shallow’ spaces (i.e. rooms which lie close to the

⁸ Hillier and Hanson, *Social Logic of Space*, p. 108.

⁹ At this point the author would like to stress that an understanding of the dimensions of a space being assessed is very important, and when possible, should be used in assessment. However, it is understood that this is not always possible, especially when dealing with older archaeological remains.

¹⁰ It is important to note here that the MD is focused on the base number of nodes and therefore $k=7$ at this point. The RA values and RRA values are complete system inclusive, and therefore have a much higher k value.

entrance) are less likely to serve ‘private’ functions than ‘deep’ spaces (i.e. rooms which lie at some remove from the building’s entrance),’ as stated by Sherlock.¹¹

One of the key issues in using these numbers to compare distinct sites with different numbers of spaces is the different ratio for which each RA value is calculated, making it only useful to compare the values of equally sized sites. In order to compensate for this deviation, each RA value must be calculated with the RA value of the root (D), or the shallowest space possible within that system, taken into account. This finding has been called Real Relative Asymmetry (RRA) by Hillier and Hanson, sometimes termed the integration value,¹² as is figured by the following formula:

$$RRA = \frac{RA}{D_k}$$

Hillier and Hanson provide a table of D values for systems with spaces numbering 1 to 300, which has been used by Sherlock to determine RRA values.¹³ However, no value is listed for systems with less than five spaces. The D values listed by Hillier and Hanson used for this study can be found in Tables B.5.1-7.

¹¹ R. Sherlock, *The Social Environment of the Irish Tower House*, p. 158.

¹² Shapiro, ‘Fingerprint in the Landscape’, p. 6.

¹³ Hillier and Hanson, *Social Logic of Space*, p. 112; Sherlock, *Social Environment*, p. 162.

B.5.2: Sites Used for this Study

For this study, it is important to clearly identify certain terms. The use of the term *site* refers to the named noble residence and the associated features within its surroundings, the demesne property. The term *system* denotes the referred site but with specific reference to the relationship between the identified features. *Nodes* represent the identified features within the site in question which represent the spaces of the system of interaction, including the noble residence, fishings and mills. *Steps* refer to the defined measurement of distance between nodes of a system.

Adjusting this method, which has primarily been used to assess buildings or closely confined sets of convex spaces within a settlement, has required some alteration, in which each site is defined into a system of nodes. For the application of RA and RRA analysis within this data set, seven sites have been chosen that each have a reference to a mill and fishings as part of the makeup of their surroundings. Other properties have many other associated features listed, such as gardens and woodland, but there is no locational evidence to estimate the exact position of these features. The main reason for this qualification is based on the need for the topological spaces discussed within RA and RRA value analysis to be based on identifiable physical space. For each of these sites, there is some evidence for the physical location of both the mills and fishings mentioned in the documents. Most of these properties have associated mills indicated on later cartographic sources and it is likely that the mill sites retained some continuity in location, barring major hydrographic changes. Although the exact boundaries of the fishings are not known for most of these properties at this date, it is

likely that they existed within close proximity of the nearest water to the noble residence. There are some indications of exactly which water the fishings are on within the documents and, sometimes, specification of both salt and fresh water, suggesting the location within the waters most likely to be part of the fishing, as at Bonnyton.¹⁴ However, a fishing is a long stretch of river and its spatial relation to the noble residence could change whether the geographical point addressed was a distant or close part of the river. To compensate for both the non-specific location of the fishings and the possible distinct differences between the distances along the stretch of river where the fishings could have been, five random points along the predicted stretch of water have been included in this study. Including the location of the noble residence, this has provided seven base nodes that create the system for each site.

It is important to note that these systems are based on these seven defined nodes but do not necessarily have the same number of total nodes within each system. Within standard graph assessment, each room or convex space would be represented as a node on the graph, marking a set measurement of distance (a room) between these nodes for how they are accessed. The definition of how distance and separation are defined as a space is vital to understanding how the interaction of rooms within a system is expressed through RA and RRA values. This study expands the data set to include nodes that are scattered across a large area of 'undefined' space, and, therefore cannot use the same measurement of distance. Specific access routes between places are often unknown, so a Euclidian line has been presumed. It is important to emphasise what is known, which for this study is the physical distance between the projected base nodes

¹⁴ *RMS*, iii, no. 2693.

and the originating node (noble residence). The physical distance must be allowed to direct the expression of interaction between these spaces and, in order to do this within the context of this study, a set measurement of 50-metres squared has been applied to define spaces of distance between nodes for how they are accessed (or steps). This has been chosen to account for the distances of both the features that are close to the noble residence but not necessarily in its immediate grounds and those lying at a greater distance. A 50- metre square grid has been placed over the maps to demonstrate the creation of this type of space, which allows the known distances between the nodes of the system to affect how their interaction with the noble residence and other nodes is expressed and assessed within the RA and RRA values.

Each site description features both a map indicating the locations of the nodes within this system and the 50-metre square grid to denote steps based on Euclidian line-measured distance. A table which denotes the steps for interaction between each base node in the system and the corresponding RA and RRA values is also present. Section B.5.2.a-g assesses each site individually, according to their RA values, on how each feature relates to the system it is in. The values directly related to the discussion of each site's RA values are highlighted in green in the table. Typical RA value rhetoric refers to the depth of a node and how this depth relates to other nodes in terms of privacy and being controlled or controlling spaces. This study looks at accessibility in terms of integration with the system but does not carry this integration into an element of privacy, given that the nodes are elements of a surrounding environment. Therefore, the higher the RA value the less integrated the node is, whereas the lower the RA value the more integrated the node is to the system. Section B.5.3.a addresses how these sites compare to each other, looking at the RRA value and expanding focus to cover a larger

view of site assessment based on integration with surrounding features. The values directly related to the discussion of each site's RRA values are highlighted in orange.

B.5.2.a: Airlie

Airlie Castle occupied a naturally highly-defensible position on the 30-metre high promontory formed by the confluence of the Melgam Water with the River Isla.¹⁵ The property of Airlie was one of many acquired by Sir Walter Ogilvy of Lintrathen and represents one of the few castles where evidence of a royal licence to crenellate (in 1432 by James I) has survived. It was termed the seat of a barony and as a fortalice by the 1450s but the term tower was not applied to the property in the documentary record until 1566. From the surviving remains, the castle is presumed to have been originally an oblong quadrangle in form, enclosing the western extremity of the headland, but the only structural remains of this enclosure is the wall on the east side of the courtyard.¹⁶ Sketches of Airlie are found in both Pont 26 and Pont 28, but a fully detailed drawing is only found in Pont 29, where there appears to be one gate tower with stretches of wall on either side settled within the labelled 'wood of Airlie'.¹⁷ The wood is also noted in the 1678 Edward's map, though there is no mention of woods in the known document record of the dates of this project.¹⁸

¹⁵ MacGibbon and Ross, *Castellated Architecture of Scotland*, vol. 5, p. 216.

¹⁶ Warden, *Angus and Forfarshire*, vol. 2, p. 328.

¹⁷ National Library of Scotland, Adv.MS.70.2.9, Pont 26, 28, and 29 c.1583-96.

¹⁸ See Appendix A, p. 323.

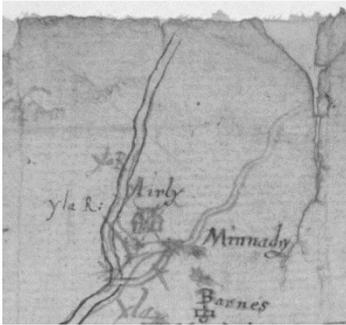


Figure B.5.1: Pont 26's Depiction of Airlie [Copyright NLS]¹⁹

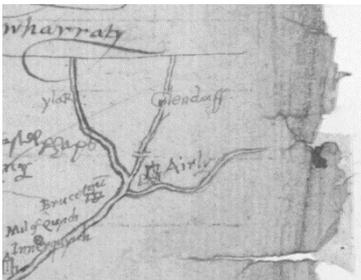


Figure B.5.2: Pont 28's Depiction of Airlie [Copyright NLS]²⁰



Figure B.5.3: Pont 29's Depiction of Airlie [Copyright NLS]²¹

¹⁹ Image covers approximately 2km².

²⁰ Image covers approximately 2km².

²¹ Image covers approximately 4.5km².

The castle was attacked and burned by Argyll in the 1640s and, although repaired after that event, most of the surviving structure is of post-1790s construction. MacGibbon and Ross suggested that the western end of the eighteenth century lodgings contain some elements of the early buildings of this castle, but more recent structural surveys have failed to identify any such remains.²² The fifteenth-century gatehouse, which is located towards the northern end of the surviving east curtain, was heightened into a tower at a later date, but it is uncertain if this or some other now-vanished component of the pre-1640s castle is the ‘tower’ of the 1566 description.

Due to the location of Airlie Castle at the confluence of two rivers, the location of the fishings has been determined by generating five random points along both of these rivers near the castle.²³ The extent of the furthest possible location of these fishings extends to the point where a mill-site has been identified. There is no specific mention of the location of the mill in the published pre-eighteenth-century records, but Roy’s 1747-52 survey names a ‘Mill of Airly’, which on Ainslie’s 1794 map is called Dryloch.²⁴ Warden mentions that the Airlie property was connected to the Dilvaird mill, just upstream at the confluence of the Canty Burn and the River Isla. Therefore,

²² MacGibbon and Ross, *Castellated and Domestic Architecture, Vol. 5*, p. 216; S. Forman, *Scottish Country Houses and Castles*, (Glasgow, 1967), p. 108.

²³ Following the research of MacManama-Kearin, this has primarily been within a 1km radius, unless there is clear evidence with source or geographical makeup that features were further away.

²⁴ For Ainslie’s map see Appendix A, p. 325; British Library, Maps K.Top.48.25-1.a-f, Roy, 1747-55; National Library of Scotland, EMS.s.356, Ainslie.

the location of the mill has been estimated at its furthest possible distance on the south bank of the modern location of the Mill of Cumno.

There is evidence of the property of Airlie being granted by the king from 1375, specifically in relation to the doorward service to the royal chapel.²⁵ In 1390 the lands were split, half being retained by Sir John Straiton and the other half given to John Guthrie. In 1432 Sir Walter Ogilvy of Lintrathen was given half the lands of Airlie with a licence to crenellate stating he can ‘erect his tower in the form of a castle’.²⁶ The half of the lands owned by Guthrie were not reunited under the Ogilvy holding until 1440, when Sir Walter Ogilvy of Lintrathen’s son, John Ogilvy was recipient of the resigned sub-tenancy lands.²⁷ During the time period of concern to this study, ownership of the property passed directly down the male line as is demonstrated by the squared outlined in green in the following Ogilvy family tree.

²⁵ *RMS*, i, no. 579, no. 620, no. 714.

²⁶ National Library of Scotland, Papers of the Earl of Airlie, GD16/1/1, License under Sir Walter Ogilvy of Lintrathen, 1431.

²⁷ National Library of Scotland, Papers of the Earl of Airlie, GD16/1/2, Resignation by George of Guthry, 1440.



**Figure B.5.4: Roy's Map of Airlie [Copyright British Library Board
(K.Top.48.25-1.a-f)]**

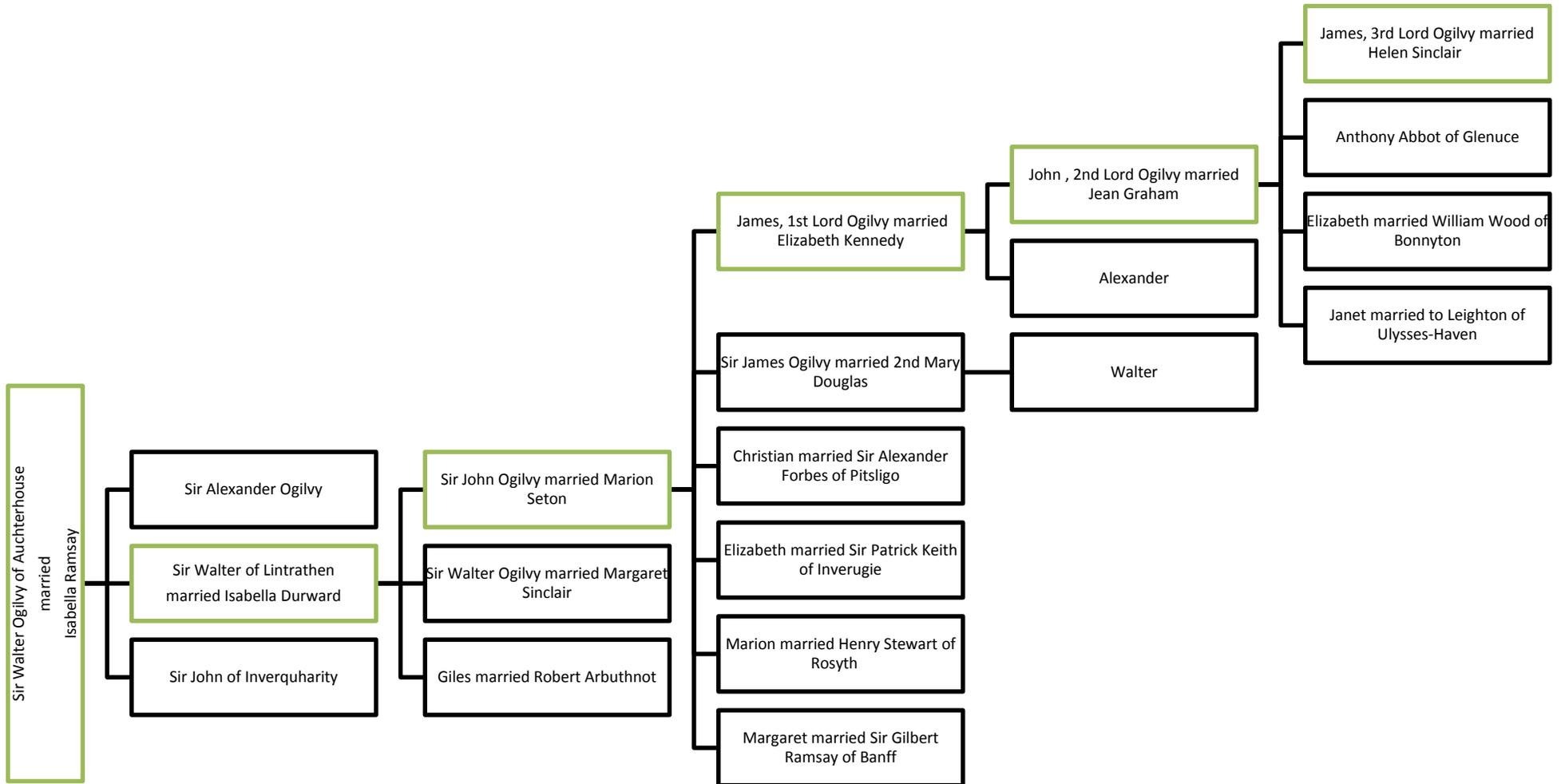
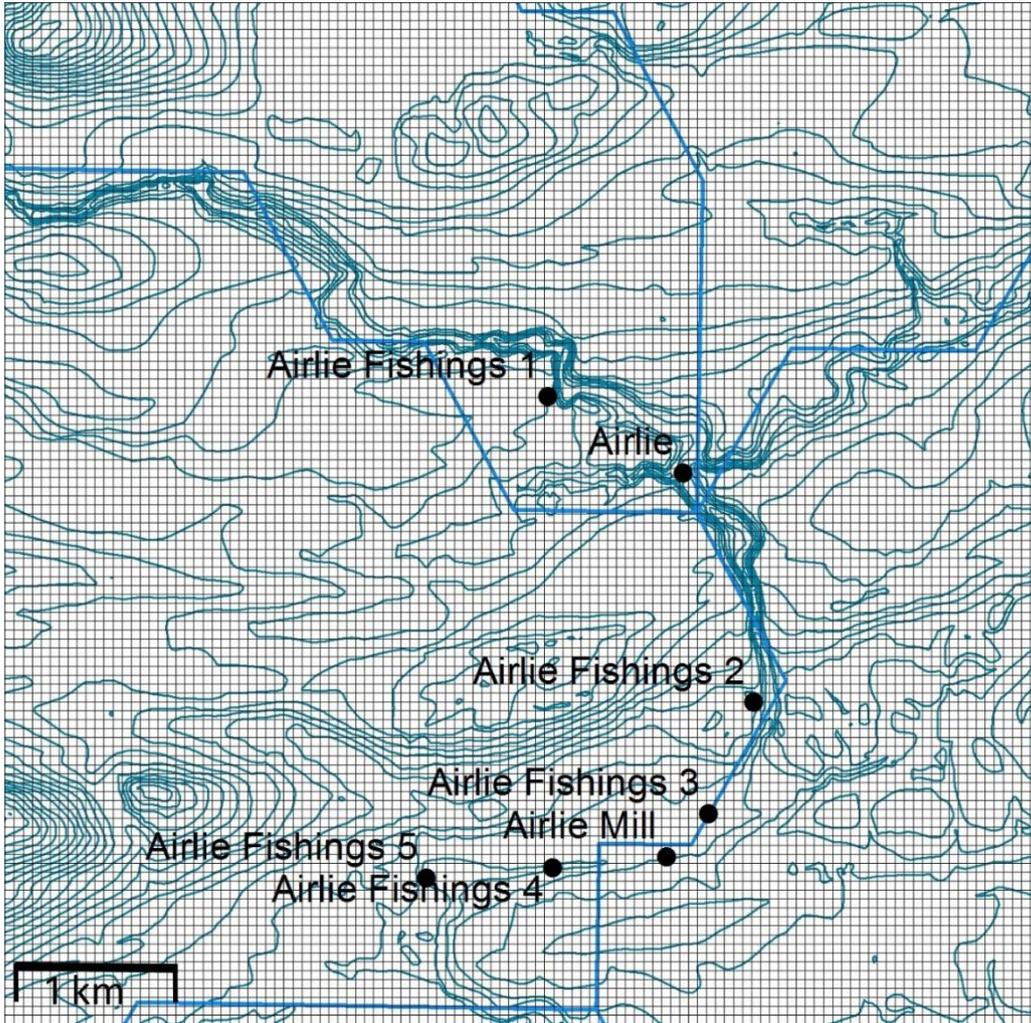


Table B.5.1: RA and RRA Values of Airlie Castle

	Airlie Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Airlie Castle	0	18	27	39	47	54	43
Fishing 1	18	0	42	50	53	56	54
Fishing 2	27	42	0	15	30	42	21
Fishing 3	39	50	15	0	20	33	33
Fishing 4	47	53	30	20	0	14	13
Fishing 5	54	56	42	33	14	0	27
Mill	43	54	21	8	13	27	0
Total Depth Value	228	273	177	165	177	226	191
Mean Depth (total/k-1)	38	45.5	29.5	27.5	29.5	37.66667	31.83333
RA [2(MD-1)/k-2]k=274	0.272058824	0.327206	0.209559	0.194853	0.209559	0.269608	0.226716
RRA (RA/Dk) D=.041	0.947940152	1.14009	0.73017	0.67893	0.73017	0.9394	0.78995
Total RA's	1.709558824						
Mean RA	0.244222689						
Total RRA's	5.956650953						
Mean RRA's	0.850950136						

The above listed RA figures are overall very low, suggesting that none of the features are strongly separated. There is only a 0.132353 difference between the feature with the highest integration (Fishing 3) and that which is most segregated (Fishing 1). The mean RA value is 0.244222689. The nodes which are closest to the average level of integration for this site are the Mill and Fishing 5. Airlie Castle itself is not far from this average, suggesting that it was situated to control and disseminate interaction with the rest of the site.



Map B.5.1: Airlie Castle Surroundings [Copyright Kate Buchanan]

B.5.2.b: Bonnyton

The site of Bonnyton Castle currently contains no structural remains. It has been traditionally accepted that the structure was ruinous in 1785 and according to the New Statistical Account by 1833 only a trace of the foundations and moat were present.²⁸ There is evidence that this property was granted from royal care to the nobility from 1376 when it belonged to Walter Tullach.²⁹ Tullach also had the forest of Montreathmont and fishings at Usan, on the coast of Angus, though the connection to the Wood of Bonnyton on the verso of the charter might be coincidental.³⁰ The property remained in the possession of the Tullochs until the late fifteenth century, when it passed to the Wood family through female inheritance. Although the majority of the land was Wood property it was a divided inheritance where part of the land and the mill rights were passed on to the Gardyne family.³¹ The following family tree demonstrates the inheritance, where segments outlined in green demonstrate the main properties' inheritance, and purple the portion belonging to Jonet. John Wood originally inherited the property, but died without heir, when it was passed to his brother, William Wood. The Wood family retained the property through the seventeenth century, but after the structure was no longer used it became part of the Carnegie Earl of Southesk's estates.

²⁸ Society for the Benefit of the Sons and Daughters of the Clergy, *The new statistical account of Scotland, Vol. 11* (Edinburgh, 1833), pp. 116-117.

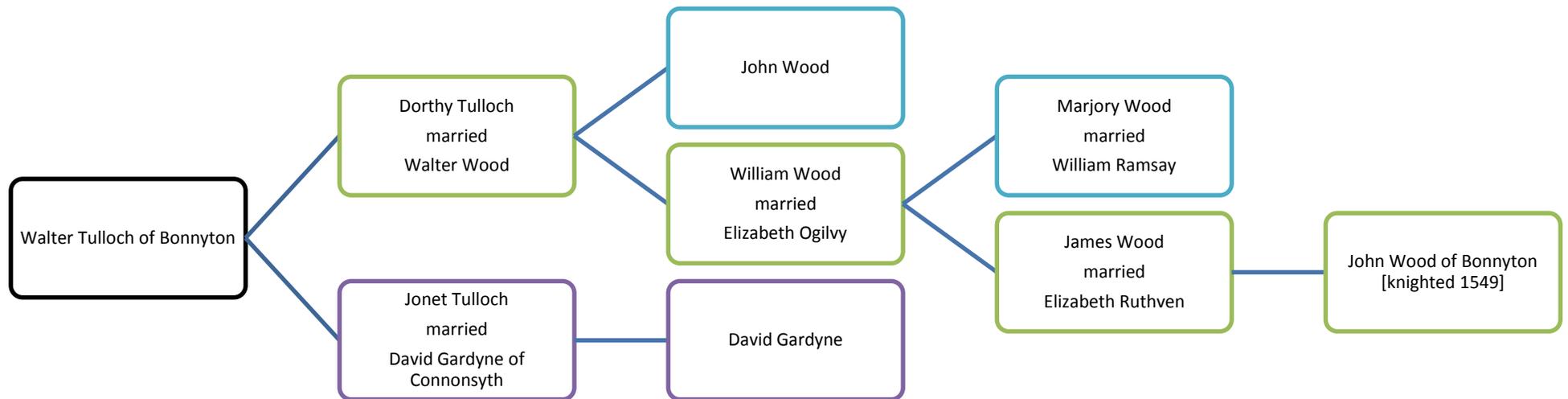
²⁹ *RMS*, i, no. 570.

³⁰ National Library of Scotland, Papers of the Earl of Airlie, GD16/24/104, Charter under John, son of William Tulloch, 1399.

³¹ Warden, *Angus or Forfarshire*, vol IV, pp. 306-307.

The structure in ruins at the end of the eighteenth century has been traditionally dated to 1666 when Bonnyton was erected into a barony by King Charles II; however, there is ample evidence for its importance and use long before then and it was already described as a ‘castle, tower, and fortalice’ in 1542. The property was described in this document as having both a grain and a fulling mill, a woodland (silvis), a park, and fresh and salt water fishings.³²

³² *RMS*, iii, no. 623.



The evidence of the location of these features has mostly disappeared along with the castle; however, there is a note of the mill of Bonnyton on the 1745-1828 Ainslie Map shown in figure B.5.5. Here the mill is shown near Bonnyton at the end of a small stream, showing a mill lade diverting from the stream south of the mill and re-joining it north-east of the mill. The location of this mill has been predicted based on where it is located in relation to the topographic incline indicated on this map. The water source can be seen running through Bonnyton Den,³³ but has been dammed towards the head, turned into a culvert, and field-drained.³⁴ Using the position of the mill and the mention that Bonnyton had rights to both fresh and salt water fishing, the sites of the fishings were estimated and random points were selected within the probable fishing area. Most of the sites are in the South Esk, as this seems to be the most likely place for the fishings. Although there is a suggestion of fishings further east on the coast in Usan, the mouth of the South Esk in the tidal Montrose Basin suggests both fresh and salt water fishing. The size of the water source on which the mill is located is unclear, and though most of the fishings would have been in the Montrose Basin or at the mouth of the river, the fishing rights may have extended as far as the mill.



Figure B.5.5: Bonnyton Castle: 1745-1828 Ainslie [Copyright NLS]

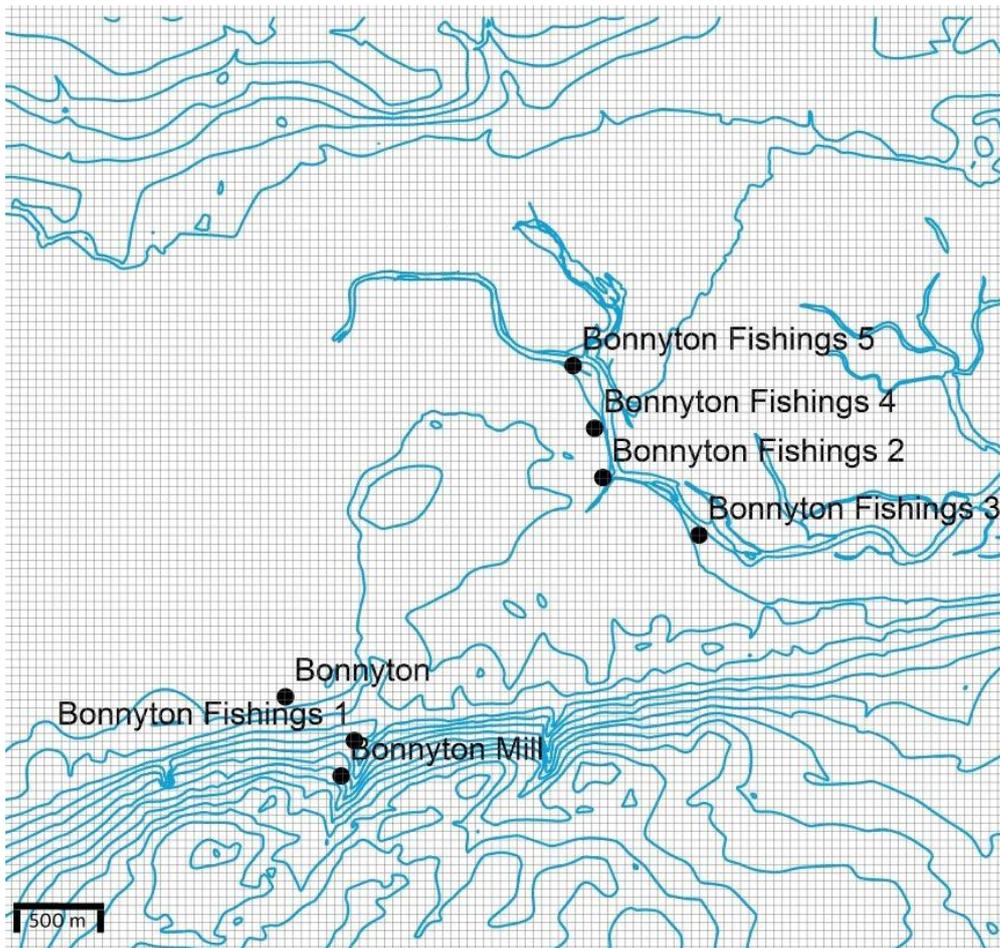
³³ OS. 1927, Forfarshire, Sheet XXXIV. SE.

³⁴ OS. 1903, Forfarshire, Sheet XXXIV. NE.

Table B.5.2: RA and RRA Values of Bonnyton Castle

	Bonnyton Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Bonnyton Castle	0	10	47	54	50	54	13
Fishing 1	10	0	44	48	48	53	6
Fishing 2	47	44	0	14	7	15	49
Fishing 3	54	49	14	0	19	26	53
Fishing 4	50	48	7	19	0	9	53
Fishing 5	54	53	15	26	9	0	58
Mill	13	6	49	53	53	58	0
Total Depth Value	228	210	176	214	186	215	232
Mean Depth (total/k-1)	38	35	29.33333	35.66667	31	35.83333	38.66667
RA [2(MD-1)/k-2]k=233	0.32034632	0.294372	0.24531	0.300144	0.25974	0.301587	0.326118
RRA (RA/Dk) D=0.046	0.994864349	0.9142	0.761833	0.932125	0.806647	0.936607	1.01279
Total RA's	2.047619048						
Mean RA	0.292517007						
Total RRA's	6.359065365						
Mean RRA's	0.908437909						

The RA values for Bonnyton Castle present very little deviation, and are mostly clustered around a 0.3 figure. There is a 0.080808 deviation between the most segregated feature in the system (the Mill) and the most integrated (Fishing 2). The mean RA is 0.292517007, making Fishing 1 and Fishing 3 the closest to the average level of integration within the site. Bonnyton Castle itself is the second-most segregated feature within this system, suggesting that there is some slight impediment in how the rest of the site is accessed from the castle structure. Equally, there is some obstruction of access to and from the Mill within this particular site system.



Map B.5.2: Bonnyton Castle and Surroundings [Copyright Kate Buchanan]

B.5.2.c: Broughty

Broughty Castle is situated on a promontory – formerly a rocky islet – in the tidal estuary of the River Tay. The surviving structure of Broughty Castle does not resemble the original form, which is thought to have begun around 1490, due to major reconstruction initiated after it was purchased by the government in 1855.³⁵ The structure was left to

³⁵ F. Mudie, D. M. Walker and I. MacIvor, *Broughty Castle*, p. 66.

deteriorate after 1603 and was fairly ruined when the reconstruction by the War Council took place. MacGibbon and Ross describe the structure prior to its reconstruction as ‘a large oblong’ keep surrounded by a wall with the remains of three round towers on it.³⁶ An 1853 photo graph suggests that this description is correct and that the current tower retains most of the original fifteenth century tower.³⁷ Excavation in 1993 revealed the remains of a two-metre thick wall running north-east to south-west, which has been identified as the possible location of the sixteenth century tower.³⁸ It is likely that prior to the late fifteenth century construction of Broughty there was some form of fortification at the site. In 1488 when Andrew, 3rd Lord Gray was given the hereditary sheriffship of Angus, he was granted the properties of Broughty along with permission to build a fortalice there.³⁹ Broughty remained in the possession of the Grays until the mid-sixteenth century when it was garrisoned by the English during the ‘Rough Wooing’.⁴⁰ Andrew, 3rd Lord Gray was succeeded as lord of Broughty by his son with his first wife, Patrick 4th Lord Gray However, Patrick died without a male heir and the position of Lord Gray and Broughty passed to his half-brother’s decedents: Patrick, 5th Lord Gray, and then his second son by his second wife Elizabeth Atholl, Patrick Gray of Buttergask, 6th Lord Gray. Possession of the Broughty property is indicated by the green squares in the tree below.

³⁶ MacGibbon and Ross, *Castellated Architecture of Scotland*, vol. IV, p. 386.

³⁷ F. Mudie, D. M. Walker and I. MacIvor, *Broughty Castle*, p. 60.

³⁸ F.M.C. Baker, ‘Broughty Castle, (Dundee Parish): Late 15th-century Castle’, *Discovery Excav Scot*, (1993) pp. 97-98.

³⁹ *RMS*,ii, no. 1959.

⁴⁰ A conflict between English and Scottish territorial interests involving the contestation Mary Queen of Scots’ betrothal to the prince of England. See M. Merriman, *The Rough Wooings: Mary Queen of Scots, 1542 – 1551* (East Linton, 2000).

Pont draws a four-storey battlemented tower surrounded by a wall. In the documents, Broughty is mentioned as having both fishings and a mill, and later as having two towers and a fish-house.⁴¹ It is unlikely that the mill was directly on the Tay, but the only mill indicated on Pont 26 is the Mill of Balmossie further north along the Dighty Water (see Figure B.5.6).⁴² Ainslie shows many mills along this water, which suggests that a place along the Dighty was the most likely location for a mill in the area (see Figure B.5.7).⁴³ Later documents state that the mill associated with Broughty was the Balgillo Mill upstream from Balmossie.⁴⁴ The fishing rights, however, are likely to refer to the area within close proximity of the structure on either side of the promontory on which it sits in the River Tay, as they are described as around Broughty Crag in 1490.⁴⁵ Thus five random points along the water near Broughty Castle have been chosen for estimating the distance between the structure and the fishings.

⁴¹ *RMS*, vi, no. 1190.

⁴² National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

⁴³ National Library of Scotland, EMS.s.356, Ainslie.

⁴⁴ Register of the Parliament of Scotland, 1641/8/409.

⁴⁵ National Library of Scotland, Papers of the Steuart Fotheringham Family of Powrie, Fotheringham, Murthly, and Strathbraan (Murthly Castle Muniments), GD121/1/111/27A, Titles of the Broughty Fishings, 1490, 1568.



Figure B.5.6: Pont 26's Depiction of Broughty Castle [Copyright NLS]⁴⁶



Figure B.5.7: Ainslie's Depiction of Balgillo Mill [Copyright NLS]

⁴⁶ Image covers approximately 35km².

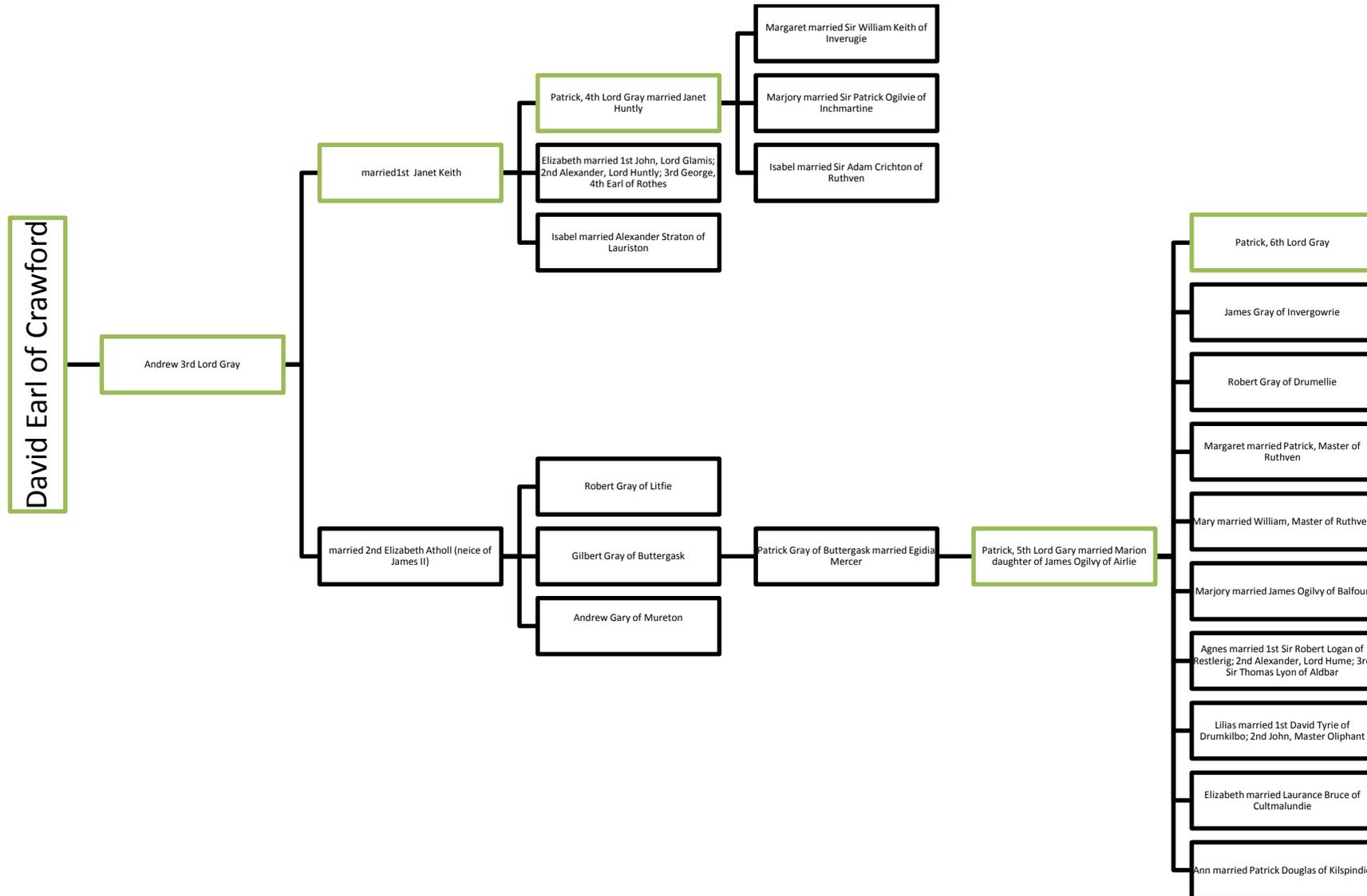
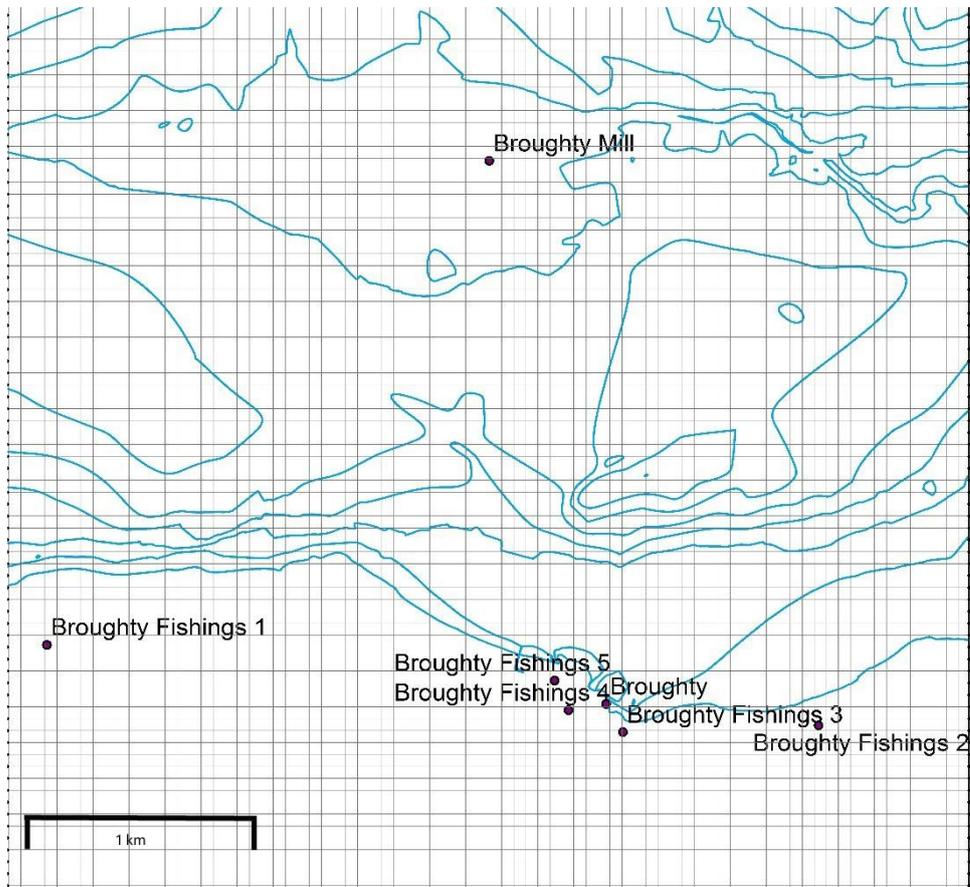


Table B.5.3: RA and RRA Values for Broughty Castle

	Broughty Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Broughty Castle	0	47	18	3	4	5	47
Fishing 1	47	0	42	54	57	57	56
Fishing 2	18	42	0	17	21	23	55
Fishing 3	3	54	17	0	6	8	50
Fishing 4	4	57	21	6	0	3	53
Fishing 5	5	57	23	8	3	0	44
Mill	47	56	55	50	47	44	0
Total Depth Value	124	313	176	138	138	140	305
Mean Depth (total/k-1)	20.66666667	52.16667	29.333333	23	23	23.333333	50.833333
RA [2(MD-1)/k-2]k=269	0.147315855	0.383271	0.212235	0.164794	0.164794	0.167291	0.373283
RRA (RA/Dk) D=.041	0.513295663	1.335439	0.739494	0.574195	0.574195	0.582895	1.300639
Total RA's	1.61298377						
Mean RA	0.230426253						
Total RRA's	5.62015251						
Mean RRA's	0.80287893						

At Broughty, the RA values remain low, but there is a deviation between the most segregated (Fishing 1) and the most integrated (Broughty Castle) of 0.147315855. Although all the RA values are low, this value implies a distinct separation between nodes that are very easily accessible and those that are not. There is a mean RA value of 0.230426253, which means that the nodes closest to the average level of integration are Fishing 2 and Fishing 5. The fact that Broughty Castle itself is the most integrated feature within this system suggests that this site is very accessible. The mill is the second-most segregated feature in this system, suggesting there is a slight impediment to accessing the mill from the rest of the system.



Map B.5.3: Broughty Castle and Surroundings [Copyright Kate Buchanan]

B.5.2.d: Dun

The remains of Dun Castle have long ceased to exist, though the RCAHMS identify its location as approximately 300-metres west of the site of the House of Dun. The House of Dun was built in the eighteenth century and became the central feature of the Dun estate even as the older castle crumbled away. Jervise suggests that the gateway arch which remained in 1861 was part of an early sixteenth-century structure, but it was constructed

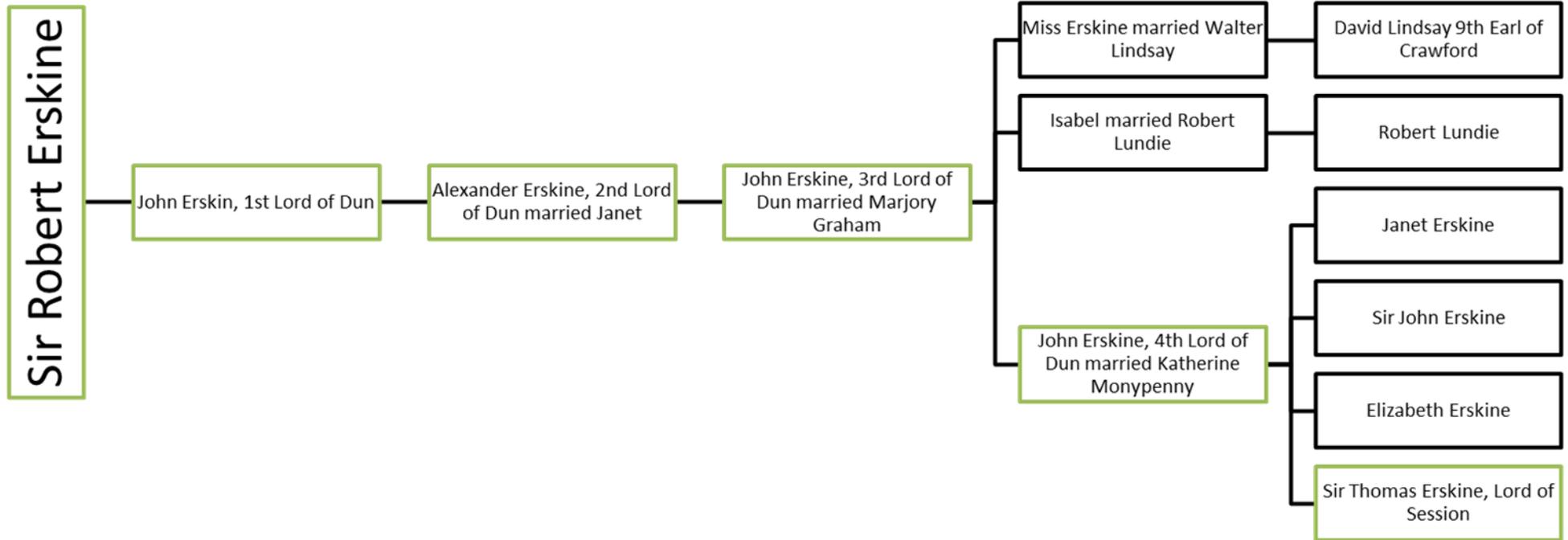
in the seventeenth century.⁴⁷ The site of the old parish church chapel is also noted by the RCAHMS, where the mausoleum retains part of the pre-reformation building material.

The property came into the possession of the Erskine family under the fourteenth century chamberlain Sir Robert Erskine. His son, John Erskine, became the first Lord of Dun. The property continued in the Erskine family, seeing the rise of the prominent figure of the Scottish Reformation, John Erskine, 4th Lord of Dun. In 1534 the barony was described as having rights to a castle, fortalice, mill, fishings and advowsons of the churches and chaplainries when the King gave the lands to John Erskine, 4th Lord of Dun.⁴⁸ In 1542 when the King confirmed this grant it was described as a mansion.⁴⁹

⁴⁷ A. Jervise, *Memorials of Angus*, p. 18.

⁴⁸ *RMS*, iii, no. 1452.

⁴⁹ *RMS*, iii, no. 2640.



There is no Pont reference to the site of Dun due to its location being in the eastern part of the map which was trimmed, so there is no sixteenth century depiction of the structure described as a castle and fortalice. Edward denotes the location of the castle, but with little description other than a few trees surrounding the property (see Figure B.5.8).⁵⁰ Roy no longer mentions the castle structure, but does label the Mill of Dun downstream on the water of Dun (see Figure B.5.9).⁵¹ Ainslie and Thomson both indicate the location of the old church which is identified by the RCAHMS as next to the site of the old castle and the mill downstream.⁵² Based on the likely continuity of the mill site, the mill has been located as next to this identified structure for this study. The fishings have also been placed along this stretch of water, though it is possible that some of the fishing rights extended further into the mouth of the River South Esk.



Figure B.5.8: Edward's Depiction of Dun Castle [Copyright NLS]

⁵⁰ National Library of Scotland, EMS.s.35, Edward, 1678.

⁵¹ British Library, Maps K.Top.48.25-1.a-f, Roy, 1747-55.

⁵² See Appendix A, pp. 381.

Table B.5.4: RA and RRA Values of Dun Castle

	Dun Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Dun Castle	0	40	35	31	30	31	11
Fishing 1	40	0	6	10	14	21	25
Fishing 2	35	6	0	5	11	18	30
Fishing 3	31	10	5	0	7	7	20
Fishing 4	30	14	11	7	0	8	18
Fishing 5	31	21	18	14	8	0	19
Mill	11	25	30	20	18	19	0
Total Depth Value	178	116	105	87	88	104	123
Mean Depth (total/k-1)	29.66666667	19.333333	17.5	14.5	14.66667	17.333333	20.5
RA $[2(MD-1)/k-2]k=212$	0.273015873	0.174603	0.157143	0.128571	0.130159	0.155556	0.185714
RRA (RA/Dk) D=0.049	0.795964644	0.509047	0.458142	0.374844	0.379472	0.453515	0.541441
Total RA's	1.204761905						
Mean RA	0.172108844						
Total RRA's	3.512425378						
Mean RRA's	0.501775054						

The RA values for Dun Castle remain low, with a deviation between the highest segregated (Dun Castle) and the most integrated (Fishing 3) 0.128571. Although this is a significant difference, there is a fairly even spread of values between these numbers, which makes the site weighted to neither the highly integrated nor the highly segregated side. The mean RA value is 0.172108844. This value means the mill and Fishing 1 represent the closest to average level of integration for this system, easily accessible from all areas within the system. Dun Castle itself is the most segregated feature in this site. Although this number is still a low RA value, it provides some indication that the castle site is slightly more removed from the rest of the system.

B.5.2.e: Fithie

Fithie Castle is another castle that, though prominent from the fourteenth to sixteenth centuries, has been abandoned since possibly the seventeenth century leaving no structural remains. Warden's description of the site suggests that all that remained of the structure was the back wall of a cottage in the area.⁵³ Further inspection of the cottage revealed that, although it contained stones from an older medieval structure, it was simply built from re-used material rather than incorporating part the original structure itself.⁵⁴

Unfortunately Fithie is not drawn on the surviving Pont maps. It was likely drawn on a section of the map that was trimmed off by Gordon due to deterioration. Edward and Moll both note the location of Fithie and Edward additionally marks Little Fithie, which is also noted on Roy's map; absent from the latter is any indication of the castle. Ainslie and Thomson however, clearly note Fithie Castle separately among the structures of the estate.

Antiquarian tradition had it that this property was held by a Duncan of Fithie from the Bishop of Brechin from the thirteenth century, though this is not found in any of the accounts of Brechin. The property was then divided into Eastern and Western portions. Warden suggests that it is at this point that Fithie was acquired by Leslie of Rothes; however, a charter of 1401-02 demonstrates possession of Little Fithie by George Leslie,

⁵³ (Alexander Johnson Warden was a nineteenth century antiquarian who wrote a five volume text on Angus.) Warden, *Angus or Forfarshire*, p. 247.

⁵⁴ RCAHMS, 1978.

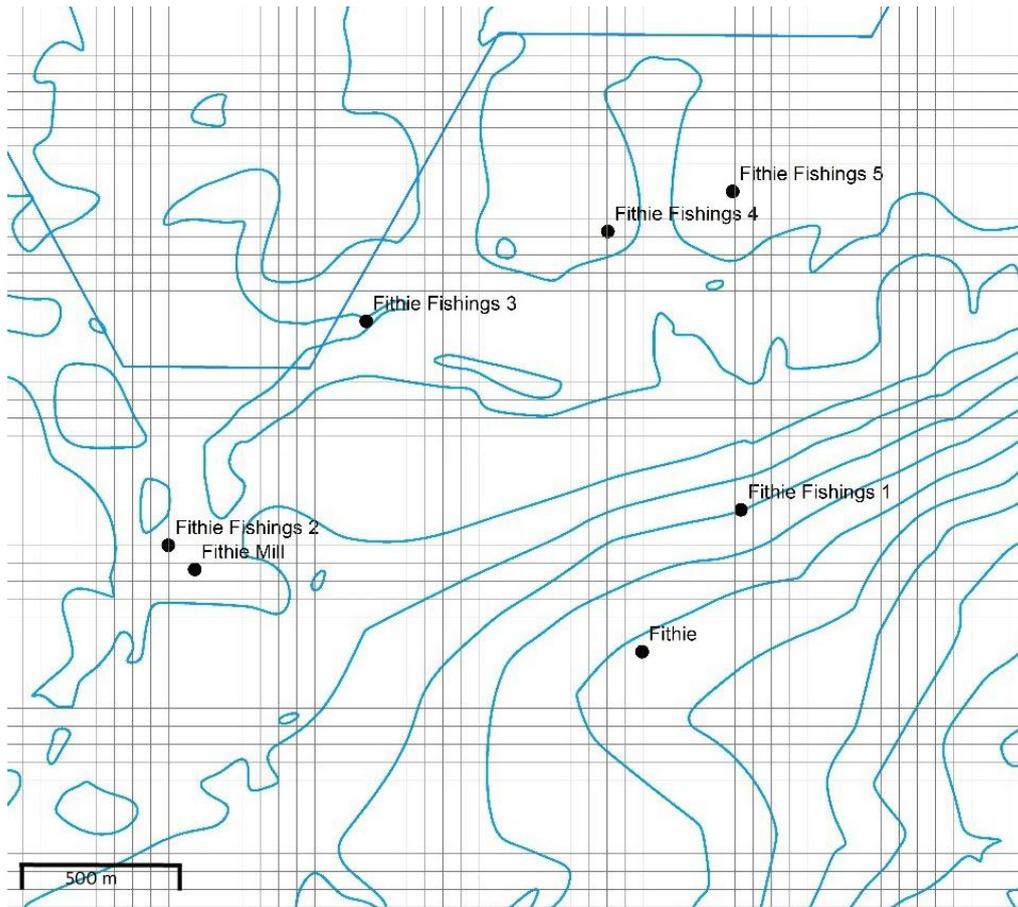
Lord of Rothes, indicating a Leslie interest in the property much earlier on.⁵⁵ There is some link to the Montreathmont estate, which might have been through the Abernethy properties, which were jointly inherited by the Douglas Earls of Angus and the Leslies of Rothes.⁵⁶ A more detailed description of the Fithie property held by the Earl of Rothes is provided by a grant from the King to George, Earl of Rothes in 1539 which details the property as having a manor, fortalice, mill, and fishings.⁵⁷ A charter in 1542 of the king confirms the inheritance of the Fithie property by Norman Leslie, son and heir of George Leslie, Earl of Rothes.⁵⁸ Fithie was by no means the main property held by the Earls of Rothes, but was a minor property, with Ballinbreich in Fife being the main seat of the estate.

⁵⁵ Warden, *Angus or Forfarshire*, p. 247.

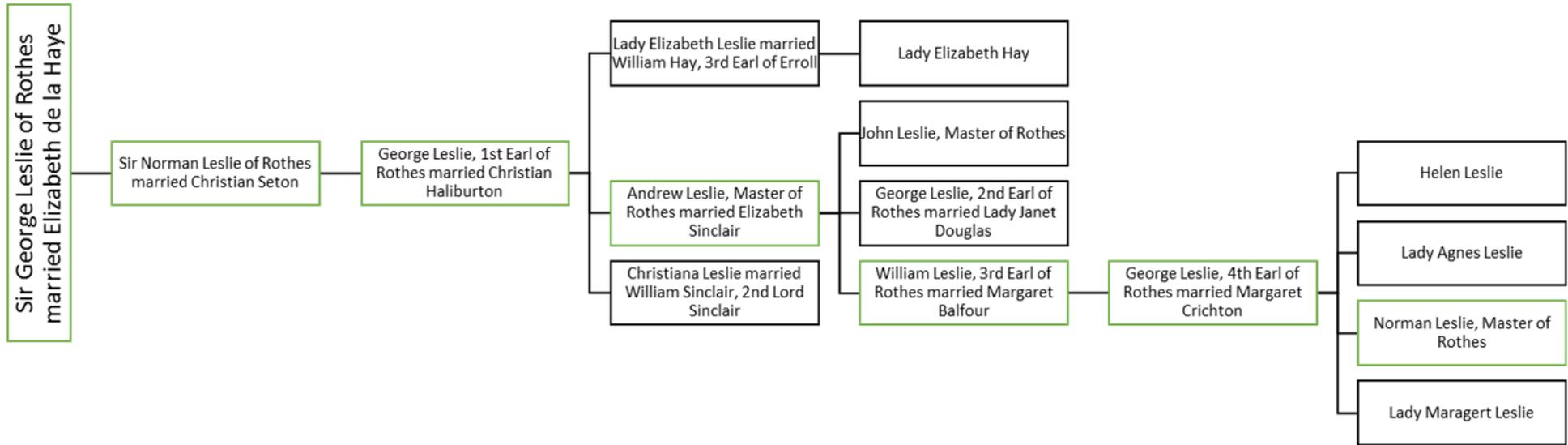
⁵⁶ National Archive of Scotland, Papers of the Earl of Airlie, GD16/24/76, Notorial Instrument, 1425.

⁵⁷ *RMS*, iii, no. 1988;no. 2094.

⁵⁸ *RMS*, iii, no. 2809.



Map B.5.4: Fithie Castle and Surroundings [Copyright Kate Buchanan]



There is no early map or archaeological evidence for the location of the mill at Fithie. However, the maps demonstrate mills around Fithie, Powmill, Farnell Mill, and Muir Mill, being on the Powmill. A mill at Fithie is noted on the O.S. map near Little Fithie, which is where it has been identified for this project.

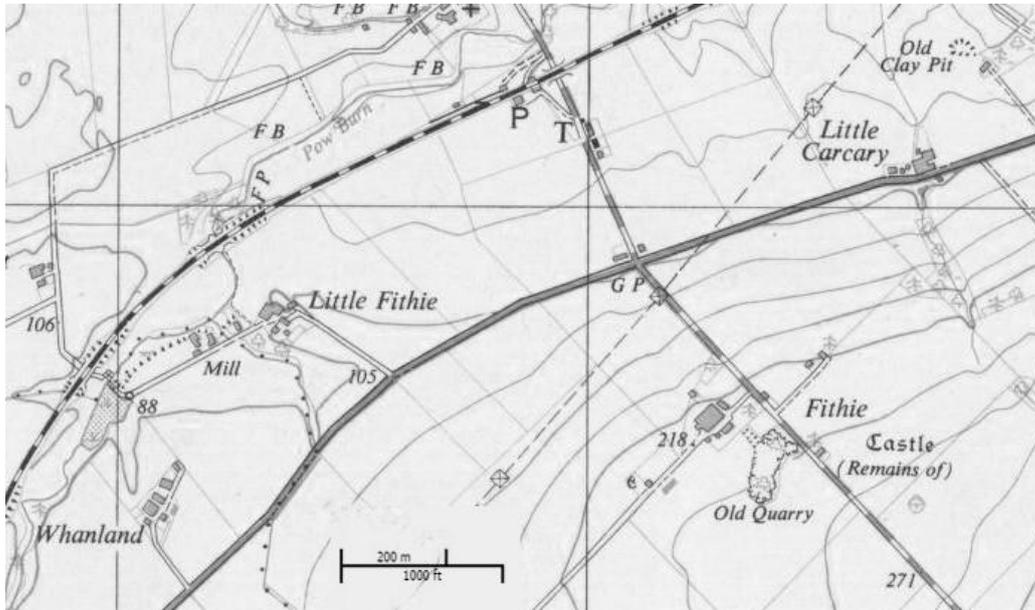


Figure B.5.10: O.S. 1957 Depiction of Fithie Mill [Copyright NLS]

TableB.5.5: RA and RRA Values for Fithie Castle

	Fithie Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Fithie Castle	0	10	27	34	24	26	25
Fishing 1	10	0	32	23	18	18	31
Fishing 2	27	32	0	17	30	37	2
Fishing 3	24	23	17	0	15	22	17
Fishing 4	24	18	30	15	0	8	30
Fishing 5	26	18	37	22	8	0	37
Mill	25	31	2	17	30	37	0
Total Depth Value	136	132	145	128	125	148	142
Mean Depth (total/k-1)	22.66666667	22	24.16667	21.33333	20.83333	24.66667	23.66667
RA [2(MD-1)/k-2]k=177	0.247619048	0.24	0.264762	0.232381	0.226667	0.270476	0.259048
RRA (RA/Dk) D=0.056	0.631681244	0.612245	0.675413	0.592809	0.578231	0.68999	0.660836
Total RA's	1.740952381						
Mean RA	0.248707483						
Total RRA's	4.441205053						
Mean RRA's	0.634457865						

Fithie Castle's RA values remain low, with a deviation from the most segregated feature (Fishing 5) and the most integrated feature (Fishing 4) 0.043809. The RA values are all fairly close together, suggesting the features in the site are fairly equidistant from each other. The mean RA value is 0.248707483 which makes the features closest to the average integration for this site, and thus the most easily accessed from all other points, Fithie Castle and Fishing 1. Fithie Castle's close ranking to the mean suggests that the castle is highly accessible from all the other points and vice versa. Equally, the mill is third from the most segregated site, suggesting easy access between it and the rest of the system.

B.5.2.f: Melgund

MacGibbon and Ross describe the remains of Melgund Castle as an ‘imitation of the castles of an earlier period,’ particularly the fifteenth century. It is centred on a four-storey keep with additional hall and drawing room built on the east side of the keep with a unique complex.⁵⁹ Pont 26 confirms a four storey crenelated tower flanked on either side by what looks like two corner towers, both two storey and crenelated. Part of Melgund was restored as habitable space in the 1990s. Excavations prior to this development revealed that the complex was substantially larger than the ruins indicated.⁶⁰ The structure was originally built with red sandstone and rubble bonded with a pink clay.⁶¹

The current structure of Melgund is said to have been built by Cardinal David Beaton, Archbishop of St. Andrews and Chancellor of Scotland for his mistress, Marion Ogilvy, in 1543.⁶² Jervise states that the lands were inherited by David Beaton, the eldest son of Cardinal Beaton and Marion Ogilvy, and later by James Ogilvy.⁶³ The lands of Melgund, however, had been in the hands of the Anands since the fourteenth century.⁶⁴ The lands were sold through the heiress Janet Anand to Cardinal Beaton, but the confirmation of

⁵⁹ MacGibbon and Ross, *Castellated Architecture of Scotland*, vol. IV, pp. 311-12.

⁶⁰ J. Lewis, 'Melgund Castle (Aberlemno parish)', *Discovery Excav Scot* (1994), p. 80.

⁶¹ N. Tranter, *Fortified House in Scotland*, Vol 4 (Edinburgh, 1962), p. 139.

⁶² MacGibbon and Ross, *Castellated Architecture of Scotland*, vol. IV, p. 311.

⁶³ Jervise, *Memorials of Angus*, p.53.

⁶⁴ *Ibid.*, p. 63.

this sale lists a manor, mill, and fishings already on the property before it was in the possession of Cardinal Beaton.⁶⁵ This wording suggests that there may have been an earlier structure which Cardinal Beaton built over or imitated in his design for the present structure. The mill was present from at least 1526, where it is listed with many other accompanying features such as a brew house.⁶⁶

The mill of Melgund is not shown on Pont 26; however, the property of Melgund is shown on the very edge of the map and has been trimmed at this point (see Figure B.5.11). It is very likely that Pont could have annotated it, although it is now missing from the map. Thomson, Roy, and Ainslie all show the location of Melgund mill being north of the castle along the Melgund burn and so it is likely that there was a longstanding continuity of the location of this mill (see Figure B.5.12).⁶⁷ Likewise, the fishings are not specified in the documents, but it is likely that they were on the nearby River South Esk, with some rights perhaps extending up the Melgund Burn. Both Thomson and Ainslie note that the castle was a ruin by the time they produced their maps.

⁶⁵ *RMS*, iii, no. 2788.

⁶⁶ *RMS*, iii, no. 897.

⁶⁷ National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

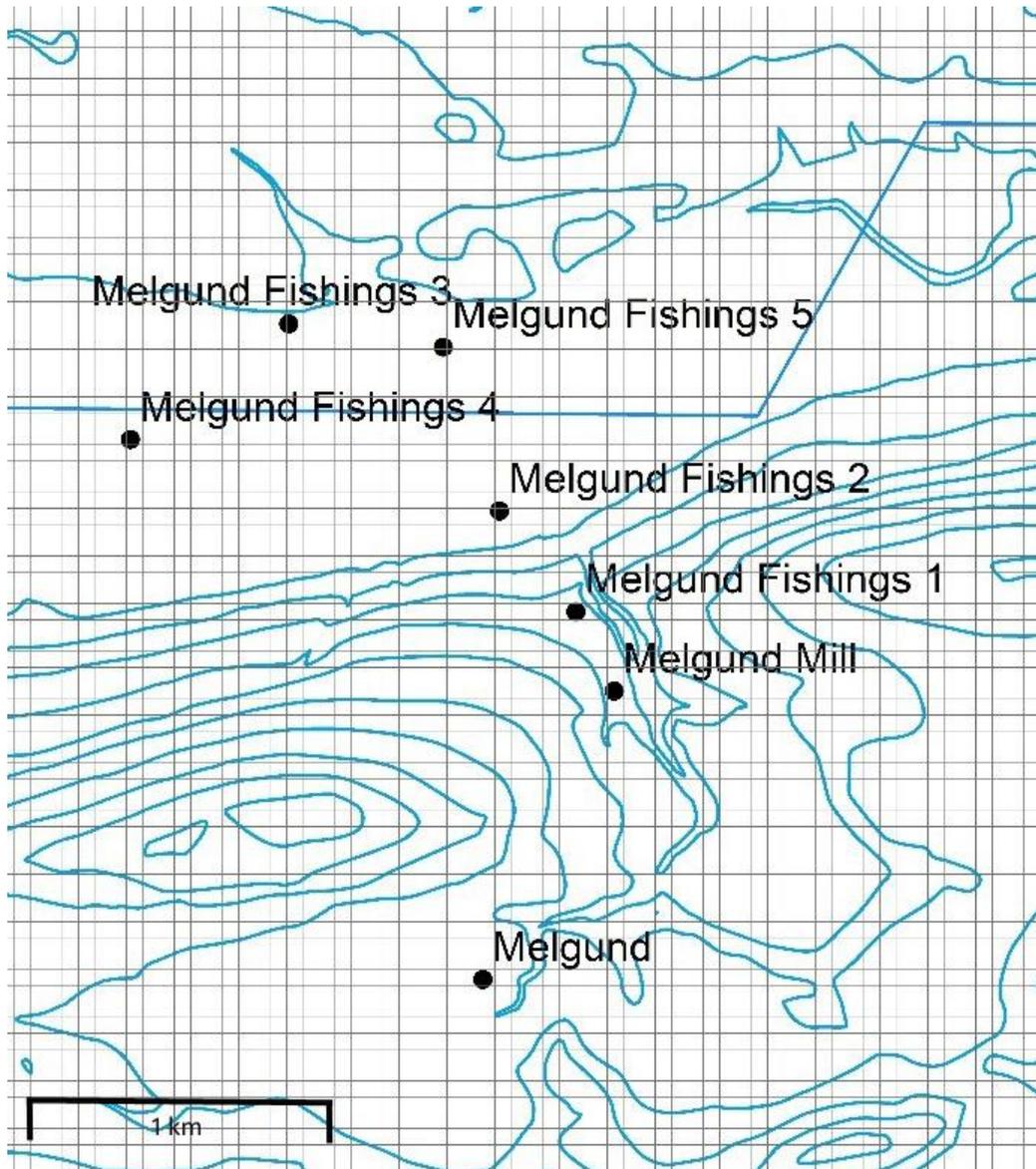


Figure B.5.11: Pont 26 's Depiction of Melgund [Copyright NLS]⁶⁸



Figure B.5.12: Ainslie's Depiction of Melgund Mill [Copyright NLS]

⁶⁸ Image covers approximately 5km².



Map B.5.6: Melgund Castle and Surroundings [Copyright Kate Buchanan]

Table B.5.6: RA and RRA Values for Melgund Castle

	Melgund Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Melgund Castle	0	25	30	43	41	40	21
Fishing 1	25	0	8	26	30	19	6
Fishing 2	30	8	0	18	24	25	13
Fishing 3	43	26	18	0	13	9	31
Fishing 4	41	30	24	13	0	21	33
Fishing 5	40	19	25	10	21	0	35
Mill	21	6	13	31	35	25	0
Total Depth Value	200	114	118	141	164	139	139
Mean Depth (total/k-1)	33.33333333	19	19.66667	23.5	27.33333	23.16667	23.16667
RA [2(MD-1)/k-2]k=214	0.305031447	0.169811	0.176101	0.212264	0.248428	0.209119	0.209119
RRA (RA/Dk) D=0.049	0.889304509	0.495077	0.513413	0.618846	0.724279	0.609678	0.609678
Total RA's	1.529874214						
Mean RA	0.218553459						
Total RRA's	4.460274676						
Mean RRA's	0.637182097						

Melgund's RA values remain on the lower spectrum, but the difference between the most segregated feature (Melgund Castle) and the most integrated (Fishing 1) is 0.176100698. This difference is significant, but there is a fairly even spread of figures between these two numbers suggesting that the site is evenly weighted between segregated and integrated. The mean RA value is 0.218553459, which makes the mill, fishing 5 and fishing 3 the closest to the average level of integration within the system, and therefore

the most controlling. Fishing 1 is the most integrated site, suggesting an ease of access from this point within the rest of the site. Melgund Castle is the most segregated site within this system, suggesting that access to and from this feature is obstructed or controlled.

B.5.2.g: Panmure

It is suggested that the original structure of Panmure Castle was built in the late twelfth century by the de Valognes, Lords of Panmure and destroyed in 1336. A new phase of construction might have occurred in the middle of the fifteenth century. Sir Robert Maule added to this in the early sixteenth century with a hall and tower on the northern side.⁶⁹ In 1958 it appeared that the ruins revealed the outline of several buildings built around a courtyard.⁷⁰ Millar notes that the structure was contained within a 34.14m by 36.27m enclosure.⁷¹ The site is surrounded by steep slopes and rises above the Monikie Burn.

The Panmure property has been a longstanding property of the Maule family. In the middle of the fifteenth century the property was given to Sir Thomas Maule. The estate was passed on to his son, Sir Thomas Maule of Panmure and would have passed on to his son by Lady Elizabeth Lindsay, daughter of the 1st Earl of Crawford, Alexander, but he died before his father. After commissioning some additions to the estate Sir Thomas of

⁶⁹ Warden, *Angus or Forfarshire*, vol. 2, p. 392.

⁷⁰ Ordnance Survey, 1958.

⁷¹ A. H. Millar, *The Historical Castles and Mansions of Scotland: Perthshire and Forfarshire*, Paisley (Edinburgh, 1890), p. 278.

Panmure granted the property to Alexander's son, Thomas, in the 1490s. Sir Robert Maule of Panmure succeeded Sir Thomas of Panmure, who was succeeded by his son, Thomas. A grant of the properties of Panmure was confirmed by the King in 1540-41 to Thomas Maule, son of Robert Maule, which included a description of Panmure with details of it containing a fortalice, castle, mill, and fishings.⁷²

Pont 26 shows two towers connected over an entrance, both three- or four-storeys high. Attached to the east of this structure is another single-storey building. Pont 26 also shows a mill structure, rather than his typical encircled 'x' symbol, labelled 'Mil of Panmure' slightly upstream along the Monikie Burn. This is probably the demesne mill, though the Crombie and Carmylie mills are also very close (see Figure B.5.13).⁷³ Edward and Moll depict two distinct enclosed developments; the small one is marked for the Old Castle and the larger for the new house. Neither of these maps denotes a location of a mill. Ainslie gives little attention to the old castle among the greatly developed ground of Panmure House, but does note two mills upstream on the Monikie Burn which is likely a similar location of the mill noted by Pont.⁷⁴ The boundaries of the fishings are also unknown, but the geography of the Monikie Burn suggests that some of the fishings rights would have been held around Panbride and Easthaven at the mouth of the Monikie Burn. Therefore, five sites along the Monikie Burn have been chosen to represent fishings for Panmure.

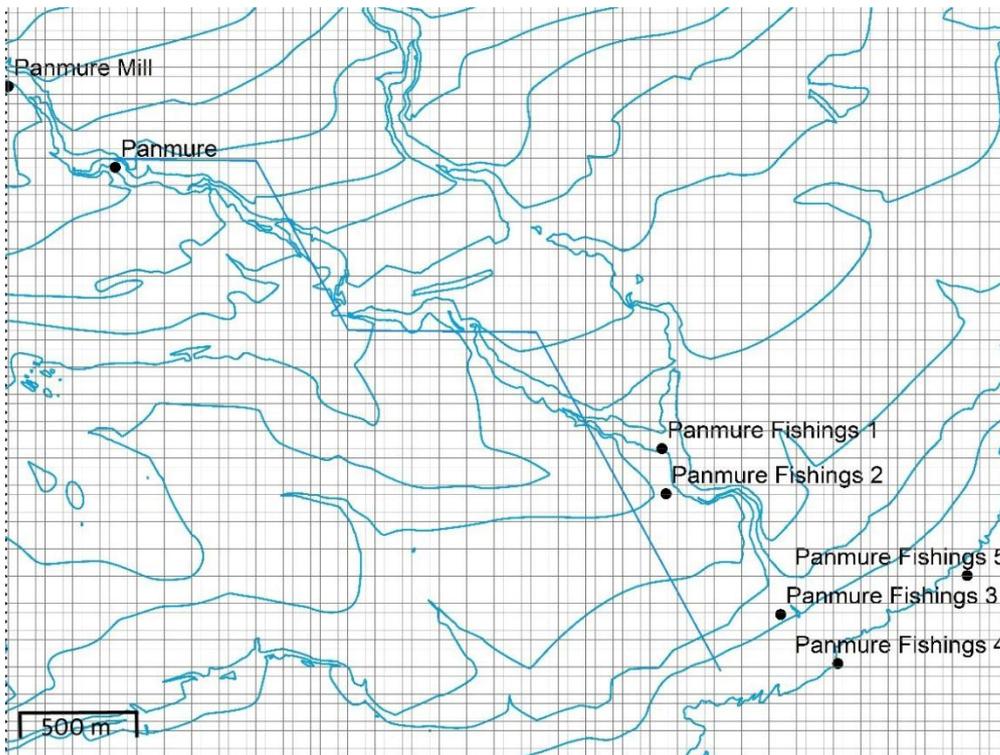
⁷² *RMS*, iii, no. 2315.

⁷³ National Library of Scotland, Adv.MS.70.2.9, Pont 26, c.1583-96.

⁷⁴ See Appendix A, p. 449.



Figure B.5.13: Pont 26's Depiction of Panmure [Copyright NLS 1]⁷⁵



Map B.5.7: Panmure Castle and Surroundings [Copyright Kate Buchanan]

⁷⁵ Image covers approximately 18km².

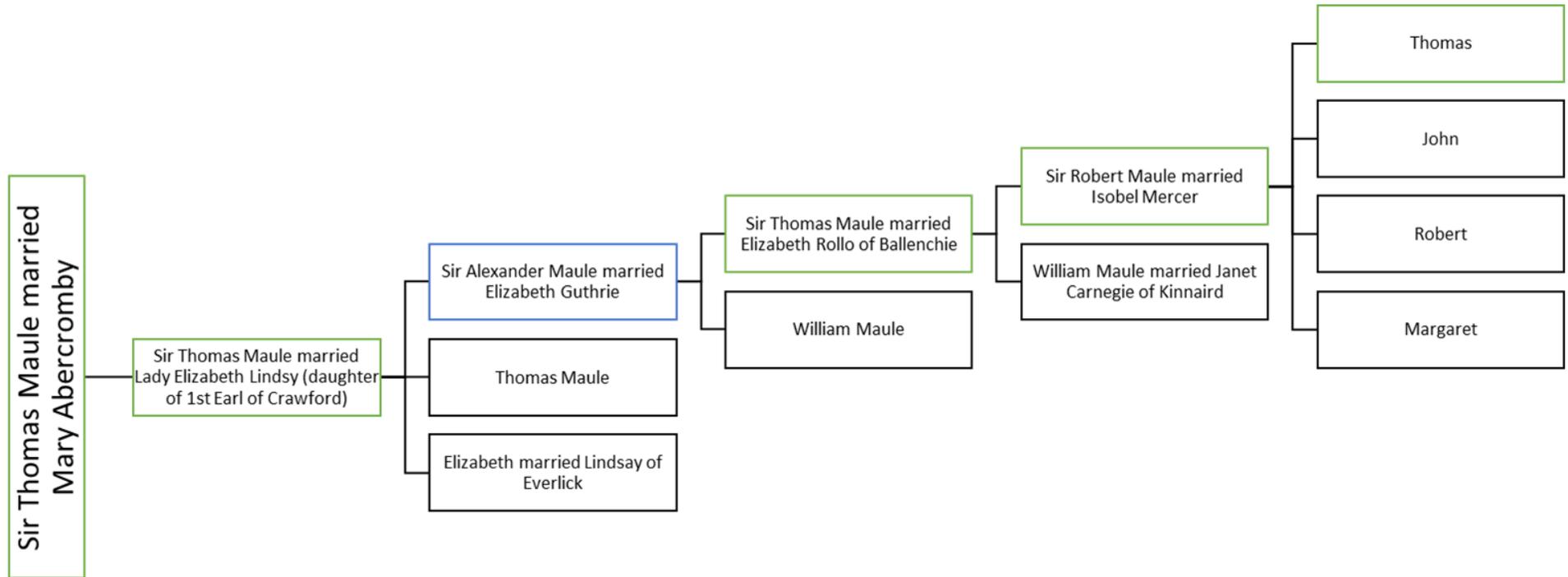


Table B.5.7: RA and RRA Values for Panmure Castle

	Panmure Castle	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mill
Panmure Castle	0	68	71	87	96	104	15
Fishing 1	68	0	5	23	31	37	15
Fishing 2	71	5	0	18	27	35	86
Fishing 3	87	23	18	0	8	21	103
Fishing 4	96	31	27	8	0	17	111
Fishing 5	104	37	35	21	17	0	119
Mill	15	15	86	103	111	119	0
Total Depth Value	441	179	242	260	290	333	449
Mean Depth (total/k-1)	73.5	29.83333	40.33333	43.33333	48.33333	55.5	74.83333
RA [2(MD-1)/k-2]k=196	0.74742268	0.297251	0.405498	0.436426	0.487973	0.561856	0.761168
RRA (RA/Dk) D=0.052	2.053359012	0.816623	1.114006	1.198973	1.340584	1.54356	2.091122
Total RA's	3.697594502						
Mean RA	0.528227786						
Total RRA's	10.15822665						
Mean RRA's	1.451175236						

The RA values for Panmure are fairly low with a deviation from the highest segregated space (Fishing 1) and the most integrated space (Panmure Castle) 0.182130316. This difference is a significant variance, and as there are more low numbers than high the site is slightly weighted to a more integrated system. The mean RA value for Panmure is 0.206185567 meaning the Mill and Fishing 2 are closest to the average level of integration within this system, and the most controlling point of the system. Panmure Castle itself is the most integrated feature of the system, suggesting that access between the castle and the rest of the system is not hindered, easing interaction between these features.

B.5.3: Discussion

Several interesting features that are not immediately obvious from looking at a visual site representation emerge after assessing these site systems through RA values. First, the features within the system that are the most openly accessed and most integrated can be identified. This recognition is particularly important when the feature within this system that is most integrated is the noble residence, which occurs at Broughty. Broughty is the most readily accessed and least controlled within this system. Second, the RA values demonstrate which features within the system are the most segregated and therefore the most controlled within the system set up. The sites where the noble residence is the most controlled site within the system are Melgund and Dun. Access to and from the noble residences at Melgund and Dun is therefore comparatively difficult compared to the rest of the features within the system. Bonnyton Castle, the third most segregated noble residence, is the second most segregated within its own system by a small margin, also suggesting that access to and from this noble residence was comparatively difficult and controlled. The mill appears as the most controlled site at Bonnyton, implying that more emphasis was put into controlling access to and from this feature. Third, the mean RA value provides the point of general integration and control within the system. The RA values within the site that fall nearest the mean exercise the most control on interaction between the rest of the sites listed as follows: Airlie – Mill and Fishing 5; Bonnyton – Fishing 1 and Fishing 3; Broughty – Fishing 2 and Fishing 5; Dun – Mill and Fishing 1; Fithie – Fishing 3 and Mill; Melgund – Mill, Fishing 5, and Fishing 3; and Panmure – Mill and Fishings 3 and 5. The presence of the mills as the one of the closest features to the mean RA in five sites might indicate a trend for the mill site to be the most important site for controlling interaction within the rest of the system. This presence would be in

line with the importance which the mill had as a major point of social and economic interaction within the property of the noble residence.

Table B.5.8: Mean RRA Values

Site	Mean RRA Value
Dun	0.501775054
Fithie	0.634457865
Melgund	0.637182097
Broughty	0.80287893
Airlie	0.850950136
Bonnyton	0.908437909
Panmure	1.451175236

As stated before, the RRA values adjust the representation of the site to compensate for discrepancy between sites with differing numbers of spaces within their system. Because this essentially adds another ratio to the equation this expands the ratio demonstrated by the RRA value to beyond the value of 1. Table B.5.8: Mean RRA Values lists the mean RRA values in ascending order. Compared to the RA values in Tables B.5.1-7, the values represented here are much higher, with a difference between the lowest (Dun) and the highest (Panmure) of 0.949400182. This variance indicates that, although within their own system there are lower levels of segregation, they are each quite segregated systems on a larger scale. Considering that these site systems include features within the broader context of the surrounding landscape, this segregation is hardly surprising.

The RA values indicate the site of the noble residence at Broughty was the least segregated node within its respective systems. Dun appears as the lowest rating of

segregation on the above table, with Broughty a middle ground. Compared to the rest of the sites, Dun is the most suitable for easy interaction; however, it still remains a mid-range rating of access as a site suggesting a moderate level of obstruction and control within the site. Panmure, on the other hand, appears high on the list of mean RRA values, indicating that although the site of the noble residence might be moderately suited for access, the site as a whole is fairly difficult to access. Bonnyton, which had both the mill and the castle as highly segregated features within the system, retains an overall highly segregated rating. This segregation implies that there are several elements that hinder access or control the interaction between different areas of the site.

Table B.5.9: RRA Values for the Mills

Site	RRA value for Mills
Dun	0.54144
Melgund	0.60967
Fithie	0.66083
Airlie	0.78995
Bonnyton	1.01279
Broughty	1.30063
Panmure	2.09112

The above table demonstrates the RRA values for the mills within each site for this study listed in ascending order. The difference between the lowest (Dun) and the highest (Panmure) is 1.54968. The sites remain weighted to either a lower (or more appropriately mid-range) or a high rating. For Dun, Melgund, Fithie, and Airlie there seem to be moderate amounts of limitation of access, indicating that they are neither difficult nor easy to access from the rest of the site system. The mill sites at Bonnyton, Broughty, and Panmure, on the other hand, are rated with highly segregated sites within a system. For

these particular sites it appears that a certain level of confinement and controlled access from the rest of the site was required. There is a certain element of natural geography that explains this environment, as the closest likely waters suitable for powering a mill at Broughty are naturally occurring some distance from the noble residence. At Bonnyton and Panmure, however, the mills are not particularly far away from the noble residence, but are a significant distance from the fishings, slightly obstructing the location from the site as a whole.

Table B.5.10: RRA Values for the Noble Residences

Site	RRA value for Noble Residence
Broughty	0.513295663
Fithie	0.631681244
Dun	0.795964644
Melgund	0.889304509
Airlie	0.947940152
Bonnyton	0.994864349
Panmure	2.053359012

The RRA values for the noble residences show a very distinct difference between the least segregated (Broughty) and the most segregated (Panmure) at 1.540063349. All the sites have mid-range or high-level segregation values. Fithie and Broughty all have a moderate RRA rating suggesting that interaction between the castle and the rest of the site is neither good nor bad, and Dun is only slightly more difficult to access. Airlie, Melgund, and Bonnyton all merit a high RRA rating, indicating a high tendency to control access to and from the noble residence. Panmure's rating is significantly higher than any of the others, indicating an even stronger level of control and difficult access. This rating seems to present a (perhaps expected) tendency to control the interaction with the noble

residence in relation to the rest of its property, and that few site systems allow potentially easy access within the system.

Table B.5.11: Mean RRA Values for the Fishings

Site	Fishing 1	Fishing 2	Fishing 3	Fishing 4	Fishing 5	Mean Fishing RRA
Dun	0.509047	0.458142	0.374843	0.379471	0.453514	0.4350034
Melgund	0.495076	0.513412	0.618845	0.724278	0.609677	0.5922576
Fithie	0.495076	0.513412	0.618845	0.724278	0.609677	0.5922576
Broughty	1.335438	0.739493	0.574195	0.574195	0.582895	0.7612432
Airlie	1.14009	0.73017	0.67893	0.73017	0.9394	0.843752
Bonnyton	0.9142	0.761833	0.932125	0.806647	0.936607	0.8702824
Panmure	0.816623	1.114006	1.198972	1.340583	1.543559	1.2027486

As the locations of the fishings have been randomly allocated through the estimated property it only makes sense to evaluate them as a whole unit for the RRA value assessment. Thus, the mean RRA value for all of the fishings has been calculated in the above table where they have been listed in ascending order based on the mean RRA values in the last column. All the figures appear to be mid- to moderate- high RRA ratings with a difference of 0.7677452 between the lowest (Dun) and the highest (Panmure). This rating indicates that the fishings at Dun, Melgun, and Fithie were a moderately comfortable point of interaction and access to the rest of the site system.

It is important to remember that the RRA values are rating the features and sites on a scale that allows for comparison between them and any other conceivable site system.

Therefore, they are given a value that rates the site according to its total possible interaction, subsequently allowing other sites within the study to be compared to each other, highlighting the stronger significance of evaluating these sites within a meso-scale context. The significance of comparing one site to any other possible site is limited, requiring a parameter to be set for these numbers to have any bearing which for this study has been set to the meso-scale of all seven of the properties addressed in this chapter.

This broader scale demonstrates that the site systems in question all fall within a moderate to high level segregation rating. Again, considering the purpose of this study was to address features within the surrounding landscape of the castles, which cover very extensive districts, this was an expected result. Panmure's outstandingly high RRA value for the interaction of the noble residence with the site is a significant deviation from the other values, though this unusual value is likely due to the estate size being expanded by the distance for the fishings. Bonnyton's features remain close to the highest, resulting in it being the most consistently segregated site in this study, whereas the others tend to incorporate more integrated to less integrated nodes within their systems.

The above findings are of course specific to the limiting parameters set out with this case study and would no doubt change with the addition of other information, which provides a greater impetus to further investigate these sites to find more physical evidence of the landscape features and see if these observations hold. On the micro-scale each site interacts differently within its own system of features, but there are several possible trends that need to be addressed on a broader or meso-scale before further conclusions can be made. Now that each site has been looked at through assessing how each feature

within its system interacts within the system itself, it is important to compare these sites with the other sites in this study. To do this comparison, the RRA values have also been figured for each feature within the sites and each site as a whole. In this way it is possible to see how the integration of each feature compares to the other sites as well as the site as a whole. From this assessment the most physically restricting site (Panmure) and most freely accessible site (Dun), with a rating of those in between, have been determined within the parameters of this assessment.

B.5.4: Conclusion

Determining the RA values and RRA values for these seven sites within Angus demonstrates that although each site system is clearly designed differently, there are certain trends in the data set worth mentioning. First, within the RA values analysis it is rare to have the noble residence as either the most integrated feature or the most segregated, though it is more common for them to be more segregated. Each system has its own distinct distribution of controlled and un-controlled space. Second, the spaces that seem to have the most controlling factor on the rest of the system are often the mills. This tendency is potentially linked to the mills being the centre for interaction due to grain grinding requirements for the tenant population of the property. Third, from a broader perspective each of these sites has a fairly high segregation rating. Finally, most sites have a mix of features with a moderate to high rating of segregation, allowing each feature's relationship to the rest of the site to be distinguished. Some of the sites, like Bonnyton, retain a consistent level of segregation.

The high RRA values for the sites of this study are due to the vast distance covered by some of the properties. This distance opens up the door for other features to impede access between these points, though they have not been included in this study due to the lack of evidence of their presence. Nevertheless, this assessment has explored the possibilities of addressing the external space of a noble residence's base systematic integration and segregation and has provided a basic understanding of how these systems work. This study has identified valuable relationships between the individual sites and how they might be compared to each other. Within the parameters of this study, there is no indication that any particular feature rests either extremely segregated or integrated. As all of the features needed to be accessed at some point, this level of integration is not surprising; however, it does identify that the main features of production, mills and fishings, were not specifically excluded from the immediate surroundings of the noble landscape and on many occasions contains these features in the immediate vicinity. It is, however, very clear that the RA and RRA values applied to the external space of a noble residence would be better applied to a dataset where a greater understanding of the landscape and its features is present. Further research is needed to identify if this model continues to provide relevant information within the context of a residence with more indefinable landscape features.

Chapter 6: Gravity Model Assessment

The assessment of the types of features associated with noble properties is based on what Clark classified as a semi-micro scale.¹ This classification has been extremely useful when discussing further intricacies within systems of interaction, as interactive relationships are much more complicated than micro-, meso-, and macro-scale suggest. Bringing 'semi' into the classification system allows for the study of interaction that breaches these categories, shown by Torrence and Knappett.² The parameters of the analysis in this chapter are confined by the semi-micro scale while addressing two types of interaction: object to object (the structure to the landscape feature), and agent to object (the people based in the structure to the landscape features). The purpose of this chapter is to further develop an understanding of the agent-to-object interaction taking place within these noble structures and their surrounding landscapes. As one of the main purposes for this thesis is exploration of methods to further understand the interactive relationships between the noble residences and their surrounding landscape features, the gravity model is designed to study one of the causes of interaction: spatial proximity and product/population type. In order to use the gravity model, this relationship must be reflexive, so the measured amount of the landscape features is based on a prediction of resource production. Although the purpose of this project is not to address the possible economic output of properties being studied, it does involve the interaction between places of production and consumption, which is one of the elements addressed by the *gravity model*.

¹ D. L. Clarke, *Spatial Archaeology* (London, 1977), p. 65.

² R. Torrence, 'Hunter-Gatherer Technology: Macro- and Microscale Approaches', in R.H. Layton, C. Panter-Brick, and P. Rowley-Conwy (eds.), *Hunter-gatherers: An Interdisciplinary Perspective* (Cambridge, 2001), p. 89; C. Knappett, *An Archaeology of Interaction: Network Perspectives on Material Culture and Society* (Oxford, 2011).

Looking at production levels of similar property types has been used to determine a probable output quantity to the production feature. The gravity model's focus has been used to help identify the draw for the people in the noble residence to move to resource-centred sites. This calculation is based on the number of people present at the noble residence and the propagation of the resource, which is discussed in detail below. The potential amount of movement within a site is important for many reasons. Not only is it a necessary relationship for basic survival through food production, but the customs developed around hospitality and entertainment were designed in a way that increased or decreased the physical interaction between the main structure and the other resources. Where these resources were in relation to the structure and the scale of the hosting responsibilities of the lord determined what features were focal points within the site; they therefore determined what was most affected by an increase or decrease in population.

This chapter has three main goals. First, it will discuss the maximum possible residences for a feast based on the size of the hall and known feasting traditions of the time using Eadie's model. This method has limited the number of residences that qualify for this assessment to those which retain enough physical presence to identify the measurements of the hall, as discussed on Chapter Three. Affleck, Broughty, Edzell, Glamis, Inverquhar, and Redcastle have been chosen based on this criterion. Second, this study identifies an estimated estate production based on the records of similar properties in Dunkeld and St. Andrews. As the locations of the mills have been the most consistently identifiable, this exploration of the gravity model has solely focused on grain production. Third, this study uses the populations of the noble residences and estimated grain production to identify the draw for

interaction between the two locations. Identifying the draw for interaction between the noble residence and the mill categorises the likely flow of traffic between these two points, and subsequently the level of connectivity that the noble residence has with its main symbolic feature of grain resource. This connectivity reflects how easily this interaction could have potentially taken place, or the effectiveness of interacting between these points, with distance being the primary factor rather than what might have existed as topographical obstruction.

One reason the mills were chosen was because of the ability to identify a location of the site through geographical and some modern archaeological evidence. However, mills were especially important to medieval society and particularly as a point for interaction. Baronial laws required that all of the grain grown within the baronial estate was to be ground at the lord's mill. In some cases, a lord might have had more than one mill to service a wider estate, but it was most common for the baronial mill to be part of the demesne lands. Therefore, if one was a tenant of the baronial estate, regardless of how close another mill might have been, one was required to travel to the baronial mill to have their grain ground, no matter the distance, of which a portion was kept by the miller and the lord. It is this legal requirement to grind grain at the baronial mill that makes the mill an exceedingly important site when it comes to identifying points of interaction within a noble landscape.³

The mill site was a point to which all tenants of the barony were at least seasonally drawn, and therefore a site which connected many locations of the noble landscape.⁴ The connective nature of this arrangement makes the mill a very likely location for

³ M. Sanderson, *Scottish Rural Society in the Sixteenth Century* (Edinburgh, 1982), p. 17.

⁴ J. Langdon, *Mills in the Medieval Economy: England 1300-1540* (Oxford, 2004), p. 9.

the dissemination of information or dispensation of justice. With this understanding in mind, the mill sites were already a major centre of interaction with a heavy draw on the entire estate. The connection to the site had an intangible component which was the law, and a very physical element in the grain. The intangible component is key to understanding the mill as a point of interaction with the rest of the landscape and essential to understand when considering the results of the gravity model, as it is a draw for interaction that is present and can qualify some of the results of the gravity model.

As much as the mill is an important point for interaction with the wider extent of the noble's estate, it is also an extremely significant locale for interaction with the noble residence. In relation to dealing with the tenants from the estate, it is from the noble residence to the mill that the lord (or his chamberlain) must move in order to enforce baronial laws and rights. In this case, there was a physical draw of people from the noble residence to the mill. Similarly, the grain brought to the mill from the estate and collected as tax for the lord needed to be transported from the mill to the residence for consumption, which would have required people. Therefore, there is a very clear physical interaction between the noble residence and the mill which further extends the connective influence to the rest of the estate. However, as the location of the mill and the noble residence and their potential quantities of people and goods are the only aspects that at this point can be identified, it is this relationship that the gravity model addresses. Although this study explores how the noble residence spatially relates to the rest of the estate, it is at this point focused on features within an immediate proximity of the noble residence, providing information

which will allow future studies to focus on this relationship within the broader context of the entire lordly estate.

As the draw of the mill has an immaterial component as a result of the legal requirements for grinding grain, the noble residence also possesses an intangible draw for interaction, which must be considered when interpreting the results of this gravity model assessment. The personal pull of the lord's presence informed how the noble residence acted as a central node for interaction.⁵ For example, a feast held at the noble residence had the potential to draw a large number of people to the site, ranging from other nobles from lordships any distance away, to the local population called in as hired help to assist with the entertainments. In this way, the noble residence functions as a central point of interaction across a wider network than just the immediate surroundings of jurisdiction. However, the fact that the noble residence existed as a point of interaction for individuals and groups from such a broad context means that how it interacted with its immediate surroundings was affected by the increase or decrease of population present at the noble residence. It is important to remember that the surrounding landscape could be adversely affected by increased interactions caused by an increase of population; however, this chapter is focused on exploring how the positions of the mills related to the noble residence, and how strong this connection was.

⁵ C. M. Woolgar, *The Great Household in Late Medieval England* (London, 1999), p. 30; P. Brears, *Cooking and Dining in Medieval England* (Totnes, 2012), p. 469.

B.6.1: The Method of the Gravity Model

Interaction between places has been assessed by scholars of economics, geography, archaeology and anthropology, resulting in methods such as functionalism, conflict theory, and symbolic interactionism. One of the more common methods, developed by both geographers and economists, is the gravity model, which was chosen for this project due to the ability to focus on both people and resources. This method directly addresses the bond between two places created through social interaction, assuming a neutral approach to production and consumption. The gravity model is a modification of Newton's law of gravity, which stipulates that gravitational force is directly proportional to the combined mass of the objects and inversely proportional to the distance between them, typically expressed as:

$$Fg = G \frac{M_1 M_2}{d^2}$$

where G is the gravitational constant, M_1 is the mass of object 1, M_2 is the mass of object 2, and d is the distance between the two objects. The basis of this formula has been amended⁶ to assess the interaction between two population sizes and can be written as:

$$I = \frac{P_1 P_2}{d^2}$$

where I is the quantification of interaction, P_1 is the population of the first site, and P_2 the population of the second site, and d remains the distance between them. The resulting figure represents the maximum number of possible one-to-one relationships between the two populations being addressed considering the distance and 'assumes a maximal interaction situation in which each member of one population interacts

⁶ As the gravity model addresses human behaviour the external force of the gravitational constant is removed.

with all members of another.’⁷ Calculations based on this basic form have revealed interesting, though basic, ideas of the interaction between populations but assessment becomes more complex as the variables of interaction, population, and distance are defined, taking into account any barriers or complications that might factor into their values. In order to apply the gravity model within a more real world situation, many other adjustments and added variables have been made according to specific projects.

To allow the gravity model to address complex situations, many scholars have developed control variables to ensure that they account for complications such as ‘demographic, geographic, ethnic/linguistic, and economic conditions.’⁸ Some of these studies include variables that address legal restrictions to trade and interaction, such as Martínez-Zarzoso and Nowak-Lehmann’s study on the effects of Mercosur-European Union trade.⁹ Melitz incorporated adjustments for climate conditions that affect trade along great distances north and south.¹⁰ Adjustments that incorporated the effect of geographic terrain on ease of movement between sites proved valuable in Wilson’s work on prehistoric interaction.¹¹ Due to its diverse application within a spatial context, the gravity model has been incorporated into recent uses of spatial and network analysis. In their 2012 article, Evans, Rivers, and Knapett developed a gravity model method suitable for their research that incorporated ‘both the local

⁷ G. A. Johnson, ‘Aspects of Regional Analysis in Archaeology’, *Annual Review of Anthropology*, 6, (1977), p. 482.

⁸ J. J. Lewer and H. Van den Berg, ‘A Gravity Model of Immigration’, *Economics Letter*, 99 (2008), p. 164.

⁹ I. Martínez-Zarzoso and F. D. Nowak-Lehmann, ‘Economic and Geographical Distance: Explaining MERCOSUR Sectoral Exports to the EU’, *Open Economies Review*, 15 (2004), pp. 291-314.

¹⁰ J. Melitz, ‘North, South and Distance in the Gravity Model’, *European Economic Review*, 51 (2007), pp. 971-991.

¹¹ L. Wilson, ‘Understanding Prehistoric Lithic Raw Material Selection: Application of a Gravity Model’, *Journal of Archaeological Method and Theory*, 14 (2007), pp. 388-411.

geographical topology between two sites but also the wider regional structure in which these sites reside.¹² For this method they have used what is called a *doubly contained Gravity Model*. Not only does this model provide an index to rank locations that interact with each other, but it can demonstrate the area of influence which certain factors have on this interaction, as shown by Eichengreen and Irwin's use of the Gravity Model to predict the extent to which markets influence the trade routes.¹³

The many adjustments listed above have greatly increased the versatility of the Gravity Model in its application. However, they have not come without criticism. Not every form of interaction is appropriate for the variations on the gravity model, as the study by Wong reveals,¹⁴ and the theoretical basis for the formula has been challenged.¹⁵ However, as long as the appropriate variables have been put in place and the interaction includes a reflexive factor, the gravity model can help evaluate the relationship between various populations, whatever the type. In this study, the main link between these features is based on resources. The reflexive nature lies in the characteristic that these resources need a certain amount of interaction in order to exist. A mill will produce no grain unless both a miller works the mill and people bring grain to it to be milled. The resource itself would not be drawn anywhere if there were not a population demanding, gathering, and transporting it; in other

¹² R. Rivers, C. Knappett, and T. Evans, 'Modelling Maritime Interaction in the Aegean Bronze Age', *Antiquity*, 82 (2008), p. 8.

¹³ B. Eichengreen and D. A. Irwin, 'The Role of History in Bilateral Trade Flows' in J.A. Frankel (ed.), *The Regionalization of the World Economy* (Chicago, 1998), p. 44.

¹⁴ W. Wong 'Comparing the Fit of the Gravity Model for Different Cross-Border Flows', *Economics Letters* (2008), p. 477.

¹⁵ C. Jensen-Butler, 'Gravity Models as Planning Tools: A review of Theoretical and Operational Problems', *Geografiska Annaler. Series B. Human Geography* (1972), p. 68.

words, it does not operate independent of human agency. In order to make the interpretation applicable, the data needs to be standardised into a ratio of interaction. In this study, this ratio has been expressed through calculating the *relative interaction*, which is further discussed below.

The main focus of this chapter is to combine a human population and a non-human product population to assess an agent-object relationship. As stated above, the interaction between the people and product populations can be defined as reflexive, as increased human population interaction could mean a greater level of production at the resource site, although it is understood that this is not always the case. Though half based on economic production, the purpose is not to predict an economic output based on this interaction, but to identify the consistent draw for the parties of both sites to interact with each other. Therefore, the most important amendments for this project revolve around Jochim's use of the gravity model to address a relationship to resource sites and place these within a scaled index. Jochim takes the amended direct substitution for the gravity model as listed above and suggests the following adjustments:

The interaction with a resource is proportional to the dietary importance of that resource, and so:

$$I = kp,$$

where p is the dietary proportion of a resource and k is a constant. One of the interaction masses is the human population at a settlement, and this remains constant in the formulations for different resources. Thus:

$$M_1 = K (\text{constant}).$$

The mass of a resource cluster equals the weight of an individual product times the number of individuals per cluster, or:

$$M_2 = wna.$$

The gravity model may then be reformulated:

$$kp = \frac{Kwna}{d^2},$$

where w is the weight of an individual product, n is the number of individuals, a is the area, and d the distance between the two places.¹⁶ This works well within the context of assessing the interaction between a noble residence and the landscape surrounding it, as the ‘settlements’ referred to by Jochim can be replaced by the number of inhabitants of the noble residence and the landscape features identified can become the sources of resources.¹⁷

In order to use this formula to assess these noble residences, two aspects of the sites need to be defined:¹⁸ the population of the noble residences, and the quantity of product being gained from the resource sites. Exact numbers of the households for the structures in question are not known, as no household accounts survive. Eadie, however, has developed a system that measures the maximum number of diners it would be possible to entertain at one time in a hall based on its size. Eadie’s system was used for this assessment to determine the possible size of the household.¹⁹ This method limits the number of sites that were included within this assessment to those

¹⁶ K. W. Butzer, *Archaeology as Human Ecology: Method and Theory for a Contextual Approach* (Cambridge, 1982), p. 215.

¹⁷ M. A. Jochim, *Hunter-gatherer Subsistence and Settlement : A Predictive Model* (New York, 1976), pp. 56-58.

¹⁸ This section uses the same distances as used to calculate the RA values in Section B.1.

¹⁹ G. Eadie, ‘Functions and Classification of the Tower House in Ireland’, Queen’s University, Belfast (2008) [unpublished PhD thesis].

where the size of the hall could be determined through structural remains, either currently extant, or present when an architectural or archaeological survey had been done.²⁰ Secondly, the amount of the resource within the landscape feature needed to be identified. As with the household size, the precise amount of resource obtained from the landscape sites is unknown, due to the lack of surviving records. In order to project a possible amount of resource based on similar land types the surviving early sixteenth-century rentals and account-books of the landed estate of the bishops of Dunkeld and St. Andrews have been used.²¹ Although the exact area which the landscape feature covers is not known, a standardised area unit of five metres by five metres has been used in order to create the area boundary needed for the formula, which for the mills is a possible area covered by the mill lands. It is understood that the actual area could be more or less than this measurement depending on the size of the mill, but using this as a constant provides a foundation element on which to compare the sites assessed to each other.

B.6.2.: Stage 1: Estimating the Population of the Noble Residence

Eadie's model for estimating the maximum number of guests in a hall is based on a combination of modern restaurant guidelines and known requirements for medieval hospitality from the *Le Menagier de Paris* for determining the space required for each individual. In order to determine the amount of space required for serving around the tables in a hall, Eadie has combined Carr's dimensions for arranging a

²⁰ As some of the sites, such as Auldbar, were demolished in the twentieth century, older surveys of the structures have been used, relying mainly on MacGibbon and Ross and the nineteenth-century O.S. maps when possible.

²¹ The lands discussed in this text are similar in both the physical and social environment. A. Mylne, R. K. Hannay, and F. C. Eeles, *Rentale Dunkeldense: Being Accounts of the Bishopric (A.D. 1505-1517)* (Edinburgh, 1915).

restaurant²² and Woolgar's demonstration of the common U-shaped dining arrangement (see Figure B.6.1)²³ to create dimensions for the space required for serving: a high table 60-centimetres from wall behind²⁴ and 130-centimetres on the sides,²⁵ tables down length of the hall 70-centimetres apart from each other and 90-centimetres from the wall, and 140-centimetres between the high table and the lower tables.²⁶ Eadie uses measurements of table size for the high table to be a width of 100-centimetres and the lower tables 80-centimetres. The accuracy of these measurements has been confirmed by an assessment of surviving medieval furniture.²⁷ At the tables, each person is given 65-centimetres of space, except the lord, who is given 95-centimetres to accommodate a chair rather than a bench. Combining the spaces required for serving against the length of the hall, the number of guests can be determined as follows:

Lower Tables

$$L - 340 \text{ cm} = \text{table length (N)}$$

$$N \div 65 \text{ cm} = \text{Guests per table side (K)}$$

$$K \times 4 = \text{Total number of guests seated at low tables (T)}$$

High Table

$$L - 260 \text{ cm} = \text{table length (N)}$$

²² Eadie, 'Functions and Classifications', p. 86.

²³ Eadie; 'Functions and Classifications'; Woolgar, *Great Household*, p. 162.

²⁴ The arrangement sometimes has the lord's table right up against the main fireplace, in which case a screen was most likely used to ensure that the temperature at this table remained bearable. This arrangement can be seen in the January calendar page of *Les TresRiches Heures du Duc de Berry*.

²⁵ Served from the front.

²⁶ Eadie, 'Functions and Classifications', pp. 86-87.

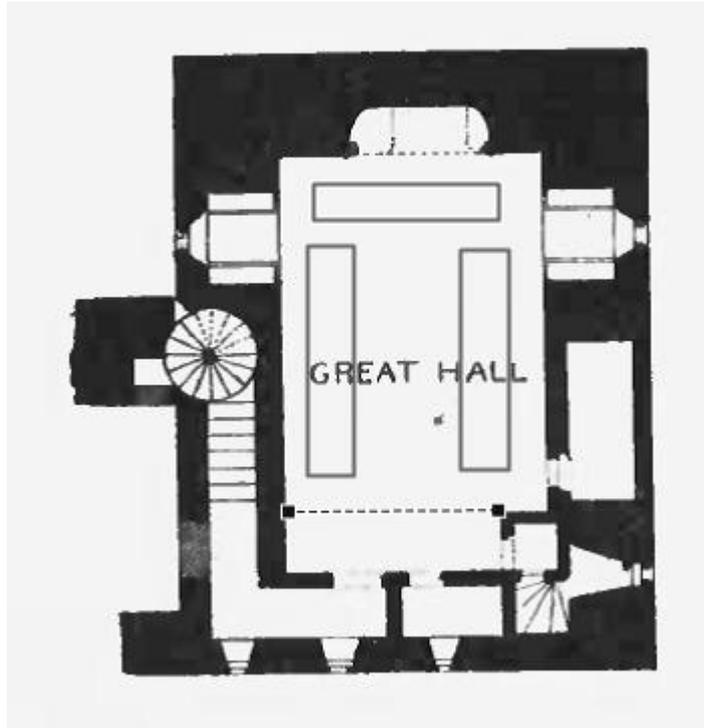
²⁷ P. Eames, *Medieval Furniture* (London, 1977).

$N - 95 \text{ cm} = \text{high table guest room (K)}$

$K \div 65 \text{ cm} = \text{guests at high table (G)}$

Total Number of Diners in the Hall

$$P = \text{Lord} + T + G^{28}$$



FigureB.6.1: U-Shape Dining Arrangement in Inverquharity [plan from MacGibbon and Ross]

This formula provides a good indication of the maximum number of guests that the hall allows for, but does not include serving staff. In *Le Menagier de Paris*, forty guests required two esquires for wine, two stewards to seat guests, one sewer (attendant) per table, and two servants per table.²⁹ The number of esquires generally required to serve a hall can be listed as a ratio of 1:10. On top of this there are three

²⁸ This is discussed in K. Buchanan, 'Social, Geographical, and Structural Environments of Fourteenth and Fifteenth Century Douglas Castles' University of Stirling (2010) [unpublished Masters Dissertation], pp. 39-41.

²⁹ E. Power, *The Goodman of Paris (Le Menagier de Paris)* (London, 1992), p. 160.

more people assigned to each table in the hall. Woolgar suggests that a typical table would have seated four people, two on each side. Dividing the number of guests by four provides an estimate for the number of tables in the hall to make the U-shaped dining pattern. The number of tables is then multiplied by three and added to the general number of serving staff to find the maximum number of household staff needed for a feast.³⁰ This organisation can be written as follows:

$$Total\ Servants = 3\left(\frac{P}{4}\right) + \frac{P}{10}$$

Although the need for structural measurements for this aspect of the project requires the physical presence of the building or at least some surviving architectural survey, thus drastically reducing the number of properties to be included, there are still significant issues related to how little scholars know about the use of space in the structures that survive. Most of the measurements of the hall have come from nineteenth-century surveys taken from MacGibbon and Ross. The interior length of the hall, when not mentioned by MacGibbon and Ross as in their description of Affleck,³¹ has been measured according to the scale they provided and converted into centimetres (see Figure B.6.2).

³⁰ It is possible that staff were included in the household to take care of the horses and other livestock who were additional to the serving staff for the feast. However, it is also likely that people performed multiple tasks, especially when a higher number of staff was required, so the number calculated here is the one used in the later gravity model calculations.

³¹ MacGibbon and Ross, *Castellated and Domestic Architecture*, vol I, p. 250.

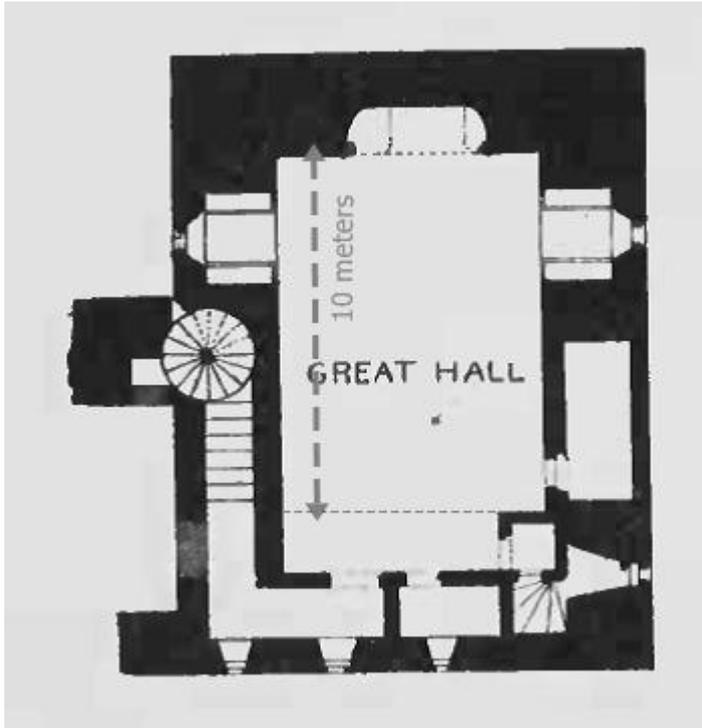


Figure B.6.2: Inverquhar Hall measurement [Plan from MacGibbon and Ross]

The following is an example of how the hall plan of Inverquhar in Figure B.6.2 has been used to determine both the number of guests that the hall would have been able to accommodate and the number of serving staff required for the maximum number of guests.

Lower Tables

$$1000\text{cm} - 340\text{cm} = 660\text{cm}$$

$$\frac{660}{65} = 10.15 = 11$$

4(11) = 44 guests seated at the lower tables

High Table

$$1000\text{cm} - 240\text{cm} = 740\text{cm}$$

$$740\text{cm} - 90\text{cm} = 645\text{cm}$$

$$\frac{645\text{cm}}{65\text{cm}} = 9.92 = 10 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 10 + 44 = 55$$

Total Number of Serving Staff

$$Total\ Servants = 3\left(\frac{55}{4}\right) + \frac{55}{10}$$

$$TS = 3(13.75) + 5.5$$

$$TS = 41.25 + 5.5$$

$$= 47\ Serving\ Staff$$

Total Population of the Residence

Total Servants + Total Diners

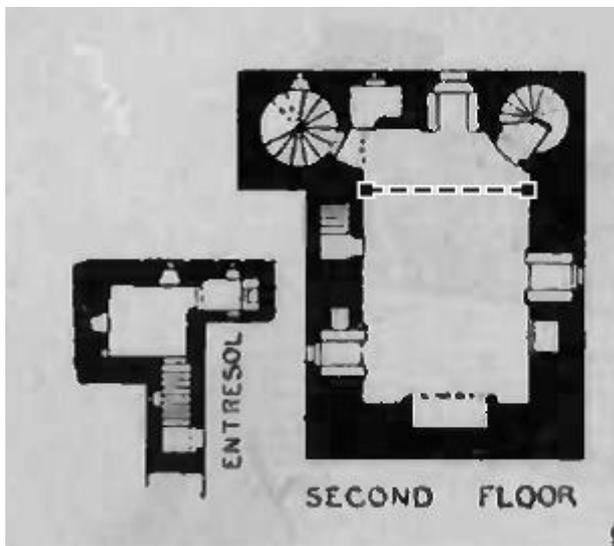
$$55 + 47$$

$$= 108$$

The total populations of the other residences have been determined using the same method. The results are listed in Table B.6.1, which gives the length of the hall (used to determine the number of guests), the total number of guests at the lower tables, the total number of guests at the high table, the total number of diners (used to determine the number of serving staff), and the overall total number of people present during the projected maximum capacity feast. The mathematical work for each number can be found in Appendix C.

Table B.6.1: Maximum Feast Population

<u>Place</u>	<u>Hall</u> <u>Length</u>	<u>Lower</u> <u>Table</u> <u>Guests</u>	<u>High Table</u> <u>Guests</u> + <u>Lord</u>	<u>Total</u> <u>Diners</u>	<u>Serving</u> <u>Staff</u>	<u>Total</u>
Affleck	696	24	7	31	27	58
Broughty	1051	44	12	56	48	104
Edzell	700	24	7	31	27	58
Glamis	1307	60	16	76	65	141
Inverquharity	1000	44	11	55	47	102
Redcastle	1174	52	14	66	57	123

B.6.2.a: Affleck*Figure B.6.3: Affleck [Plan from MacGibbon and Ross, vol. 1]*

Affleck or Auchenleck Castle is located in the parish of Monikie between the Monikie Burn and the Pitairlie Burn. It was built in the late fifteenth century and Tranter suggests that it was a ‘free-standing tower-house,’ which is unlikely considering the lack of space for features required for a noble.³² The external measurements given by MacGibbon and Ross are 11.43-metres by 8.1-metres with the inside rooms measuring 8.12m by 4.93m.³³ There is no kitchen provision within the tower, so it must be assumed that this structure was one of a wider complex of other structures. The entrance to the tower was on the east side opening into a small entrance lobby before the ground floor was divided into cellar chambers. A stair leading up to the first and second floors is in the south-east corner of the tower, partly contained with the small jamb. The first floor is vaulted and has three windows with seats but no fire-place, and was probably used as both a living and serving space. The chamber on the second floor also has three windows, above those on the first floor, with a large fireplace set in the north wall. A stair leading to the upper floors is in the south-west corner, and if a screen existed in this hall it is likely that it was placed separating these two stairs from the rest of the chamber.³⁴ Access to and from the various levels of the tower was controlled by this area, whether for service or the noble household.

³² Tranter, *Fortified House*, Vol. 4, p. 93.

³³ MacGibbon and Ross, *Castellated and Domestic Architecture*, vo. I., p. 250.

³⁴ There is no indication of a screen division in either MacGibbon and Ross’s description or Tranter’s, but it is likely there was one. This castle is now privately owned and closed to the public for viewing, so access to investigate the remains for this project was not gained.

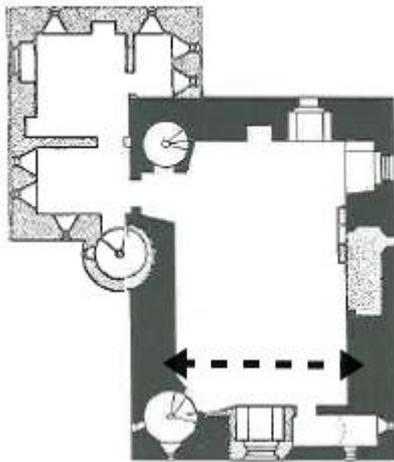
B.6.2.b: Broughty

Figure B.6.4: Broughty [Plan from Walker]

The original structure of Broughty Castle was finished in approximately 1493;³⁵ however, after deterioration due to lack of care from 1603, it was restored and added to in the 1860s by Robert Rowand Anderson as a defensive battery for the government. The restoration kept, though evidently heavily altered, the main tower of the structure, which currently is covered in harling.³⁶ Although the addition of a second tower in the north-western corner has changed some of the evidence for assessing the access between the main tower and other features, enough of the elements within the main tower remain to strongly suggest the hall size. The external measurements of the main tower are 13.56-metres by 10.21-metres and the building is entered from the south. The ground floor was divided into two vaulted compartments. Walker suggests that the western room may have been a kitchen with a direct service stair in the north-west corner leading up to the first floor. There is no indication of a fireplace, though it could have been removed during the nineteenth-century construction, but given the style of other contemporary towers it is likely the

³⁵ MacGibbon and Ross, *Castellated and Domestic Architecture*, vol, IV, p. 386.

³⁶ N. Tranter, *Fortified House*, vol. 4, p. 100.

kitchen was in a separate attached building, possibly attached to this vault as a service space. The south-west corner stair would most likely have been the service stair.

There are two main windows on the first floor that are known to be original, the western one now being the entrance to the new structure. The southern window may also have been original, though possibly enlarged by Anderson. A large closet situated in the east wall, interpreted as the great hall fireplace by Walker, was most likely a garderobe with a small window serving the main space of the hall. If this room was the hall, it is possible that there was a small screen drawn across the southern part of the wall, including the southern window and garderobe for use behind the service screen. This arrangement would suggest that within this tower there was a clear delineation of service space and living/entertaining space with access to the service stair controlled by a screen on the southern side of the wall. Access to all levels of the tower was also achieved through this stair, meaning that there was little separation between the service space and residential space in this tower when it came to access routes.³⁷

³⁷ F. Mudie, D. M. Walker, and I. MacIvor, *Broughty Castle and the Defence of the Tay*, (Dundee, 1970), p.91-95.

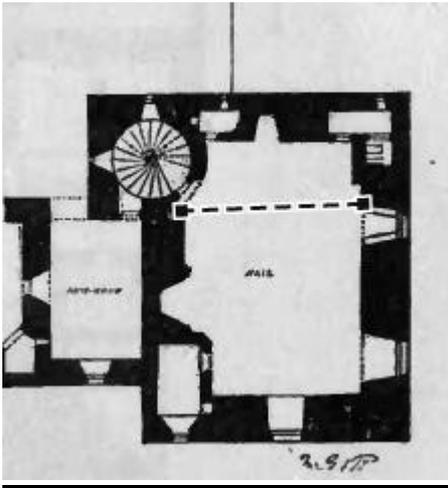
B.6.2.c: Edzell

Figure B.6.5: Edzell [Plan from MacGibbon and Ross, vol 1]

Edzell Castle's construction was centred on a four story L-shaped tower built in the south-west corner of a courtyard probably constructed by David Lindsay, 9th Earl of Crawford. It is situated at the entrance of Glen Esk, north of the confluence of the River North Esk and the West Water, closer to the West Water. When exactly the oldest tower at Edzell was built remains contested. According to MacGibbon and Ross's interpretation of the details of the tower, the inverted keyhole loops, the protruding staircase, and the more ornamental checked appearance of the corbels point to a late fifteenth-century origin.³⁸ More recent interpretation places the original construction date in the early sixteenth century, Tabraham to the 1530s³⁹ and the current guidebook to the 1520s.⁴⁰

The main entrance to the courtyard in the sixteenth century was from the south with the entrance to the tower on its west side against which a new range was built during

³⁸ MacGibbon and Ross, *Castellated and Domestic Architecture, vol. I*, p. 359.

³⁹ C. Tabraham, *Scotlands Castles*, p. 94.

⁴⁰ Historic Scotland, 'Edzell Castle and Garden,' (2007), p. 6.

a later phase of construction. The current guidebook shows the original layout of Edzell as a tower with a kitchen range to the north-east.⁴¹ Due to the placement of the entrance of the tower at the mid-point of the north-west wall, this seems unlikely as this suggests a significant distance outside between the kitchen and the hall on the first floor. It is more likely that the kitchen was in an earlier phase of the hall range that sits west of the tower with a direct inside link between the kitchen and the tower entrance. However, without further archaeological excavation, the earlier phases of construction remain a mystery.

Simpson measures the tower at 13.41-metres by 10.36-metres with walls starting at a thickness of 2.13-metres and decreasing to 1.7-metres at the first floor. The first floor consisted of the hall measuring 10.05-metres by 7.16-metres, with two large windows in the southern wall, one large window in the western wall, and a 2.13-metres wide fireplace in the northern wall. A smaller fireplace in the eastern wall and joist holes east of the large fireplace on the northern wall at a height of 2.05-metres suggests a screen dividing the room into two sections, garderobe access being the smaller of these.⁴² The fireplace and light source in the north-east wall would have enabled the screened entrance to function as a work and serving space for some food preparation and re-heating.

Interestingly, all access to and from the hall is dictated through the screen and the stair in the north corner. There is a service stair from the cellar to the screened-off portion of the hall on the first floor, but the main access for the noble house and

⁴¹ Historic Scotland, 'Edzell Castle and Garden,' (2007,) p. 6.

⁴² W. D. Simpson, (1930-31) 'Edzell Castle,' *Proceedings of the Society of Antiquaries of Scotland*, 65, pp. 122-125.

guests, and service up to the second-floor chamber, would all have been directed by the north stair. This presents an interesting division of public and private space along with the working and living space for the serving staff and noble residents and guests. However, the size of this hall seems fairly small given the status of Lindsay and it is likely that this room was used as a more private dining space for Lindsay and his closest family and friends. The main hall was likely part of the original external courtyard. Nevertheless, since confirmation of this would require further excavation, the current hall measurements will serve for this assessment.

B.6.2.d: Glamis

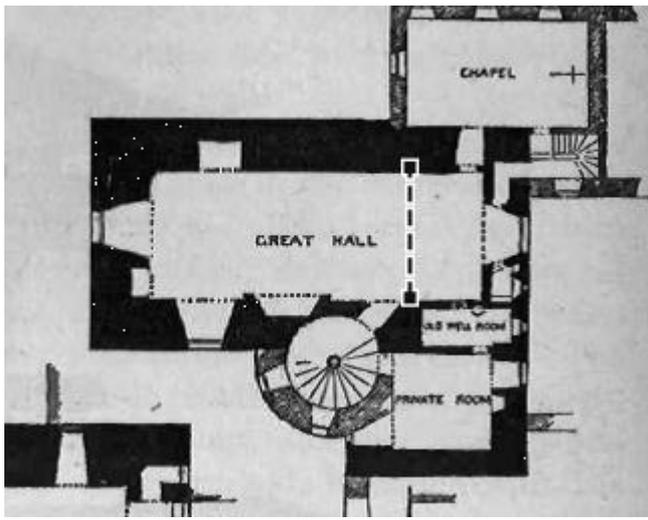


Figure B.6.6: Glamis [Plan from MacGibbon and Ross, vol. 2]

Glamis Castle was the main seat of the Lyons. Traditionally there was some form of lordly residence at this site from as early as the eleventh century,⁴³ but John Lyon, second laird of Glamis began work on what is the current structure between 1404 and 1435. The first stages of construction on Glamis Castle as it currently stands began in the early fifteenth century and are embedded within its current structural layout.

⁴³ J. Fordun, *Joannis de Fordun Scotichronicon Cum supplementis et continuatione Walteri Boweri, insulae sancti columbae abbatis. E codicibus MSS. Editum. cum notis et variantibus lectionibus. Praefixa est ad historiam scotorum introductio brevis, cura Walteri Goodall* (Edinburgh, 1775).

Slade believes that the earliest part of the structure was the south-east wing, followed by the central block known as the 'Great Tower'.⁴⁴ Although much of the structure was altered by renovations and additions over the next four-hundred years, there appears to be enough structural evidence to make some basic observations about the original construction of the tower, how it functioned, and its role as a noble residence. To this end, Slade included plans of the interior drawn up by the RCAHMS showing the arrangement of the ground floor to second floors.

To the north-east of the tower is a kitchen block with immediate access to the cellars at the ground level and a service stair to the upper floors. This placement of a kitchen arrangement conforms to the typical style of the time in Scotland. The first floor of the tower is labelled a 'laigh hall' or lower hall, which could have been used to entertain a larger number of guests if the upper hall was inadequate for a large feast. It was most likely used as a receiving chamber, as there appears to be no provision for anything like this on the ground floor. Slade mentions some evidence for a fireplace on this level in the north wall, but provides no indication of having a worked head or jamb, which was not noticed by MacGibbon and Ross.⁴⁵ The great hall has then been interpreted as being on the second floor. Slade estimated that the original length and width of the hall before the addition of a large chimney in the west gable was approximately 17.07-metres by 6.71-metres.⁴⁶

The main access to the hall is from the main stair in the south-east corner of the block. The service stair comes from the north-east corner. The plans show some wall

⁴⁴ Slade, *Glamis*, p. 14.

⁴⁵ MacGibbon and Ross, *Castellated and Domestic Architecture*, vol. 2, p. 120.

⁴⁶ Slade, *Glamis*, p. 17.

division all the way across the hall that separated the service stair from the entrance to the seventeenth-century chapel addition, the entrance to which is cut through the original wall. The original entrance access, as pointed out by Slade, would have been in the south-east corner, with a long stair through the south-west wing.⁴⁷ It is predicated that a screen was drawn across the east end of the hall and access to the main hall would have been through this screen passage. The main fireplace sits in the southern wall, also just off the current entrance with windows in the south wall in the north. Other windows may have existed but later additions to the structure have made it impossible to distinguish these.⁴⁸

B.6.2.e: Inverquharity

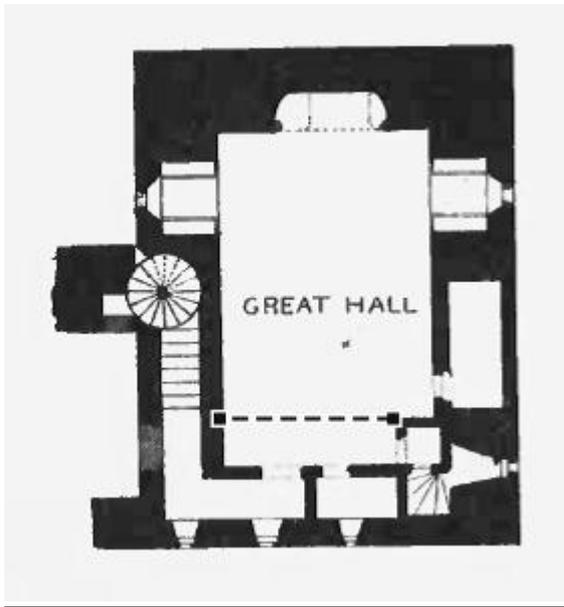


Figure B.6.7: Inverquharity [Plan from MacGibbon and Ross, vol. 4]

⁴⁷ Ibid.

⁴⁸ MacGibbon and Ross, *Castellated and Domestic Architecture*, vol. 2, p. 116; Slade, *Glamis*, p. 18.

The property of Inverquharity was given to Walter Ogilvy of Auchterhouse in 1420. It sits on a promontory overlooking the Carity Burn just upstream from its confluence with the Prosen Water. The structure has been interpreted as having been an L-shape tower house, though the eastern wing was ruined by the 1840s when MacGibbon and Ross surveyed the structure. They measured the tower as 13.71-metres by 10.05-metres with walls 2.28-metres thick.⁴⁹ Now privately owned the structure was restored in the 1970s when a new building was placed where the east wing had been and the tower restored to living conditions. A well was found in the basement of the east wing, but no other observations were made about the composition of the rest of the complex.⁵⁰

The tower that remains contains two vaulted floors, the lower of which was subdivided by a timber entresol into two levels. The second floor was fully vaulted and has been traditionally interpreted as the hall; however, there is a possibility the hall was in a separate building and that the second floor was actually a chamber, making the tower an accommodation block, as the third floor room, generally interpreted as the main chamber, has no direct access to a garderobe. Tranter pointed out that the first floor which divides the lower vault was common for servant accommodation, but without an obvious fireplace arrangement or garderobe access this was probably used as a receiving room or a storage space.⁵¹

Nevertheless, the second floor to the tower has a unique access arrangement that seems to work as a hall. The main entrance was in the eastern wall, though there is an

⁴⁹ MacGibbon and Ross, *Castellated and Domestic Architecture*, vol. 3, p. 282.

⁵⁰ E.J. Talbot, 1972, Ordnance Survey.

⁵¹ N. Tranter, *Fortified House*, vol 4, p.133.

interesting bend from the east wall through the west making the entrance to the hall from the north and possibly creating some serving space. In the north-west corner there is a small room with steps leading down to a low window, suggesting a change in the level of the floor where the low window might indicate the original floor level. It is possible that the wall enclosing this small room was a later addition, but a screen might have been drawn across the room at this point. All access into the hall would have been directed through the screen and the stair hall. There appears to be a small service hatch between the stair and hallway that was likely used for direct service access between a kitchen in the east wing, as there is no other immediate connection to kitchen space, suggesting that this room did function as a hall. If the second floor was the main hall of the building this could be representative of the status of the family, which somehow merited the compression of features of noble authority within the tower; however, it is likely that the east wing and other possible outbuildings contained many of these features. This building has been included in this study mainly to represent the interaction of smaller households and their landscapes and to further test the interpretation of the second floor as the hall.

B.6.2.f: Redcastle

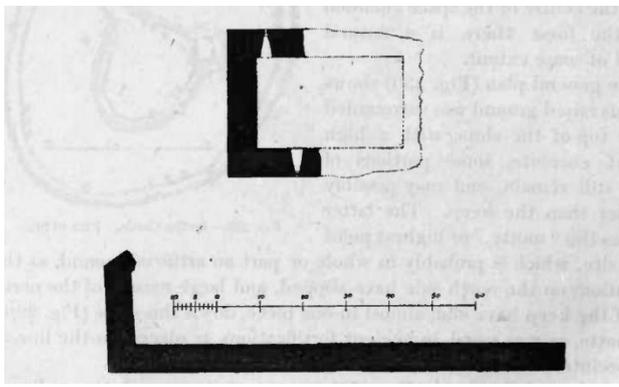


Figure B.6.8: Redcastle [Plan from MacGibbon and Ross, vol 1]

There is evidence that a structure has been at Redcastle since the twelfth century but it is unknown when the current ruins were constructed.⁵² MacGibbon and Ross suggest that the ruins are a mix of a thirteenth century wall and a fifteenth-century tower house. At the time of MacGibbon and Ross's survey, the tower only consisted of some of the northern wall with elements of the eastern and western walls, though an outline of the extent of the tower could be seen.⁵³ Remarkably, the site was in a similar condition in 1940-41 when W. D. Simpson surveyed the estate. The tower's external measurements were 13.41-metres by 9.98-metres with walls 1.67-metres thick and stood four stories tall. The tower appears not to have been vaulted and Simpson suggests the first floor was the hall, given a large fireplace visible in the north wall and the large window, possibly with seats, in the east wall.⁵⁴ Access between these floors is unknown, though it is assumed that stairs were in the south-west or south-east walls as there is no evidence for stairs in the surviving wall structure. However, due to the lack of physical evidence at Redcastle, only an estimated measurement of the presumed hall can be made for a maximum possible capacity of entertainment.

B.6.3: Stage 2: Identifying Landscape Feature Resource Amounts

The landscape features addressed in this section have been reduced to the mills due to the high number of sites which included these features, their perceived importance

⁵² This statement is based primarily on the recorded ownership of the site by Walter de Berkeley, chamberlain of King William, in the later 12th century, passing through his daughter into the hands of the Balliols. For the ditches of this early phases, see Gibson, A-M and Pollock, D, 'Red Castle (Inverkeilor p): ditches', *Discovery and Excavation in Scotland (1983)*, p. 34; W. D Simpson also discussed the building in *PSAS*, 75 (1941).

⁵³ MacGibbon and Ross, *Castellated and Domestic Architecture, vol. I*, pp. 280-281.

⁵⁴ Simpson, 1940-41, Red Castle of Lunan Bay, p. 121.

to late fifteenth- and early sixteenth- century society given their appearance in the documentary evidence, and the potential for comparing some sites with these different features. In order to predict the amount of resources present at the mills, an average of the income from grain found in the bishopric of Dunkeld accounts was taken. The average weight of grain was calculated through the weights and measurements listed by SCAN, converting volume into weight according to the substance and the standard area of five square metres. These numbers were used to determine the *wna* value of Jochim's gravity model.⁵⁵

Table B.6.2: Volume in Liters of Medieval Scottish Grain

Measurement	Amount	Volume - Liters	Weight in Barley - Kilograms	Weight in Oats Kilograms	Weight in Wheat Kilograms	Weight in Rye Kilograms
Chalder	16 Boll	3386.624	2063	1463	2604	2388
Boll	4 Firlots	211.664	128.9	91.44	162.8	149.2
Firlot	4 Pecks	52.916	32.23	22.86	40.69	37.31
Peck	4 Lippie	13.229	8.056	5.715	10.17	9.326
Lippie		3.037	1.85	1.312	2.335	2.141

In order to calculate an estimated resource weight from the mills, the rentals from 68 mills listed in the Dunkeld accounts were added up, providing a sum of 112 Chalder

⁵⁵ S. Gershtein & A. Gershtein, Instant Weight to Volum and Volume to Weight Conversion (2013), <<http://www.convert-me.com/en/convert/weight2volume/>>. [Accessed 24, February 2014].

and 6 Bolls of victual and 51 Chalder and 14 Boll of barley.⁵⁶ The general amounts identified were confirmed through similar amounts noted in the accounts from St. Andrews.⁵⁷ The weight of the barley was determined using the figure in Table B.6.2:

$$51 \times 2,063 = 105,213$$

$$14 \times 128.9 = 1,804.6$$

For a sum total of Barley:

$$105,213 + 1,804.6 = 107,017.6kg$$

and an average of 1,573.79-kilograms of Barley (about 12 Bolls 1 Firlot) per mill. As the victual is a non-specific grain type, the weight used to calculate the rest of the grain was Chalder = 2151.67kg and Boll = 134.48kg, an average of the weights of Oats, Wheat, and Rye. The weight of victual was then:

$$112 \times 2151.67 = 240,987.04$$

$$6 \times 134.48 = 806.88$$

For a sum total of victual:

$$240987.04 + 806.88 = 241793.92 Kg$$

and an average of 3555.79-kilograms (about 1 Chalder and 3 Bolls) of victual per mill.

Using the following:

$$I = \frac{Kwna}{d^2}$$

⁵⁶ A. Mylne, R. K. Hannay, and F. C. Eeles, *Rentale Dunkeldense: Being Accounts of the Bishopric (A.D. 1505-1517)* (Edinburgh, 1915).

⁵⁷ R.K. Hannay, *Rentale Sancti Andrea, Being the Chamberlain and Granitar Accounts of the Archbishop in the Time of Cardinal Betoun 1538-1546* (Edinburgh, 1913).

When addressing the interaction between the castle and the mill, *wna* has been standardised to refer to 1 Chalder 15 Bolls and 1 Firlot in an approximated area of 25-metres², equalling to 128239.5, which can be written as follows:

$$wna = (1(2151.67) + 3(134.48) + 12(128.9) + 1(32.23))(25)$$

$$wna = 4134.14(25)$$

$$wna = 103353.5$$

This value is used for every *wna* value when mills are considered. This provides the weight, number of individuals, and the area for the grain mill, which in turn provides a ‘mass’ of the mill from which the draw can be calculated.

B.6.4: Stage 3: Applying the Gravity Model

An example of how this interaction with the mills has been figured for each site is demonstrated for Affleck below:

Affleck at Maximum Capacity

$$I_{max} = \frac{58(103353.5)}{1120^2}$$

$$I_{max} = \frac{5994503}{1254400}$$

$$I_{max} = 4.778781091$$

Affleck at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{1120^2}$$

$$I_{min} = \frac{1033535}{1254400}$$

$$I_{min} = 0.823927774$$

Not surprisingly, there is a significant difference in the interaction of a minimum household and that of a maximum household. In order to identify the interaction between the features within the site and to compare the sites being addressed in this study to each other, the ratio of the interaction between the minimum and maximum households must be established. This calculation has been done by dividing the minimum interaction by the maximum to give us a value of *relative interaction* (hereafter RI value), which can be written as:

$$RI = \frac{I_{min}}{I_{max}}$$

Therefore, the RI of Affleck can be figured as follows:

$$RI = \frac{4.778781091}{0.823927774}$$

$$RI = 0.172414$$

Table B.6.3 lists the places in relation to their mill sites, their maximum population K , the distance in metres between places, the I_{min} value figured with $K=10$, the I_{max} value, and the final RI value.⁵⁸

⁵⁸ I_{min} has been established as 10 household members for non-feasting time. I_{max} was figured according to Eadie's method. See Table B.6.1.

Table B.6.3: Measurements of Relative Interaction with Mill Sites

Place	K=Maximum Capacity	Distance in metres	I _{min}	I _{max}	RI
Glamis	141	2570	0.156480038	2.206368529	0.070922
Redcastle	123	1390	0.534928316	6.579618291	0.081301
Broughty	104	2490	0.166696505	1.733643651	0.096154
Inverquharity	102	409	6.178436284	63.0200501	0.098039
Affleck	58	1120	0.823927774	4.778781091	0.172414
Edzell	58	1970	0.266313226	1.544616713	0.172414

B.6.5: Discussion and Implications

First, the I_{\min} provides a clear example of how strong the natural pull for interaction is between the noble residence and the mill. Inverquharity Castle has an extremely strong tendency for interaction between these sites, largely due to the unusually close proximity of the mill to the noble residence. This result suggests that access between these points would have been relatively easy, which would have resulted in more consistent connectivity. Similarly, all of the other sites in this study are separated from the baronial mill by more than a kilometre, resulting in a much weaker interactive connectivity. Subsequently, the values from the gravity model for these sites can only be compared to each other when looking at a ratio of interaction in the RI value.

Table B.6.3 demonstrates three different focuses developed from using the gravity model to identify the strength of interaction between the main residence and the mills. First, the I_{\min} provided an indication of what sort of interaction would have been expected during a minimum capacity of a total of ten household members and serving staff. Second, the I_{\max} demonstrated what type of interaction would have been expected at the maximum capacity calculated from the maximum number of guests able to fit within the confines of the hall and the appropriate number of servants. Finally, the RI values averaged these types of interaction to allow each property to be compared to the other.

The main focus of the gravity model is to understand the draw for interaction between two places, in this study the noble residence and the attribute mill. The numbers indicated from the gravity model stress the strength of the draw for interaction, thus the higher the number the stronger the likelihood of interaction between the two places. This formula was inversely related to the distance between the features, so it was expected that there would be a direct correlation between the greatest distance and the least strong draw for interaction. This draw was also directly proportional to the population of the households, so when the distance was great and the household small the pull for interaction was weak. Both Glamis and Broughty, having mills over two kilometres away, demonstrate this with their minimum household of only ten. Consequently, when the distance between the two places was short, the draw for interaction was high, increasing with the size of the household. This situation was clearly demonstrated at Inverquhar, where the draw for interaction remained high for both the I_{\min} and the I_{\max} . Due to the effect of household size on the draw for interaction, the ranking of the pull for interaction

changed when the full household was present. Inverquharity stayed high due to the very close proximity of its mill, but Redcastle and Affleck follow it in the ranking of strength of pull in the I_{\max} , a reversed ranking in the I_{\min} . Likewise, Glamis had the least draw in the I_{\min} , though in the I_{\max} it ranks third least, undercut by Edzell and Broughty.

In order to compare the rates for these sites with each other it was important to set a rating that was confined between 0 and 1. This calculation was done by taking the ratio of the I_{\min} to the I_{\max} , which indicates the consistency of the interaction within the site. From this ratio it was clear that Glamis consistently had a weak draw for interaction, followed by Redcastle. Broughty and Inverquharity rested in the middle of this ranking, setting an average draw for interaction. Affleck and Edzell were at the top of the RI ranking, meaning that the distance between the I_{\max} and the I_{\min} was the least for these properties. These properties were the most consistent in their interactive connectivity, indicating that between all the sites considered in this particular study Edzell and Affleck have the most effective arrangement for encouraging interaction between the noble residence and the mill.

B.6.6: Conclusion

This exploration of the gravity model is not intended to suggest that during the middle of a feast there was a surge of interaction between the noble residence and the mill, though there was likely an increase in interaction during the preparation for such a feast. Instead, highlighted here is that the layout and arrangement of the features of the noble landscape affect its penchant for interaction between features of

a consumptive and productive nature. The strength of the connection between these attributes of the noble landscape determines the effectiveness of the interaction during times of increased demand. It is understood that the distance has been calculated using Euclidian lines and does not account for further potential topographical obstructions. This assessment, however, can only be done with a greater understanding of medieval landscape and access routes, which are not likely to be obtained for the sites within this dataset.

There were two main benefits to testing the gravity model in this dataset: first, a greater understanding of the capacity for entertainment within these noble residences in Angus was gained. Second, a starting point for understanding how likely interaction between the noble residences was with the surrounding features and subsequently what sort of impact household size might have had on the surrounding environment was identified. With regard to household size, it is most important that even structures that appear to have had a very small hall, such as Edzell and Affleck, still could have entertained 31 diners and accommodated a serving staff of 27. Similarly, structures that were only slightly larger, such as Broughty and Inverquharity, could accommodate nearly twice as many guests and staff for entertaining. The status of the lords was a key factor in the hall size, seen by the large hall at Glamis. Given the status of the Lindsays at Edzell, it is surprising that the hall was not fitted for more guests, which makes it seem likely that there was another larger hall within the complex. However, the size of the hall at Edzell may be indicative of the interactive arrangement of lesser noble residences.

The gravity model highlighted some interesting facts about the strength of the draw for interaction at many of these locations. Inverquharinity's high maximum capacity and nearby mill indicates a very strong draw for interaction at all times. When assessed individually, the Inverquharinity landscape was highly effective at connecting the noble residence with the productive landscape. The ranking for the strength of the connectivity of the sites changes between the I_{\max} and the I_{\min} , aside from Inverquharinity. This change identifies that some sites might reach a higher efficiency with a certain saturation of population. For example, the great distance between the noble residence and the mill at Glamis is somewhat compensated for by the increase in population. The least amount of change occurs at Broughty and Edzell, indicating that these properties retain a fairly continuous rate of interaction.

Interestingly, looking at the sites as they compare to each other through the RI values, Edzell and Affleck both have the strongest relationships to the mill sites. These sites overall have the most effective layout for the distribution of grain within their landscape and would have placed the least pressure on the surrounding landscape with the increase of population. Glamis and Redcastle are at the bottom of the list, suggesting the arrangement of their estates was less effective at distributing grain. However, it is important to note that Glamis, Redcastle, Broughty, and Inverquharinity all have significantly lower RI values than Edzell and Affleck, suggesting a large deviation in the effective interaction.

This exploration of the natural draw of interaction with the landscapes of noble residences provides valuable information about how the arrangement of the noble landscape can affect the effectiveness of this interaction. The application of the

gravity model within this dataset is clearly limited by the lack of information known about the noble landscapes in this area. The development of this model will benefit from its application within a context that has more defined variables and attributes, which might mean identifying a landscape with more documentation in the context of a different country and/or a later time period. Nevertheless, this study has identified the potential household size of these noble residences in Angus, which was revolutionary when Eadie developed the method for Irish castles, and has not been widely applied in the Scottish context. The exploration of the gravity model has revealed a quantifiable connection between the noble residence and the features around it. This application is unique as it specifically quantifies how the arrangement of the estate dictates the effectiveness of interaction between points of production and consumption, which is both new to the study of noble landscapes and the application of the gravity model. This assessment provides a basis on which the interactive spaces in the Scottish noble landscape can be compared to those across Europe during this time.

Chapter 7: Network Analysis

A core element of this research project involved providing a catalogue of the features within the built environment of the noble residences through the creation of a dataset of such residences in Angus between 1450 and 1542 and their associated attribute features. The purpose of assessing this data has been to establish any known parameters of interaction between the attribute features and the main residential structure, and how interaction between and among these spaces might have occurred. Chapters Five and Six have examined those sites where a reasonable level of physical evidence survives to support topographical locations and subsequently social interaction within the sites. This analysis helped illustrate which features were present in creating the environment of a noble residence and how these both encouraged and confined the social interaction within this context. Unfortunately, the need for surviving physical evidence has limited the data available for analysis, as many of the documented features and attributes are no longer physically present nor has any substantial evidence for their location been found. This restriction leaves a significant portion of information about the known makeup of the noble environments of Angus between 1450 and 1542 unaccounted for and without assessment. In order to incorporate the larger set of data the focus of assessment needed to be translated from a topographical to a topological format, requiring changes to questions asked of the data set. To implement this change of focus the final method of assessment placed the data into a series of networks directed by a new set of questions. Before those new questions are advanced, however, it is important to discuss what network analysis does and what benefits it has within an archaeological and historical framework, found in section B.7.1. Sections B.7.2-4

assess the dataset through four different questions which can clearly be addressed through network analysis.

B.7.1: The Use of Networks in Historical Contexts

One of the principal benefits of applying network analysis to this data is the ability to draw out the sites and their attribute features in a way that addresses their association with the site without geographical constraints. It is vital to remember that the baseline connection to the physical presence of the sites is still present, though not actively motivating the analysis. At this point it is important to address what networks can do, what sort of social questions they can help to answer, and how this can be applied to the project's data. Networks are primarily concerned with associations between places, objects, or people, and the patterns of these relationships.¹ The relationships can be assessed through different modes, that is between people and objects,² objects and places,³ or while looking at these relationships over time.⁴ This bi-modal approach is particularly important for a behavioural assessment of the entities in question. Although most of this approach's methodological background is based on Social Network Analysis, within the context of archaeology the process ends up being more characteristic of what Sindbaek

¹ T. Brughmans, 'Connecting the Dots: Towards Archaeological Network Analysis,' *Oxford Journal of Archaeology*, 29 (2010), p. 1.

² Watts and Strogatz, 'Collective Dynamics of 'Small-World Networks,' *Nature*, 393 (1998).

³ S. Sinbaek, 'The Small World of Vikings: Networks in Early Medieval Communication and Exchange', *Norwegian Archaeological Review*, (2007), p. 40.

⁴ C. Knappett, *An Archaeology of Interaction: Network Perspectives on Material Culture and Society* (Oxford, 2011), p. 74-82.

describes as a network reconstruction, rather than analysis.⁵ In this way much of the purpose within archaeological network analysis lies in uncovering network connections and the possible implications of such connections. Employing networks is useful as an experimental tool and another method to ‘test and explore properties of complex data-sets’; although networks do not necessarily reveal solid evidence for a specific connection.⁶ The intrinsic value of this method rests in how each node and link has been defined.

Taking Sindbaek’s description of archaeological network analysis as a method of recreating networks, rather than thoroughly assessing connections, this section attempts to reconstruct the associations (if any) that would have been part of common contemporary attitudes when a particular type of noble resident was mentioned. In this way, this stage of assessment is an attempt to define what the normative standards were within a late fifteenth- and early sixteenth-century mindset regarding the anthropogenic landscape of the noble environment. These definitions are helpful when assessing modern understandings of noble residential terms when they are not accompanied by specific attribute features. They also assist in further defining the specific links between certain noble residences and high or low status attribute features within a Scottish context. To do this, four different questions have been chosen, and networks built around answers to these questions. First, from the perspective of individual sites, two types of nodes were created representing the descriptive terms and the year of the document describing the site.

⁵ S. Sinbaek, ‘Broken Links and Black Boxes: Material Affiliations and Contextual Network Synthesis in the Viking World’ in C. Knappett ed. *Network Analysis in Archaeology: New Approaches to Regional Interaction* (Oxford, 2013), p. 71.

⁶ C. Knappett (ed.) *Network Analysis in Archaeology: New Approaches to Regional Interaction* (Oxford, 2013), p. 9.

These nodes were linked when the document used the specified descriptive term. The guiding question for this stage of assessment was: within the records of the individual sites were there patterns of how the site was described? The second set of analysis used the same definitions of nodes and links but expanded the range of assessment to address all of the descriptors over the entire time frame addressed by this study. This arrangement allows the following questions to be addressed: first, when looking at the complete data-set, were there any patterns demonstrating a link between the descriptors and the years they were used; second, is there a distinctive changeover time of attribute language used generally for noble residences? Next, the descriptions of the attributes and the noble residences were separated into two types of nodes in order to identify specific connections between attributes and noble residential terms. Finally, the nodes were defined as the descriptive terms and the noble families associated with these properties, allowing the assessment of any obvious patterns between certain noble families in Angus and the descriptors used for their associated properties.

B.7.2a: Stage 1: Patterns Within Individual Sites

The purpose of this first stage of network assessment was to address any patterns in the descriptions of the noble residences that might have occurred within the individual sites. It is important to address the material on this small scale where possible in order to create a basic foundation of understanding how these descriptions function within the context of one site over time. By identifying the relationships that an individual site had with the descriptors it was possible to

recognise possible phases of development, construction, and renovation to the physical property and to the legal rights attached to holding the property. Although one of the main purposes of this stage of assessment was to create a generalised code for describing and interpreting noble landscape features, this micro-scale form of assessment ensured that the individual circumstances and history of each site were not lost or forgotten in the assessment.

As stated above, there were two types of nodes within this section: one indicating the descriptive terms found in the documents relating to the property and the other denoting the documents relating the property categorised by year in order to indicate a temporal change. Links between these nodes have only been drawn when the node with the specified descriptor was found within the indicated document. Each property was drawn with these associations in a codified graph. Table B.7.1 outlines the descriptor codes used for the property and attribute features. The discussion section includes a selection of diagrams that demonstrate some change within the description of the property during the time in question. Graphs containing the individual site descriptions were drawn for all sites considered for this project and those not listed in the following discussion can be found in the associated site entry in Appendix A. At this stage the focus of the assessment was centred on consistencies and changes within the descriptors.

Table B.7.1: Descriptor Codes Used in Graphs

Code	Descriptor
C	Castle
T	Tower
F	Fortalice
M	Mill
P	Fishing
G	Garden
W	Woodland
S	Forest
A	Park
O	Orchard
B	Manor-house
D	Mansion
E	Chapel
L	Loch
H	Messuage
I	Place

B.7.2.b: Stage 1: Discussion

In searching for patterns of association within these diagrams, the main focus was on descriptors that remained constant at the property, that is whether the property was regularly described as being a castle with various attributes, or whether the terminology used to describe the main residential structure changed along with the associated attributes. It was important to determine if there was any validity in creating a link between a description of the noble dwelling and the other features and denoting these descriptors as distinctive terms, or if the terms were used interchangeably.

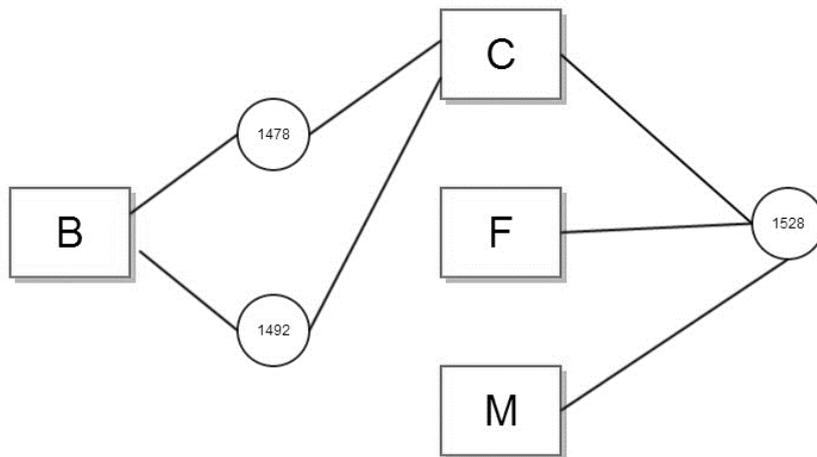


Figure B.7.1 – Graph of Auchterhouse⁷

The descriptions of Auchterhouse demonstrated in Figure B.7.1 cover a span of 50-years, a timespan adequate for substantial change of the property to have taken place. The most overwhelming consistency within this graph was the description of the property as a castle. Pre-1500 this site was qualified by the description of it also being a manor-house; however, in 1528 this was changed to being a fortalice and a mill.

⁷ RMS, *vol ii*, no. 220, no. 2098; RMS, *vol iii*, no. 305.

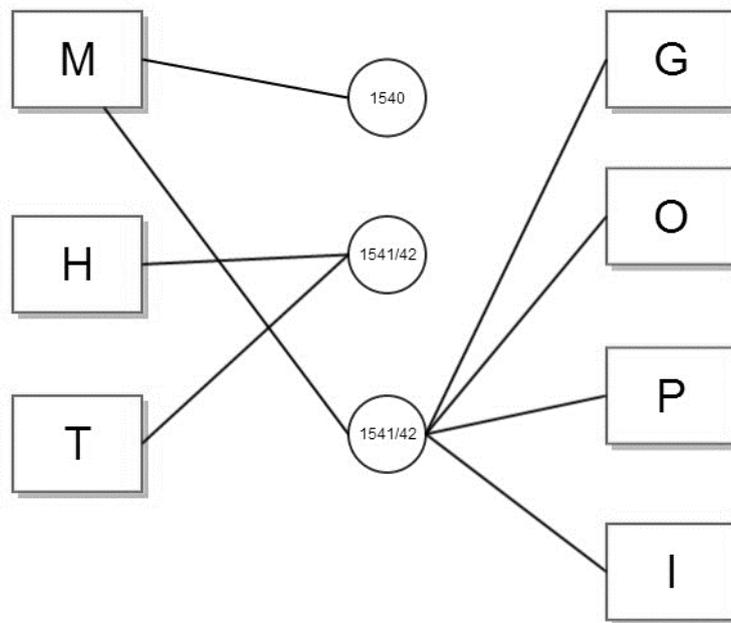


Figure B.7.2 – Graph of Auldbar⁸

The descriptions of Auldbar as demonstrated in Figure B.7.2 were given within a narrow chronological range, suggesting limited opportunity for significant change within the property. Interestingly, the two documents written in 1541/42 reveal different pictures of the property. The first labels the property as having a message and a tower. The second uses the term *place* rather than *message*, leaving out any other indication of a specific type of noble dwelling but adding an extensive list of attribute features. This change might suggest that the terms *message* and/or *tower* imply the inclusion of these other features. Likewise, the term *place* might have the implication of containing the tower as a symbol of lordship, but not necessarily including the other listed features.

⁸ RMS, vol iii, no. 2194, no. 2574.

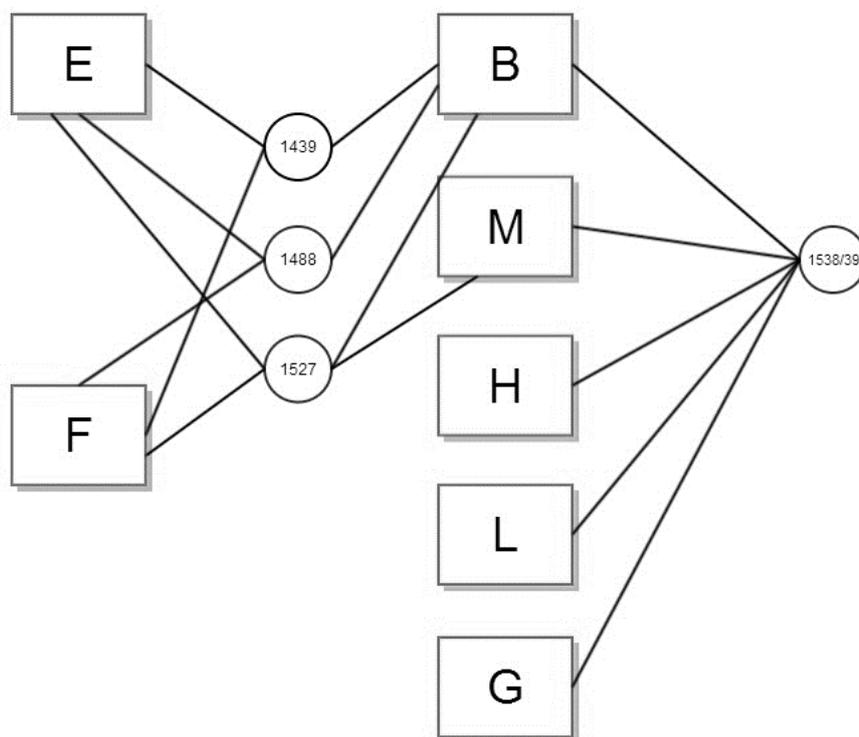


Figure B.7.3 – Graph of Baikie⁹

The descriptions of Baikie above in Figure B.7.3 cover a 100-year period, a timespan adequate for significant changes to have been made at the site.¹⁰ Nevertheless, over that century the site was consistently described as a manor-house. For the most part, Baikie was also described as a fortalice. By 1538/39, only 11 years after the previous description, a short period of time for major renovations (though not impossible as a complete rebuild could be done in about three years depending on the amount of work being done and the available labour)¹¹, the reference to a fortalice was omitted, but its labelling as a message with a mill, loch, and garden suggests that it either lost its fortalice or the term *message* potentially implies the inclusion of the

⁹ RMS, *vol ii*, no.178, no. 631, no. 1872; RMS, *vol iii*, no. 526.

¹⁰ Although the first date pre-dates the specified start date of this project, the author has included this description for comparisons sake.

¹¹ R.A. Brown, 'Royal Castle Building in England, 1156-1216', *The English Historical Review*, 70 (1955), pp. 353-398.

fortalice. The loss of the fortalice might have been possible if this referred only to external earth and timber features; however, Pont draws it with wall and crenellation, indicating a fortified house, so this was likely not the case.

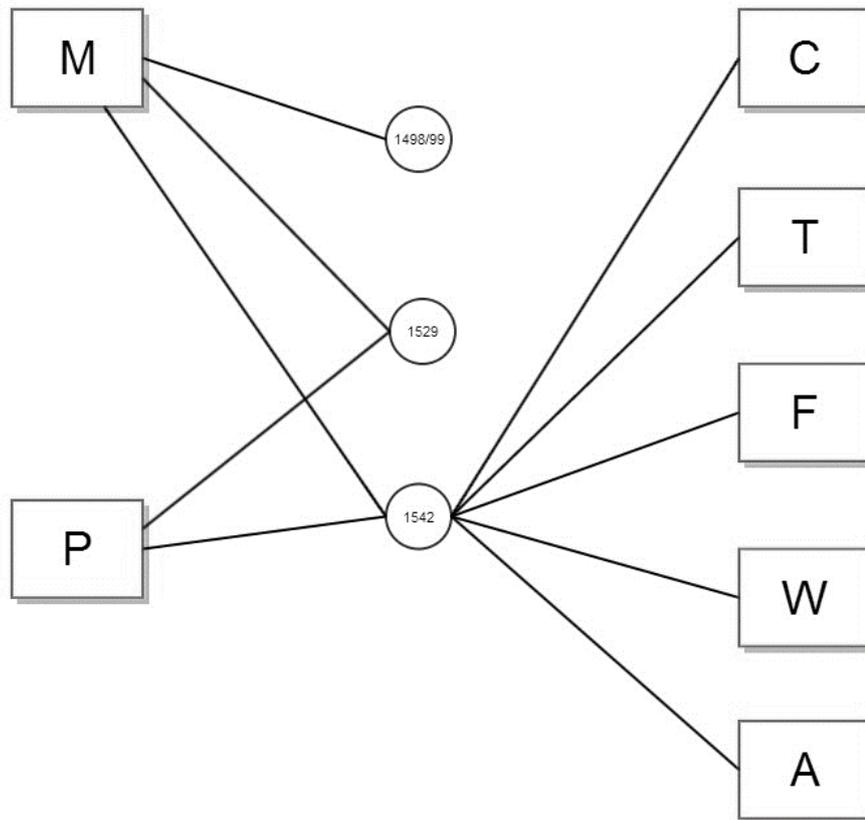


Figure B.7.4 – Graph of Bonnyton¹²

The descriptions of Bonnyton shown in Figure B.7.4 cover a 44- year period. There were significant changes in the descriptions of this property, especially in relation to the 1542 inclusion of noble residence descriptors, where previously industrial attributes were only mentioned as attributes of this barony. The description blossomed in 1542 to include three residential authoritative descriptions, castle,

¹² RMS, *vol iii*, no. 2623; GD185/1/49; GD45/21.

tower, and fortalice, and added woodland and a park to the mill and fishing rights of the property.

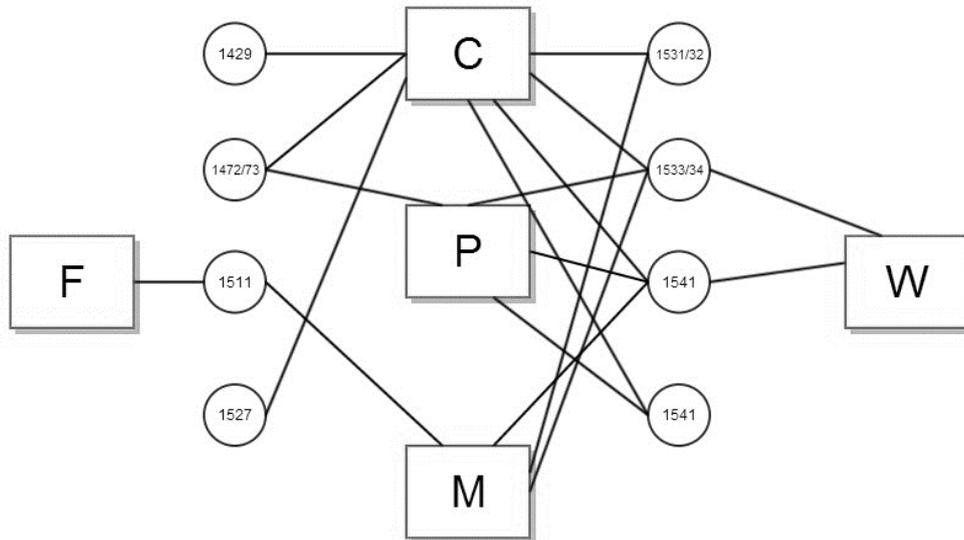


Figure B.7.5 – Graph of Brechin¹³

The descriptions shown in Figure B.7.5 of Brechin cover a period of 112 years, which opened a wide range of possibility for changing the characteristics of the property. Interestingly, all but one document description (in 1511 when it was termed a fortalice) used the term *castle*, from 1429 to 1541. Between 1533 and 1541 some woodland was named, but the 1541 description only mentioned the castle and the fishing. The mill had been fairly consistently mentioned since 1511 (besides 1527) suggesting the last 1541 description to have been limited. However, as the 1429 and the 1527 descriptions referred only to the castle, this might be an indication that the term castle implied fishing, mill, and woodland rights.

¹³ RMS, *vol ii*, no. 27, no. 228, no. 277; RMS, *vol iii*, no. 115, no. 250, no. 530, no. 579.

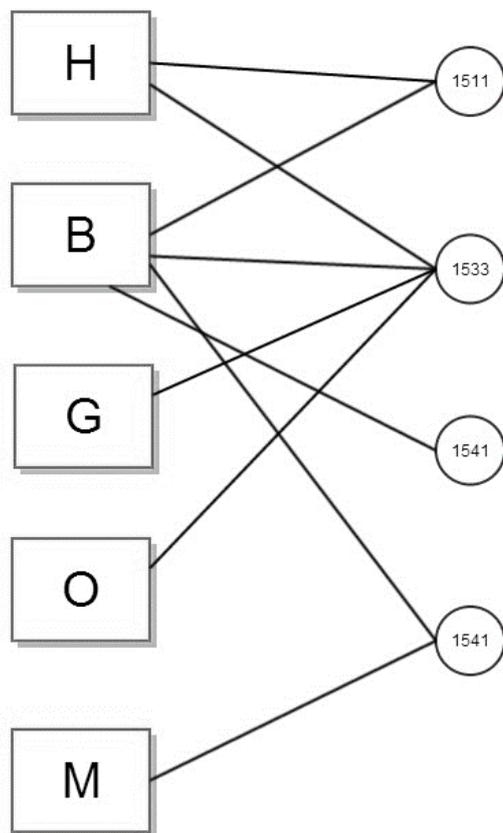


Figure B.7.6 – Graph of Downie¹⁴

The documentary descriptions of Downie shown in Figure B.7.6 span a period of 40 years, which was a reasonable amount of time for some change to have occurred. The greatest consistency with these accounts was in the description of the property as a manor-house. Each document was qualified with other descriptions differently, except the first 1541 description, which had no other label than being a manor-house. In 1511 Downie was described as a messuage with a manor-house and in 1533 a garden and orchard were added to the details. This might indicate a change in the property between 1511 and 1533, or that more was implied with the term *messuage*. The later 1541 description was limited to a manor-house with a mill, possibly showing another change to the property.

¹⁴ RMS, *vol ii*, no. 3655, RMS, *vol iii*, no. 1327; GD45/16/1960-2014.

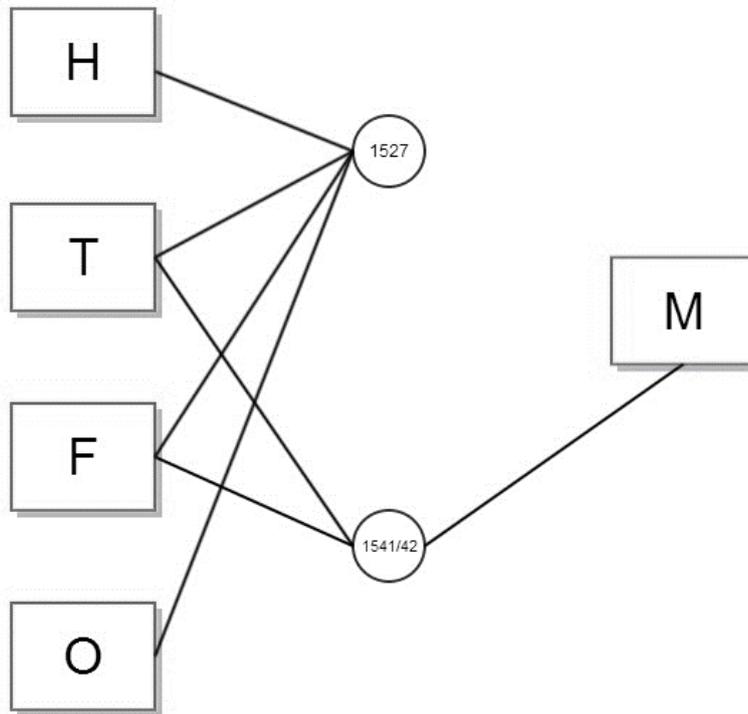


Figure B.7.7 – Dudhope¹⁵

Figure B.7.7 demonstrates only slight changes in the description of the property of Dudhope between 1527 and 1541/42. Initially the property was described as a messuage with a tower, fortalice and orchard. It was consistently termed a tower and fortalice in 1541/42 and a mill was added, though no other descriptors were used and it seems unlikely that the orchard would have been removed.

¹⁵ RMS, *vol iii*, no. 407, no. 2608.

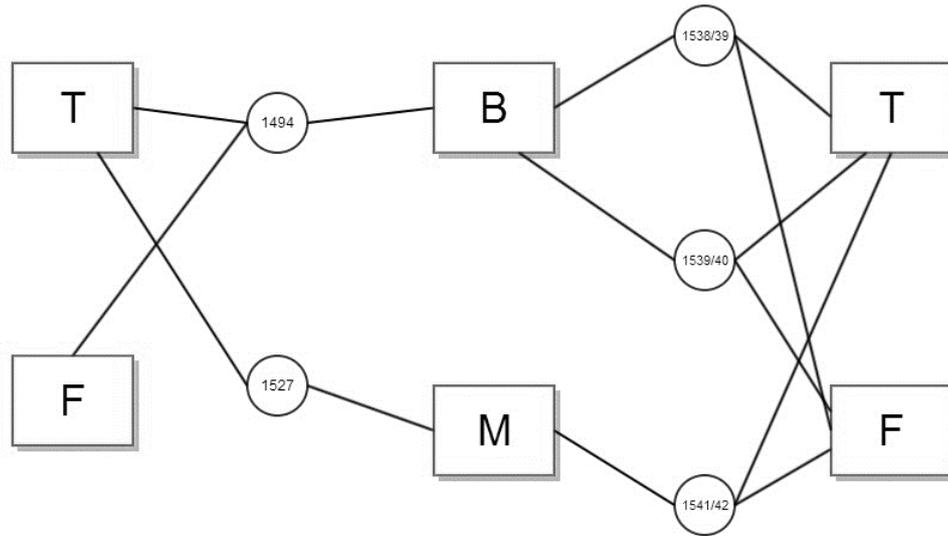


Figure B.7.8 – Graph of Easter-Denoan¹⁶

The documentary descriptions of Easter-Denoan listed in Figure B.7.8 give a 48-year spread, which suggested a reasonable time frame for changes to the property. The greatest consistency occurred with its description as having a tower and all but the 1527 document described the property as also including a fortalice. Through 1539/40 (except for the 1527 description) the description of the property also included a manor-house. Interestingly, the mill was only mentioned in 1527 and 1541/42 where the tower was the only other consistent descriptor. As the mill appeared in 1527 and the fortalice between 1538 and 1542, it has been assumed that there was a consistency of features, despite the gap.

¹⁶ RMS, *vol ii*, no. 2218; RMS, *vol iii*, no. 464, no. 1680, no. 1907; no. 2063.

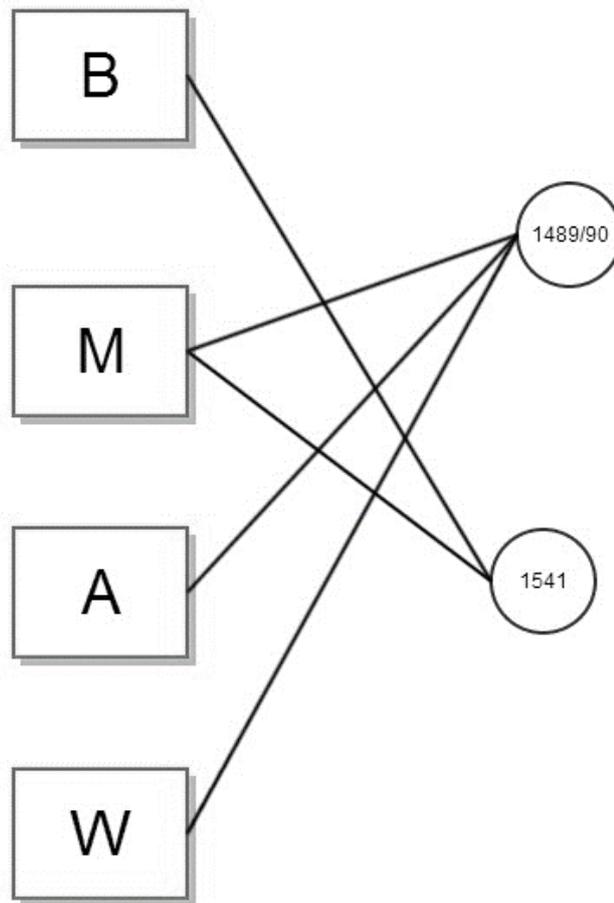


Figure B.7.9 – Graph of Inverarity¹⁷

Figure B.7.9 represents the changes of Inverarity over 52 years. There was an interesting shift between the earlier description only containing details of a mill, park, and woodland, but the later description simply indicating a manor-house and mill. There may be some suggestion here that the term manor-house implied the presence of other attributes such as a park and woodland.

¹⁷ RMS, *vol ii*, no. 3861; RMS, *vol iii*, no. 141.

B.7.2.c: Stage 1: Conclusions

At Auchterhouse, Baikie, Brechin, Downie, Dudhope, and Easter-Denoon, there was a significant element of consistency within the descriptions of the noble residence present on the property, whether that was castle, manor-house, or tower. Changes of the description occurred when referring to attribute features being described either at a different time or a different attribute. Fluctuations of the description also occurred when referring to if or how the property was described as a whole entity, such as with message or place, or divided into multiple parts. In most cases, even if a feature was not mentioned in a later document, it was assumed to be present. For example, it is unlikely that a site was without a mill for a period of time when there appears to be a documentary gap for mentioning it. Likewise, major features such as woodland are likely to have still been present even if the later documents refrain from mentioning their presence. There is some indication at Brechin and Bonnyton that the structural term “castle” might be connected to woodland. However, as Bonnyton has a tower and fortalice, and there is also a woodland with Inverarity’s manor-house descriptor, it might be that ‘barony’ implies a connection to woodland resources and that this connection is not specific to any structural term. By and large, there were no major patterns within the descriptions of these properties.

B.7.3.a: Stage 2: Identifying Trends in Attribute Usage Over Time

For the second stage of analysis the data have been arranged by nodes defined similarly to that in the first stage: one layer being nodes denoting the year in which a descriptive document was written, shown in the round nodes, and another being that of the descriptive terms themselves shown in the quadrilateral nodes. Again, links have been drawn only when a specific descriptor was used within that year. Unlike the previous stage, each year included in the first layer of nodes may contain descriptive information from a variety of sites within the study. Instead of repeating descriptors found in multiple documents of varying sites within the same year, each descriptor was only linked once whether it occurred, for example, five times or once within that year. Although adding each use would work to solidify further the central nodes, the purpose was to highlight a change over time rather than frequency of use. For ease of viewing, the dataset was drawn in two separate diagrams, the first (Figure B.7.10) nearly covering 100 years starting at 1429 and ending in 1527 and the second (Figure B.7.11) beginning in 1528 and ending in 1542. Table B.7.1 has been repeated here as Table B.7.1.b. for the convenience of interpreting figures B.7.10 and B.7.11.

The driving question for this particular stage of assessment was to determine if there were any significant changes in the descriptors being used over time. These could potentially be specific to the terminology of the main structure of the noble residence or the type of attribute features being discussed. This question primarily came out of the lack of consistency of terms used at any site at any time noted within the data,

particularly in relation to the terms manor-house, mansion, tower, fortalice, and castle. In some cases, the terms appeared to be interchangeable and this query set out to determine if there was any tendency to use one term over another at different times in Angus. In relation to the terms used to describe the attribute features, the focus is to determine whether the detail of these features became more regular at a certain point of time, delineating when these details were perhaps being assumed under an umbrella term and when their notation became important. These questions were specifically designed to further the understanding of what attribute features might have been implied with the mention of certain types of noble residence, and hopefully provide an understanding of how the non-royal nobles were shaping the space in which they lived. Although Chapter Four established that the later mention of an attribute feature does not necessarily mean the new creation of that feature, it does suggest that its legal importance was being stressed. Due to the fact that the data in this study relies heavily on these documentary descriptions it is highly important to understand reasons behind the mention of specific terms and what trends, whether legal or cultural, they might have been following at the time. There may be some differences in the attribute terms used by locally produced charters to those produced by the central royal office. However, there is no difference apparent within the context of this data, and a further expansion of the charters across Scotland is needed to explore this possible delineation further.

B.7.3.b: Stage 2: Discussion

The most obvious pattern revealed by these diagrams was that over the course of the years addressed in this project, the terms *castle*, *tower*, *fortalice*, *manor-house*, *mill* and *fishings* were consistently used. Although the term *tower* appeared in 1494, this was by no means the earliest use of this term in Angus, rather this was the first usage of the term for the properties discussed by this project and within the chronological parameters of the thesis. Over the entire time span shown in both diagrams, castle, manor-house, and mill were the most common descriptors within the dataset.

Table B.7.1.b: Descriptor Codes Used in Graphs

Code	Descriptor
C	Castle
T	Tower
F	Fortalice
M	Mill
P	Fishing
G	Garden
W	Woodland
S	Forest
A	Park
O	Orchard
B	Manor-house
D	Mansion
E	Chapel
L	Loch
H	Messuage
I	Place

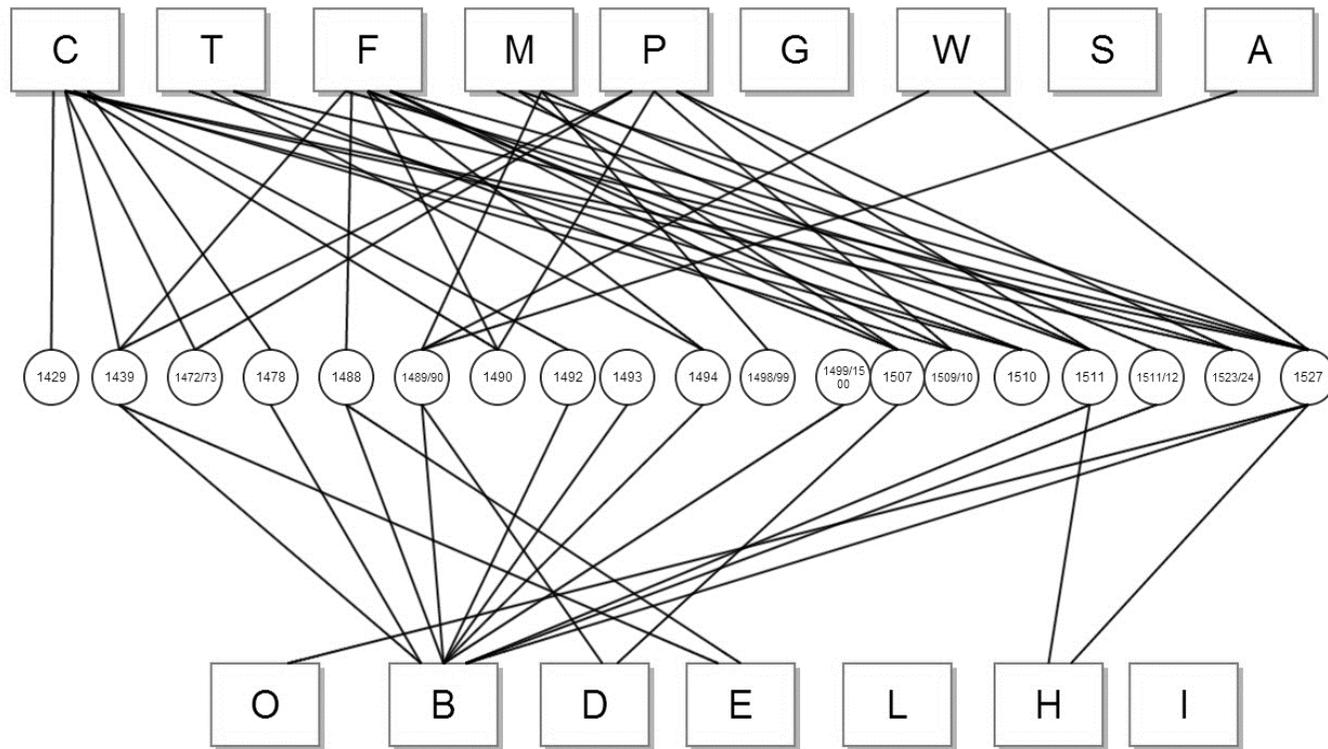


Figure B.7.10: Graph of Attribute Usage in Angus between 1429 and 1527

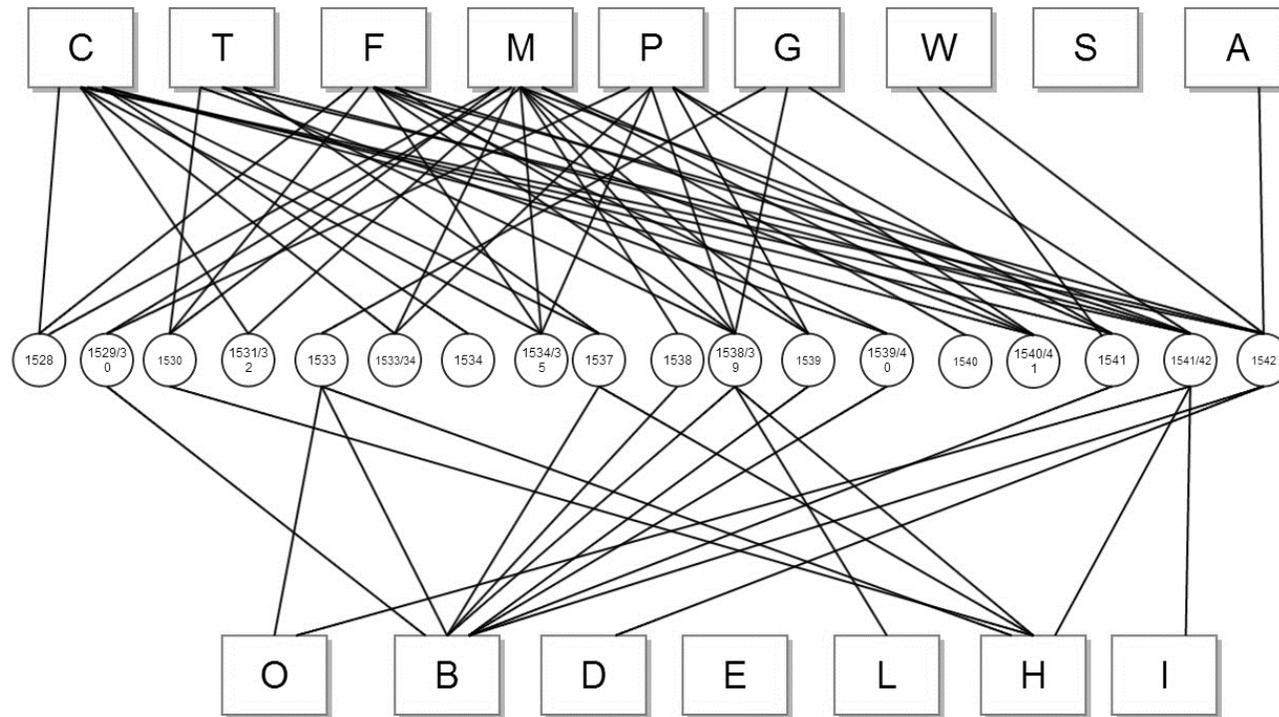


Figure B.7.11: Graph of Attribute Usage in Angus between 1528 and 1542

Mansions were certainly a less common descriptor of a noble residence within this dataset, distinctly appearing as a descriptor from 1489 onwards. Again, this study is not meant to suggest that this was the first mention of a mansion in Angus, but rather that from this dataset it appears to be a term used in the latter half of the time-period studied. However, the descriptor *mansion* was not used commonly enough to indicate any kind of trend towards a change in terminology for the noble residences under question.

Another interesting pattern that appears within both Figure B.7.10 and B.7.11 was the reference to any of the properties as a message or place. Within this dataset, message appeared in 1511 and continued fairly consistently through to 1541/42, when place also occurs. This consistency is particularly interesting as the term is generally associated with more archaic uses describing the land a lord held and his dwelling, as was outlined in Chapter Four. Its use by no means suggests that the meaning has changed in any way to include or exclude any detail. Therefore the legal implication of the term must have held through to a later date of use.

Finally, there was a distinct emergence of a pattern relating to the use of descriptions of the more aesthetic (rather than productive) features within this time scale. As stated earlier, for the productive attribute features, the mills and fishings, the use of their terms was consistent throughout this study; however, the attributes that are generally assumed to have an aspect of aesthetic appeal, though being no less productive in nature, appear much later in the descriptions (the earliest being a park and woodland mentioned in 1489). An orchard was mentioned in 1527 and this

feature remained in relatively consistent use from that point on. Similarly, gardens first appeared in 1533 but remained a presence of only limited consistency.

B.7.3.c: Stage 2: Conclusions

There seemed to be little change in the usage of terms like *castle*, *tower*, *fortalice*, *manor-house*, *fishing* and *mill* within the timeframe indicated by Figure B.7.10 and Figure B.7.11. Though there might have been some slight changes in the way each property was described as discussed in stage 1 of this chapter, there were no shifts in the overall use of the terms. The later addition of the term *mansion* within these diagrams might suggest that there was a need to slightly differentiate the legal or architectural nature of some of the properties. Interestingly, McKean only uses *mansion* to discuss buildings dating from c. 1568 onwards.¹⁸ Although McKean uses this term to address a new architectural form, insufficient evidence exists within this dataset to indicate that *mansion* replaced a descriptive term; similarly, there is a need for further evidence to support the idea of the creation of an entirely new structure within the purview of expected noble residences during this timeframe. Broadening the time scale and the region of study holds the possibility of revealing further evidence concerning the use of the term *mansion* in late medieval Scotland. Also, the tendency for using both the term *messuage* and terms for more aesthetic attributes in the later years of the period under investigation in the current study suggests that there existed a legal need to define what was contained within a mentioned property in more detailed terms. In turn, this use might imply a further level of defined rights

¹⁸ C. McKean, 'A Scottish Problem with Castles', *Historical Research*, 79 (2006), pp. 166-198; C. McKean, *The Scottish Chateau: The Country House of Renaissance Scotland* (Stroud, 2001).

pertaining to these features. Nevertheless, it is only through these later descriptions that any connection to what features might have been in the earlier landscape might be determined.

B.7.4.a: Stage 3: The Relationship Between Structural Terms and Landscape Feature Terms

This third stage focuses on determining if there were any distinct relationships between specific terms for the main structure of the noble residence and the attribute features mentioned, that is if there was any trend between descriptions of specific landscape features, whether on the more productive or aesthetic side, and the terms castle, tower, fortalice, manor-house, or mansion. Any trends that might have been present would be extremely relevant to identifying any distinct differences within the landscape corresponding to each category of noble residence. At this point, the understood relationship between the non-royal nobility and the built landscape is vague at best and any differences between the various types of noble residence were probably subtle nuances rather than great physical distinctions. When looking at the data from this perspective, it is extremely important to remember that although this project highlights castle, tower, fortalice, manor-house, and mansion as distinct and separate terms to potentially describe a different type of structure these terms were rarely found alone in the document and were often found in conjunction with each other when the same property was described. As specified in Chapter Four each term could reference different features within the same complex or represent different powers granted to the owner of the property. Subsequently, the potential for

interchangeability within the documentary evidence was great. Nevertheless, most of the descriptions varied on all levels, whether referring to the main structure or the attribute features, so the possibility that there are some distinct associations between those terms is still open. If there was a relationship between the types of attributes according to the terms of the primary structure this would be made clear by representing the data in a graph where each relationship could be clearly defined.

In order to determine if any relationships existed within the documents between the terms used for the main structural symbols of power and the attribute features a bi-modal graph was drawn. The primary set of nodes, drawn as circles, were defined as times when the terms castle, tower, fortalice, manor-house, and mansion were used in the description of a noble property in Angus. The secondary set of nodes, drawn as quadrangles, were defined as indications within the documents when mills, fishings, gardens, woodland, parks, orchards, messuages, and lakes were mentioned.¹⁹ Links between these two sets of nodes were created when an attribute feature appeared in the same document description as the main structural term. Regardless of how often these relationships occurred within the document set these links were only drawn once in Figure B.7.12. Although noting the repeated occurrences of these relationships would have demonstrated rather cemented relationships between certain nodes, the consistently strong relationship between any of these residence types and the mills and fishings was already demonstrated in stage

¹⁹ The importance of the loch is of course in the position of the noble residence of Baikie within the lake. It does remain the only mention of any natural feature aside from rivers within these noble landscapes that has been described in the documents and as shown in chapter four will have had both a productive and aesthetic function as a feature within the noble landscape.

1 and stage 2 of this chapter. It was the aim of this section to identify if there were any patterns that existed with the mill and fishings along with the other attributes.

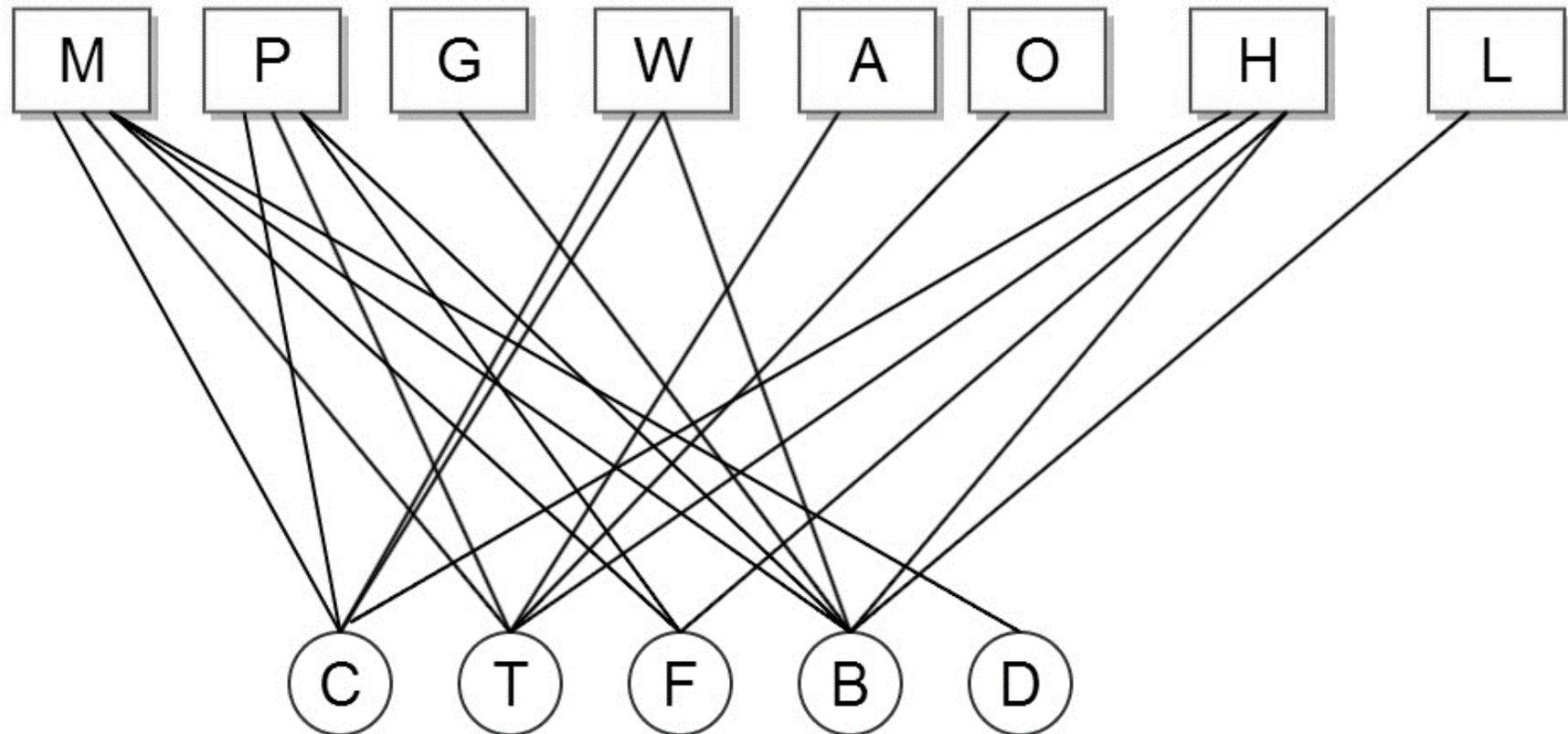


Figure B.7.12: Graph of the Relations Between Structural Terms and Landscape Feature Terms

B.7.4.b: Stage 3: Discussion

Not surprisingly, all of the primary nodes drawn in Figure B.7.12 were connected to the mill, but the mansion was the only structural descriptor that was not also linked to fishings. In fact, the mansion was the least connected of the structural descriptors to any of the attribute feature descriptors. The mansion was used more regularly with other structural descriptors as was shown in Stage 2, particularly the manor-house. The fact that the one attribute descriptor to which it was connected was the mill follows with the continually shown importance of the mill. Along with the term *mansion*, the term *fortalice* was also usually used in conjunction with several other terms for describing the main structural features of a noble's property; however, *fortalice* was much more commonly used, especially in relation to the terms *castle* and *tower*. The descriptor of *fortalice* was most strongly connected to mills, fishings and message. If *fortalice* is a term describing the enclosed nature of a noble residence, then its common use in conjunction with the mills, fishings, and message increases the strength of this term in connection to the broader landscape features within this dataset.

The terms *manor-house*, *tower* and *castle* were the most connected to attribute feature descriptors. Of these, *castle* was the least present in conjunction with attribute descriptors. Interestingly, *castle* moves beyond the attributes of mill, fishings and message and had an established connection with woodland. Similarly, the term *tower* was connected beyond the three most common attribute features to the descriptors of park and orchard to which it appears nearly exclusive. The term *manor-house* remains the term with the greatest relationship to the other attribute

feature terms. These connections expand to include garden, woodland and the mention of an extremely valuable natural feature within the landscape – loch. It is evident that the use of terms for attribute features aside from mills and fishings was distinctly rare, as is seen in Stage 2, though it is interesting to note that most of the main structural features have a relationship with the term *messuage*. The connection of the term *manor-house* with a broader range of landscape features might indicate that the term was identified with an economic complex rather than solely referring to the main architectural feature of the estate.

B.7.4.c: Stage 3: Conclusions

There appears to be very little exclusivity between the terms used for the main structural features and which attribute features might have been clearly associated with that particular category. Interestingly, the terms that were least likely to be found without the company of other structural descriptors, mansion and fortalice, are the least connected to the use of attribute features. This connection might suggest that their presence qualified as having the appropriate associated features, or that this weight was placed on the other descriptors. This link seems especially likely when the main structural feature was associated with the term *messuage*, which has the legal implication of a broader landscape surrounding the main dwelling or structure signifying power and authority. The fact that the term *manor-house* was the most connected main structural term to attribute features suggests that the term itself might not be typically associated, or legally associated, with many of the attribute features. But, as there seems to be very little distinction of one particular term used

with other attribute features, there can be no reasonable assumption that any of these terms for main structural features are associated with one or another. This use was likely due to the nature of many of the terms being used within the same description of the property. Therefore, it was reasonable to assume that most of the attribute features listed were commonly associated with the terms used for the main structural features during this period of study.

B.7.5.a: Stage 4: Connections Between Noble Families and Attributes

This final stage of assessment is centred around mapping out the connections between the land-holding noble families within Angus and structural features on their lands. It is important because it establishes specific social links between the major houses of Angus that may have influenced the physical construction of these sites. Consequently, this stage was designed to determine if there were any patterns between familial connection and terms used to describe a site and attribute features. By addressing familial connections, this stage demonstrates any properties or families that were specifically strong influences on the rest of the sites within Angus. Although there would have been a certain amount of social interaction between these sites within a more everyday context, there are two ways that specific links between members of these households can be drawn. First, as demonstrated by the work of Grant, the witness lists for charters made at a particular location for a certain noble suggests what might have been the key people in a high-ranking man's retinue.²⁰ However, as very few charters were found that mentioned the location of the sites in

²⁰S. Grant, 'Franchises North of the Border: Baronies and Regalities in Medieval Scotland' (2008), <http://eprints.lancs.ac.uk/633/1/Grant_Franchises.pdf> . [Accessed 7 May 2011]

this study, this method was not used.²¹ Second, social links were clearly established through marriage between the different families, creating a web of influence on custom and expectation of the function and style of the built environment of the noble residences. For this study, links between the marriages of noble families have been drawn to focus on one element of social connection between these sites, though it was understood that this was not the only influential connection and is one of many possibilities.

There were two different graphs drawn for this stage of assessment. The first aimed to identify with which properties each family was connected, based on the families who owned them, and any marriage connections. The first set of nodes was drawn to indicate some of the properties of this study. These were drawn as circles. The second set of nodes, drawn as quadrangles, represents some of the noble families that owned these properties. Links between the sets of nodes were drawn when a member of one family was either connected to a property based on main ownership or if they married a person connected to a property. Figure B.7.13 shows relationships that were both directly connected to the property in question and those that would feature in a broader social circle of ‘in-laws.’ The second step in this assessment takes the familial connections to the properties from step one in Figure B.7.13 and transfers the connection to a property to that of the associated descriptors. Therefore, the first set of nodes in Figure B.7.14 were the family names associated with land holding in Angus, drawn as quadrangles, and the second set, drawn as hexagons, were defined by the descriptor terms of the properties identified in step one of this stage. Links

²¹ The fact that few charters were made or survive from these smaller houses implies that these charters were more likely to be drawn up in more major centres of administration.

have been drawn between the nodes when a family name was connected to a property with a specific descriptor, for properties where this can be clearly identified. In other words, when a link was formed in Figure B.7.13 to a property, a link was also formed in Figure B.7.14 to each of that property's associated descriptors. This stage fully demonstrates which families were connected to which descriptors and features types within this dataset, highlighting any social patterns that might exist. It is important to note that any patterns suggested through this method of analysis were limited by what was present within the dataset; this highlights areas for potential future research.

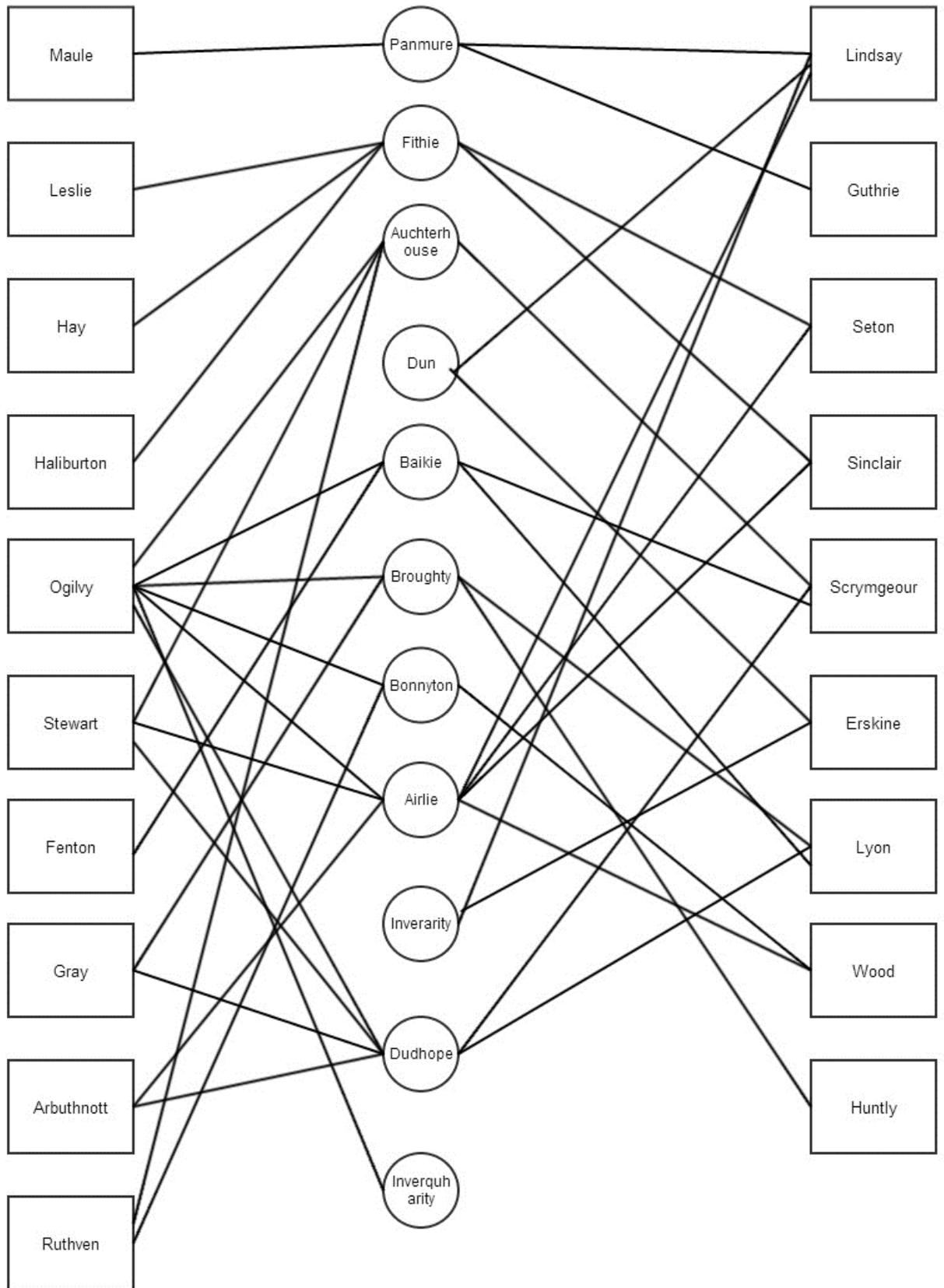


Figure B.7.13: Graph of Familial Links to Properties

B.7.5.b: Stage 4: Discussion

There were two main types of patterns that could be described from Figure B.7.13. The first focuses on what sites appear to be the most connected to the family nodes. The second looks at what families are the most connected to the various sites. Each of these focuses on different social centre options within this network both of which were particularly valuable points of reference as key influences into the creation of the built environment.

From the first perspective, two main properties were the most socially connected to other properties: Dudhope and Airlie. Further from this, both of these sites were connected to fairly prestigious families at the time. Dudhope to the Lyons, Ogilvies, and Scrymgeours, and Airlie to the Lindsays, Stewarts, and Ogilvies. Fithie ranked second as a connected site, having links to Leslies, Hays, Setons, Sinclairs, and Haliburtons. Broughty and Baikie were both connected to the Lyons and Ogilvies, with Huntlies and Grays and Scrymgeours and Fentons added. It was therefore, possible that these sites were at the centre, both being highly influential and greatly influenced by other sites.

Looking at the families as the main nodes, the Ogilvies were by far the most connected to noble properties within Angus, and subsequently to other families. There was a significant distinction between the Ogilvies and the other families, making this node central to the network. As primary network connections, the Ogilvies were linked to Auchterhouse, Baikie, Broughty, Bonnyton, Airlie,

Dudhope, and Inverquhar. Subsequently, they were secondarily linked to other families such as the Stewarts, Ruthvens, Scrymgeours, Lyons, Fentons, Grays, Huntlies, and Arbuthnots, making their potential range of influence (whether given or gained) very large. After the Oglivies, the Stewarts, Lyons, Lindsays, and Scrymgeours all rate second with three primary network connections. Through their secondary connections, however, the Stewarts, Scrymgeours, and Lyons all had a much wider range of influence. Through the secondary connections, there were very few families who were not largely connected to the rest of the network, making this network a ‘small world’.²² Given the nature of medieval noble society this was not surprising, but having this information visualised as a network assists in demonstrating the complexity of this medieval noble society and the raised potential of influencing each nobles’ built environments accordingly.

Figure B.7.14 demonstrates the following:

- Auchterhouse was linked to the Scrymgeours, Oglivies, Stewarts, and Ruthvens. This link subsequently connected the Scrymgeours, Oglivies, Stewarts and Ruthvens to the following attributes: manor-house, castle, fortalice, and mill.
- Baikie was linked to the Scrymgeours, Lyons, Oglivies, and Fentons. This link subsequently linked the Scrymgeours, Lyons, Oglivies, and Fentons to the following attributes: fortalice, manor-house, mill, messuage, loch, garden, and chapel.
- Bonnyton was connected to the Oglivies, Woods, and Ruthvens. This connection subsequently linked the Oglivies, Woods, and Ruthvens to the

²²D. Watt, *Small Worlds: The Dynamics of Networks Order and Randomness* (Princeton, 1999), p. 11.

following attributes: castle, tower, fortalice, mill, fishings, woodland, and park.

- Dudhope was linked to the Scrymgeours, Lyons, Ogilvies, Stewarts, Grays and Arbuthnotts. This connection subsequently linked the Scrymgeours, Lyons, Ogilvies, Stewarts, Grays and Arbuthnotts to the following attributes: tower, fortalice, message, orchard, and mill.
- Inverarity was linked to the Erskines and the Lindsays. This connection subsequently linked the Erskines and Lindsays to the following attributes: manor-house, mill, park, and woodland.
- Panmure was linked to the Maules, Lindsays, and Guthries. This connection subsequently linked the Maules, Lindsays, and Guthries to the following attributes: castle, fortalice, mill, and fishing.
- Fithie in turn was connected to the Setons, Sinclairs, Leslies, Hays, and Haliburtons. These links subsequently were connected to the following attributes: fortalice, manor-house, mill, and fishing.
- Dun was connected to the Lindsays and the Erskines. This link subsequently led to the Lindsays and the Erskines being connected to the following attributes: castle, fortalice, mill, fishing, and mansion.
- Broughty was connected to the Lyons, Huntlys, Ogilvys, and Grays. This connection subsequently linked the Lyons, Huntlys, Ogilvys, and Grays to the following attributes: castle, fortalice, fishing, and mill.
- Airlie was connected to the Ogilvys, Stewarts, Arbuthnotts, Woods, Sinclairs, Setons, and Lindsays. Subsequently, the Ogilvys, Stewarts, Arbuthnotts, Woods, Sinclairs, Setons, and Lindsays were connected to the following attributes: castle, mill, and fishing.

- Inverquharity was connected to the Ogilvys, resulting in the subsequent connection to the following attribute features: castle, fortalice, fishing, and mill.

Figure B.7.14 demonstrates how the various relationships between families and properties shown in Figure B.7.13 translate into familial relationships with different descriptors and attribute features. Again, this can be addressed from two focal perspectives, but as common connections of the features have been demonstrated in Stage 2 of this chapter this stage will only consider the relationships of the families with the various descriptors and attribute features. First, the greatly connected people in Figure B.7.13 remained the greatly connected features within the network. It was perhaps more interesting to consider how these families were associated with the more rarely mentioned attribute features. Lindsays, Erskines, Woods, and Ruthvens, were all connected to the mention of woodland. Stewarts, Lyons, Grays, and Arbuthnotts were all associated with the description of orchards. Gardynes were connected to Ogilvies, Fentons, Scrymgeours, and Lyons. Parks, on the other hand were linked to Lindsays, Erskines, Woods, and Ruthvens. There was perhaps some interesting connection between the repeated list of familial connections between woodland and parks. It was also interesting that the term *tower* was not connected to Lindsays, Maules, Leslies, or Hays. For the most part, though, the connections between these families and these features provides some identified sites where further research might be done to seek out potential archaeological evidence for landscape features like orchards, gardens, woodland, and parks.

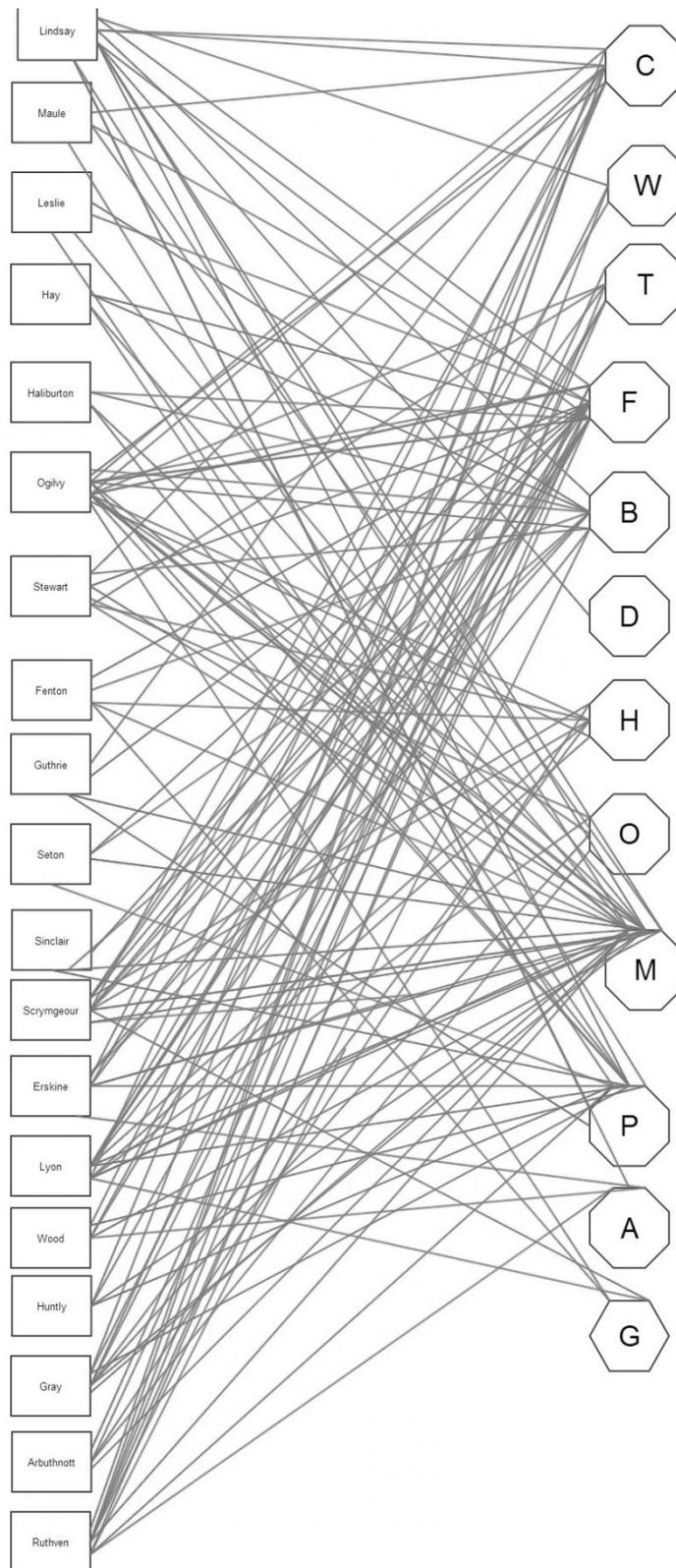


Figure B.7.14: Graph of Familial Links to Attributes

B.7.5.c: Stage 4: Conclusions

Figure B.7.13 helped to identify two major points for further researching social trends within the construction of noble architecture and the surrounding environment. From a site perspective, Airlie and Dudhope were the most connected structures, ready centres for influencing style and custom. By looking at the families the central position of the Ogilvies was clear; however, it was through looking at the secondary connections of these families that light was shed on the complexity of these relationships. Therefore, the potential for any stylistic expectation or development of social custom is great. The fact that most of the families were connected with two degrees of each other makes this network a 'small world', which in turn ensures that identifying specific points of impact on style or custom was nearly impossible. An equally interesting aspect can be noted in Figure B.7.14: the families connected to the rarely mentioned attribute features. If there was any merit in the possible exchange of ideas for making up the landscape of the noble residences, the familial connections to these attribute features might suggest other properties where these features existed, though no documentary or physical evidence is currently known. This information may prove invaluable for further investigating the connected sites for evidence of these attribute features.

B.7.6: Chapter 7: Conclusion

As pointed out earlier, network analysis within an archaeological or historical context is extremely useful as a tool to represent previously existing relational connections which modern scholars seek to recreate. In this way network analysis is most useful as an experimental tool and a method for attempting to gain further insight to particular questions about the relationship between human interaction with space and objects around them. This section has trialled network analysis on the dataset of terms used to describe the sites of noble residences created for this project. As with any experimental method, there were many challenges relating to the use of the data, though several interesting features came out of this form of assessment.

The first stage of this assessment looked at the sites on an individual basis. A bi-modal graph was created representing both the document and the descriptors. Links were formed when a document contained a descriptor. This procedure was mainly done to determine if there were any patterns within the descriptions of the individual sites. These patterns form the foundation for the rest of the networks, which might be relevant to identifying a contemporary assumption of what attribute features were associated with what particular noble residence type. Due to the nature of each property the only relevant pattern appeared to be a change when aesthetic attributes were mentioned.

The second stage of this assessment addressed the question of any direct patterns in the description of these properties over time. The nodes were divided similarly to stage one, though each document was added into the graph based on year. Links were drawn when a document written in that year contained the descriptor. There was no major change in the use of terms such as *castle*, *tower*, *fortalice*, *manor-house*, *fishings*, and *mills* over this timeframe. It was noticeable that terms such as *message*, *garden*, *orchard*, *woodland*, and *park* only tended to be added in the later years of the timeframe, suggesting a later need for these features to be legally recognised, or an addition (or expansion) of these features within the properties.

Stage 3 compiled the data to see if there was any distinct pattern between the terms for the noble residential types and the attribute features mentioned. For this stage a bi-modal graph was drawn with each noble residence type as one type of node and the attribute features as another. Due to the tendency for most of these noble residential descriptors to appear in a list in the same document, there was very little distinction between the resident type and the attribute features. Saying that, the term *manor-house* was the most connected to both the other residential terms and the attribute features. This connection suggests that the description of an economic resource might be linked to a legal need for expanding the description when manor-house was used.

The fourth stage of this chapter places these sites into the context of the social network of the late fifteenth and early sixteenth centuries. Based on marriages between the main families two graphs were drawn to demonstrate the connection

between the noble families and the noble residences in question. The first graph was defined by the family names and the names of the noble residences. Links were made when a family connected with one property married to a family connected to another residence. In this way it was possible to demonstrate which noble residences were most connected to networks of noble families (Dudhope and Airlie), and which family was connected to the greater number of noble residences (the Ogilvies). Consequently, the secondary connections of these families result in a greatly connected network, meaning the potential for influence between families and sites was relatively high for all involved. The second graph was created to associate the families with the descriptive terms used at the associated properties. One set of nodes remained the family names while the second re-listed the descriptors used in the documents. There was an interesting trend in families that were connected to attribute features, suggesting a possibility for shared implementation of these attributes. This draws attention to sites where further research is merited for investigating the presence of these attribute features.

Overall, the relationships between the sites and their descriptors provided very little evidence for distinctive patterns. It did, however, indicate that these attributes were more generally spread over the terms used to identify noble residences. The relationships between the sites and the people involved with them visualised in a graph was particularly helpful in identifying properties and people that were influential to this network and likewise the places that might have been influenced. Not only has the application of network analysis to this dataset contributed to our understanding of the links between properties, the social context, and the landscape features, but it adds to the growing discussion of the uses, benefits, and problems of

applying network analysis to historical datasets. The application of this method to a broader dataset of descriptive property terms and people of the entire nation of Scotland is likely to demonstrate more distinct patterns and trends.

Chapter 8: Conclusion

In an attempt to further our understanding of the landscapes surrounding noble residences in medieval Scotland and to expand the dialogue addressing how the arrangement of the surroundings of noble residences affected interactions within their complexes, this project has focused on creating a catalogue of attribute features of noble residences within the sheriffdom of Angus and run three experimental assessments to address interaction between the noble residences and these features. Not only was this intended to supplement academics' knowledge base of historical landscapes, many of which are contained within the Historical Environmental Record (HER) of the county, but also to extend castle studies' widely accepted focus on space and spatial interaction within the interior of medieval noble residences to include the wider complex of landscape and attribute features. In this way, the project provides information about everyday life in places near noble residences in late medieval Scotland, and how the physical layout of these features would have both promoted and restricted human interaction. The original parameters set for this study included the late medieval sheriffdom of Angus in order to include a variety of Scottish geographical qualities ranging from high-mountain grazing to coastal landscapes. Additionally, the project focuses on the period between 1449 and 1542 to capture a time frame that includes both structural and documentary remains. This project's findings have been divided into two sections: Section A discusses the creation of the dataset of sites and the attribute features through three different source types (geographical, archaeological, and documentary), while Section B discusses the results of three testing models which were used to assess interaction

between the noble residence and the attribute features within this dataset (RA assessment, Gravity Model, and Network Analysis).

Using geographical sources to compile this dataset was essential for understanding the basic landscape in which these noble residences were set as well as providing a clear method for establishing a location for the noble residences and their attributes, a category on which any GIS hinges. No contemporary maps with extensive details concerning the noble landscapes were found, but the Timothy Pont maps drawn in the late sixteenth century provided a wealth of information pertaining to the rural landscape. This source was not drawn to any scale a modern eye would recognise, but it does provide an interpretation of location and place focused on major water courses or other structures relevant to sixteenth century society. Pont included many symbolic features in his maps, including mills, woodland, rivers, and structures, and it was through these symbolic structures that a greater understanding of the noble landscape can be gained. Later maps such as Roy's military maps, Ainslie's survey, and the first edition of the Ordnance Survey were used to establish the continuity of a landscape feature to a time period where the location could be measured through modern coordinates. Through this, a location category was established for many of the features within this data, building a dataset that can be drawn within GIS.

One of the benefits of using many years of geographical data for this project was that this data helped demonstrate the vast changes which occurred within the natural landscape, particularly the major draining of wetlands. Due to this, many of the wetland features that would have been major features for everyday medieval life are

no longer present within the landscape and many of the smaller streams have been straightened into canals adjusted for the current agricultural landscape. Moving from the late sixteenth century to current surveys has allowed this project to identify the locations of water courses or wetlands that are no longer present within this landscape. For example, the loch on which Baikie Castle sat has been drained since the eighteenth century and the moss around Resteheth Abbey between Forfar and Finavon has also been drained.

Furthermore, using this wide range of maps has specifically located many of the attribute features, particularly mills, which allow for the creation of a physical representation of their location within a modern geographical context. Due to the use of water power to operate these mills, it was unlikely that mill-ponds and lades were moved far from that spot once they were created. If they had been moved, it was likely they were still within the same general area. Although the structural evidence for any contemporary mills for this study has been lost, the later locations of the mills were used to identify the late medieval mill sites. In this way, even maps from the nineteenth century help identify the location of these attribute features. Similarly, maps of modern fishing-beats belonging to these estates provided a good indication of the location of likely places where physical fishing would have taken place. Though some changes in the river were most likely inevitable, the current fishing pools are likely to be in a nearby locale.

Archaeological data on the structures of the main noble residences provide a focal point around which the site system is focused. Little archaeological evidence is

available for the fishings and the mills which were the primary attribute features studied in this project, and any evidence of the gardens, orchards, woodlands, or other attribute features would require extensive archaeological surveying and digs. Most of the mill sites were presumed as being on, or at least in close proximity to, later mill sites, though nothing of the late medieval mill sites remains evident. Likewise, evidence for the medieval fishings within the area was scarce. Outside the walls of Brechin there was an eighteenth-century estate plan indicating the location of fishing weirs within the river, of which the locations can still be identified. Though the technology had changed in later years, it is likely they were placed in a similar location in earlier times.

There are a few structures that actually retain discernible evidence of the late fifteenth- and sixteenth- century structure. Many of the noble residences had been entirely rebuilt in the late sixteenth- and the seventeenth- centuries, leaving little from earlier phases of construction behind. Other sites were abandoned in later years, left to dereliction and often robbed for building other structures within the area. In some cases, the bases of the walls were still visible enough in the eighteenth and nineteenth century when Warden and Jervise identified them, and so the general location of the site is known, though no indication of the structural make-up can be interpreted. In many cases there are no surviving foundations for these buildings at this point, or whatever surviving foundation was robbed as late as the eighteenth century, so any aerial survey or further excavation might not reveal the outline of the structure's form. Other cases, such as Aldbar, were demolished in the twentieth century. Furthermore, many of these sites are privately owned and, like Melgund and Inverquhar, have been renovated for modern inhabitants. Renovation projects have

provided some archaeological information on the layout, though no major findings were found at these sites during the modern construction process. Subsequently, the architectural surveys of MacGibbon and Ross provide a significant amount of information about the structural layout of these properties. Likewise, W. D. Simpson surveyed many of these buildings in the early and mid-twentieth century. From these surveys it was possible to determine some of the internal arrangements of the structure's public and private spaces, particularly pertaining to the hall size, which, as pointed out by Gillian Eadie, has the potential for providing an indication of the maximum entertaining capacity of the hall, which was used in the gravity model test. Further spatial analysis relied on the identification of some archaeological presence to establish a physical link to the noble residence for an object ID category within a GIS dataset.

Finally, contemporary documents describing the sites provided information about the properties under study and identified the attributes used to describe them. These descriptions have largely been found in charters of land created when ownership was transferred or confirmed. Subsequently, a large portion of these charters have been preserved within the Register of the Great Seal. The collection of this data has focused on two main elements: firstly, what terms were used to describe the main noble residence itself, which included a variety of terms in any combination of castle, tower, fortalice, manor-house, and mansion; and secondly, what landscape features were added to the description. Through these descriptions, it was possible to identify which attribute landscape features were most commonly mentioned as part of the property, which were the rights to fishings and mills. Unfortunately, there was little documentary mention of other features such as gardens, orchards, woodlands,

and parks. They do appear, but are rare and not necessarily connected to direct descriptions of the noble residences, rather being associated with the barony in general. This indicates a link to the right to hold property which needs to be further explored. Nevertheless, the prominence of the fishings and mills has moved to solidify the importance of these features within the noble residential environment. For this reason, the first two assessment tests focus primarily on these attribute features. Compiling this information established a set of attributes associated with each site, enabling more complex queries to be asked of the GIS dataset.

The method of assessment tested on this data in Chapter Five uses an adjusted form of Relative Asymmetry (RA) analysis to address interaction between the noble residences and attribute landscape features within the wider complex of the structure. This method has often been used to assess the interaction of the rooms within the building by transforming the actual distance between places into spaces or steps passed through for access or as a destination. These spaces are typically drawn out into a diagram and analysis based on the distance from each room to all other areas within the same system. In this way, spaces within a noble residence can be identified as being integrated or segregated from the system. It is also possible to highlight public and private space, features controlling the system or being controlled by another room, and identify key points of interaction. In Chapter Five, use of this form of assessment has been applied to the external arrangement of the noble residences' landscapes, addressing how the main structures interacted with their associated fishings and mills. This study has two scales of study: first, the sites were considered individually to see how each noble residence complex was suited for interaction and secondly, using a comparative Real Relative Asymmetry value

(RRA), each site is compared to one another in order to identify sites that are more integrated or segregated.

The first stage of RA analysis revealed interesting trends in what features within the complex were the most integrated. At Broughty, the main residence was the most integrated feature within the system. Likewise, the RA values identify the features within the complex that were the most segregated from the rest of the system. Melgund and Dun were the most segregated property feature over all, though Bonnyton's main residence was second within its system. Interestingly, the mill at Bonnyton was the most segregated. For most of the other properties, the mills and fishings featured in the centre of the value range, indicating an average level of access and interaction at these points. These values help identify features within the properties that play key roles in the interaction of the sites. The main residential structure at Broughty was situated in a way that made access to the rest of the complex easy, suggesting a more public and open structure, while Melgund's and Bonnyton's main residences restricted access between the rest of the features, making the structures more confined and private.

The RRA analysis allows for each site to be compared to any other site with different number of systems. Subsequently, for this study the sites were compared to each other, but notably almost all were, on average, moderately to highly segregated. This rating was not surprising given the distance and subsequent number of spaces involved in this system. Panmure remained the highest value within these properties, indicating that it was the most obscured property feature for accessing the other

features within its complex. Bonnyton had consistently high numbers, making it the most highly segregated property amongst those studied. Nevertheless, it is important to note that this study was constrained by the lack of identifiable features and only addresses two types of attribute features within the complex. Although this approach provides hints to certain trends in relation to access, it is clear that this method of analysis is more suitable for properties where additional attribute features might be assessed. Therefore, this method is better suited for properties in other parts of the world or for addressing situations relating to access and integration in later time periods.

The second method for exploring interaction between the noble residence and the attribute features uses a variation of the Gravity Model to assess the draw of interaction between these features. To achieve this, this section was restricted to sites where the halls of the structures were identifiable along with the sites of the mills. The size of the halls, as demonstrated by Gillian Eadie, provides a general framework for determining the maximum capacity for entertaining within the space of the hall, which gives a general idea of population size that can in turn be used to determine the attraction of interaction between the other sites. Likewise, an average weight of grain production was taken from accounts of similar properties to determine the variable which dictated the draw from the productive features side. In this way, this part of the study focused on addressing the natural amount of movement that would have occurred within the complex of these noble residences, be it that of servants, the noble household, or guests.

There were two major benefits to using this model for assessing the draw of interaction between the noble residence and the attribute features. Firstly, this assessment provides some exciting information about the capacity of some of these structures, with even the smallest having a maximum capacity of 58 persons. Even with a screen reducing the room for entertaining guests, most of these structures had a reasonable capacity for entertaining. This capacity is important because it challenges some interpretations of this period that posit that these smaller halls were much more private. Secondly, the I_{\min} and I_{\max} assessment highlighted areas where the draw for interaction increased significantly with household size. The RI values, however, reveal that Edzell and Affleck were the properties within this dataset that contained the smallest change in attraction for interaction according to household size, suggesting the least noticeable impact on the surroundings with this fluctuation. Again, this model has provided some information about the natural interactive draw within these sites; however, within this dataset, its uses were limited and it is evident that it will be more useful within a dataset where more information about the composition of the noble residence complex is known and a greater diversity of variables were possible.

Finally, in Chapter Seven the data is assessed through a variety of network analysis questions. This assessment was largely done to address the data within the catalogue without the constraints of required topographical information. Through placing the descriptions of features within noble properties into a topological framework, it was possible to visualise the relationships these terms had with the properties and search for trends explaining how they were connected. The transfer of assessment focus from topographical to topological allowed the properties or features that no longer

have a physical presence or locations that have not been identified to be assessed in this study. By this means, features such as gardens, orchards, woods and parks which were not included in the previous two test methods can be addressed by this project. The application of network analysis for this last section of analysis consisted of four stages in order to address the relationships between the documents and descriptors used over time to further assess the associations between properties, descriptors, and the families which owned them.

The first method looked at individual sites and how they were described over time, where two types of nodes were defined as descriptive terms and documents identified by their year. Links were drawn between them when a document used the descriptive terms for the property. This stage looked to specifically address any trends in the type of features being described at one property over time. The graphs from this stage were useful in demonstrating in what time period certain descriptors were associated with these properties, but no major trends were found. This absence is largely due to the lack of documentary records available, this method would most likely be more useful for properties with more surviving documents over a wider period of time.

Secondly, this project created a bi-modal graph to demonstrate any overall trends in the change in use of descriptors over time. This method uses the same nodal definitions as the first stage, though it considers all the documents in the dataset rather than just those within individual sites. Links were drawn when a document within a specific year used a descriptor. The main impetus for this stage was to

attempt to identify any trends in the use of main residence descriptors, like castle, tower, fortalice, manor-house, and mansion over time, and if there was a corresponding connection to when these terms were connected to attribute descriptors. The use of main residence terms appeared to remain consistent throughout the time period studied as did mentions of fishings and mills; however, attribute features such as gardens, orchards, woodland, and parks appeared later in the fifteenth century and became more commonly mentioned as time progressed.

The third stage of this assessment focused on identifying relevant trends, paying particular attention to terms describing main residences and attribute features mentioned concurrently. To do this, two sets of nodes were defined by the main structural descriptors of castle, tower, fortalice, manor, and mansion distinct from the other attribute feature types. Links were then drawn when a main structural term was used along with another attribute feature term. Due to the fact that many of the main structural terms featured together with several other terms within the same document, it was not surprising that no trends were found between these defined nodes.

Finally, the data were drawn into a graph that expanded the relationships to include the familial ties to the property and showed how these properties became central elements in connecting the noble society at this time. This expansion aided in efforts to visualise which families were central in influencing the style and arrangement of the structures within Angus and also which properties were the most pivotal in connecting this network and thus influencing style. To accomplish this, a bi-modal graph was drawn, where the nodes were defined as the property names and the family names. Links were drawn when members of families connected to a property

married members of families connected to other properties. As expected, the Ogilvies were the most prominent family connected to these properties, followed by the Stewarts, Lyons, Lindsays, and Scrymgeours. The most connected properties were Dudhope and Airlie, followed by Fithie, Broughty, and Baikie. The second phase of this stage involved the creation of a graph where the families were one set of nodes and the second set featured the attribute features associated with the properties they were connected to in the previous stage. This phase allowed for any identification of family and feature relationships. Woodland was connected to Lindsays, Erskins, Woods, and Ruthvens and orchards to Stewarts, Lyons, Grays, and Arbuthnots. Ogilvies, Fentons, Scrymgeours, and Lyons were connected to gardens and Lindsays, Esrkines, Woods, and Ruthvens were connected to parks. These relationships are fascinating and expanding the time frame and geographical area to include all of Scotland would no doubt produce additional noteworthy trends.

The benefit of creating a catalogue of the known attribute features around noble residences proved helpful when seeking to understand the makeup of noble residence landscapes. It will also provide valuable information for future research in the area and add to our understanding of the Historical Environmental Record and heritage landscapes. Understanding which parts of the landscape were around these structures further facilitates the interpretation of these historical structures and how they functioned within the wider complex of features. The experimental methods of assessment demonstrated in the second half of this thesis have provided some indication of the basic elements of interaction between the noble residence and the attribute features. Primarily these are that mills and fishings were very important features for these sites and the identification of sites where interaction between the

site features would have been easy or difficult. However, they simultaneously provoked more questions that are beyond the scope of this project. That said, after applying these methods, it became clear that they were better suited to a dataset that contained more specific information about the surrounding features of the noble residences and their locations. They will need to be tested within a larger dataset, and possibly within a different time frame or country context, to reach their full potential. Nevertheless, these methods of assessment have brought up many questions about the interaction between the main structure and other features at these sites which will hopefully spur further discussion and research within this area of study, particularly concerning medieval Scotland.

Through compiling data on the noble landscape in late fifteenth and early sixteenth century Angus, many details relating to noble life have been revealed. Firstly, it is very interesting to see the number of diners (and household staff needed to serve these diners) that residences were capable of handling. This calculation provided a clear indication of how great a feast could have occurred within the household of some of these lesser nobles. Certainly, large numbers could have been expected for places such as Glamis and Edzell, but the capacities of places like Inverquhar and Affleck provide a solid indication of the capacity of nobles' estates for entertaining. Secondly, this study has provided further evidence of the potential influence of families like the Lindsays, Ogilvies, and Scrymgeours; their noble estates were designed both for aesthetic and practical purposes. It is clear that a similar study done for all of Scotland will reveal some exciting trends in relation to the nature of fifteenth- and sixteenth-century Scottish entertaining and how this subsequently

might have affected the interaction with the environment and the design which encouraged and restricted it.

Not only has this study expanded what noble residential landscapes have been studied into the geography of Scotland, but it has provided a basic foundation for understanding the Scottish noble landscape rather than simply assuming similarities with England. Primarily, this study has shown the powerful connection between the noble residences and their associated mill and fishing rights. This link is not surprising, due to the extremely valuable economic resource that they provided. Furthermore, it confirms a strong connection with a water source and its associated resources. Along with this connection to water, much more attention was placed on describing the structure itself, rather than the other features associated with the property. In some cases woodland, forests, and parks have been mentioned, though these were not commonly identified. Similarly, there were some references to gardens and orchards, but these were also rare. This study has clearly identified the noble sites where specific terms were used to describe the property, though a further assessment covering all of Scotland is needed to identify what might have been the 'typical' Scottish lordly landscape.

The use of RA and RRA values in this study contributes to the discussion of interaction within a defined space and how this can be applied to a historical context. Most notably, this study's emphasis on assessing the surrounding features of the noble residence brings the discussion back to a wider settlement context, for which Hillier and Hanson had originally designed the analysis. Using RA and RRA values

to assess how the noble residences interacted with features in the surrounding landscape, the project explored the benefits and drawbacks of using this method with a dataset that has so many limitations. It is evident that further research is required either to identify more features within the dataset of this project or to identify a site with more details readily available and translatable for this method. Nevertheless, the representation of the levels of segregation exemplified in the application of RA and RRA values in Chapter Five demonstrate that there is a great benefit in continuing to explore the landscape context of noble residences through this method.

The assessment of the draw for interaction using the gravity model discussed in Chapter Six has proved to be incredibly useful in demonstrating how the noble residence and the surrounding landscape features function as places of consumption and production. This method connects resource management of the aristocratic residential complexes into the discussion of how the gravity model can reveal the strength of possible interactions. More importantly, this project brings this model into a broader field of study with complicated components. It is clear that continuing to develop the use of the gravity model within the context of the noble landscape will further our understanding of how the arrangement of the noble landscape affected the transfer and gathering of resources.

Chapter Seven brought the dataset for this project into network analysis. The use of network analysis within this study was primarily focused on the benefit of incorporating this data into network graphs, creating a clear picture of the connections between the structural terms and the landscape features used across the

timeframe of this study and the social spectrum. Although the visual representation of this information portrayed very few patterns, there is obvious potential in pursuing the assessment of the wider context of noble residences as networks on each of the micro-, meso-, and macro-scales. It is clear that expanding the data used to include a longer time period and wider geographical boundaries would allow the graphs to be developed as a visual representation of the connections and expand the data to be appropriately queried on the broader scale.

The use of documentary sources for this study has provided a sound resource for terms used to describe a noble's estate in its entirety. Within the parameters of this dataset, any description of the landscape features attached to the property was rare and limited. This scarcity brings into question whether this was common across Scotland during this time, or if the descriptions indicate a unique trend in Angus. In order for this question to be answered, further research must be undertaken to compile the use of descriptive terms used for noble residences across Scotland.

Regarding the lack of descriptions including references to features other than mills and fishings, there are still many unanswered questions relating to how the arrangement of the site of the noble residence might have encouraged or discouraged interaction between these features. However, the available evidence for Angus during the late fifteen and early sixteenth centuries does not have the necessary detail to properly address this question. To do this study within Angus, excavation work is necessary on the grounds of the sites that have been less disturbed by later development. Alternatively, it might be possible to address access in some of these

estates in a later time period, or to search out a different area altogether, perhaps within England, France or Germany.

Furthermore, this study raises many questions about the use of spatial and network analysis within historical studies. The results of the three methods explored here indicate that there would be great value in pursuing the application of these through wider historical datasets. It is particularly evident that a broader use of GIS and other technologies for the visualisation and the examination of historical data will continue to demonstrate key patterns whilst addressing spatial and social relationships. This advancement would, however, require more extensive training in these technologies or a collaborative project between history and computer science. Nevertheless, the prospects of furthering the digital representation of noble residences and their landscapes and what sort of questions can be asked from historical, archaeological, anthropological, and scientific perspectives is quite exciting.

As an exploratory project, this study has revealed many stimulating avenues for the continued research of the spatial and social interaction of noble residences and their surrounding landscape features. It has provided a basic framework from which future studies can research the noble landscapes of Angus and Scotland, the use of RA and RRA values, the gravity model, and network analysis as a method for studying history. Rather than looking at this point as the end of this study, it is perhaps more accurate to view it as the starting point and an inspiration for many years of research to come.

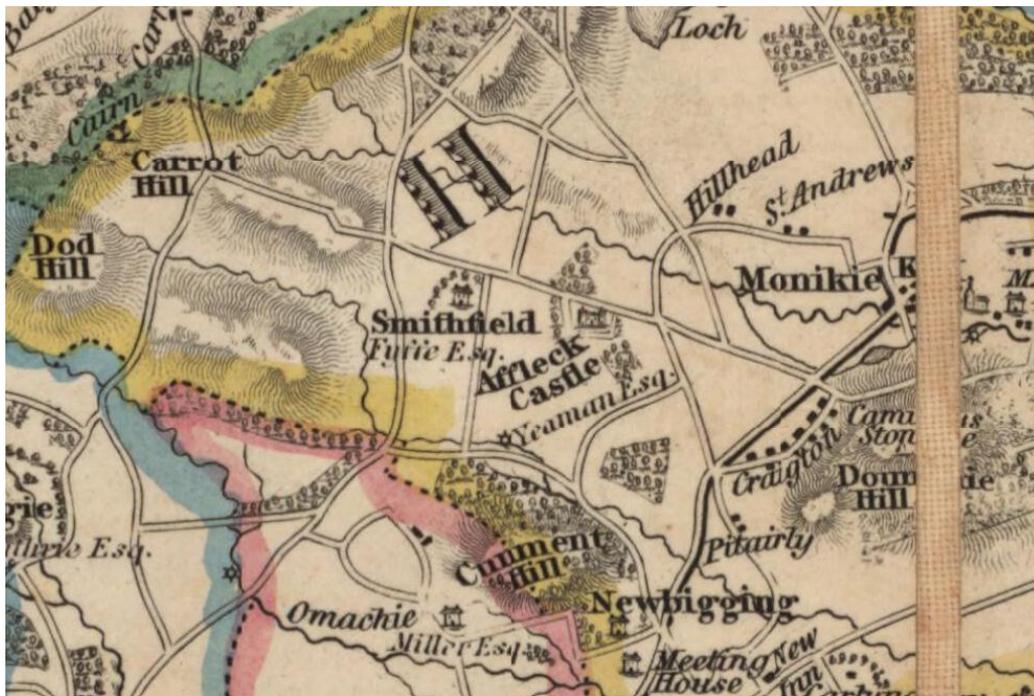
Appendices

Appendix A:	313
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ID: 01 Canmore ID: 33311 NGR: NO 49402 38808	Name: Affleck Alternatives: Auchenleck, Auchlouch, Auchlek	Latitude: 56.53854038 Longitude: -02.82435317 (WGS84)
Geographic References: Maps: Pont 26 (1601) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. (mill) – LI.5 (1865) O.S. –LI.1, Monikie (1865) O.S. – Sheet 57, Forfar and Dundee (1927)	Archaeological References: Architecture: MacGibbon and Ross: Vol. 1, 250-255 Tranter (1970) vol 4, 93	Documentary References: Manuscript: GD19/5 Printed Manuscripts: RMS, <i>vol ii</i> , no. 994; 1038, 2805
Secondary Sources: Books: Simpson (1947)	Articles or Chapters: Coventry (2001) 47 Dunbar (1966) 63 Walker and Ritchie(1987) 53	Attribute Terms Used: Structural: Castle Fortalice Landscape Features Mill Tenements Advowson and Donation of church and chaplain



Affleck Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁵



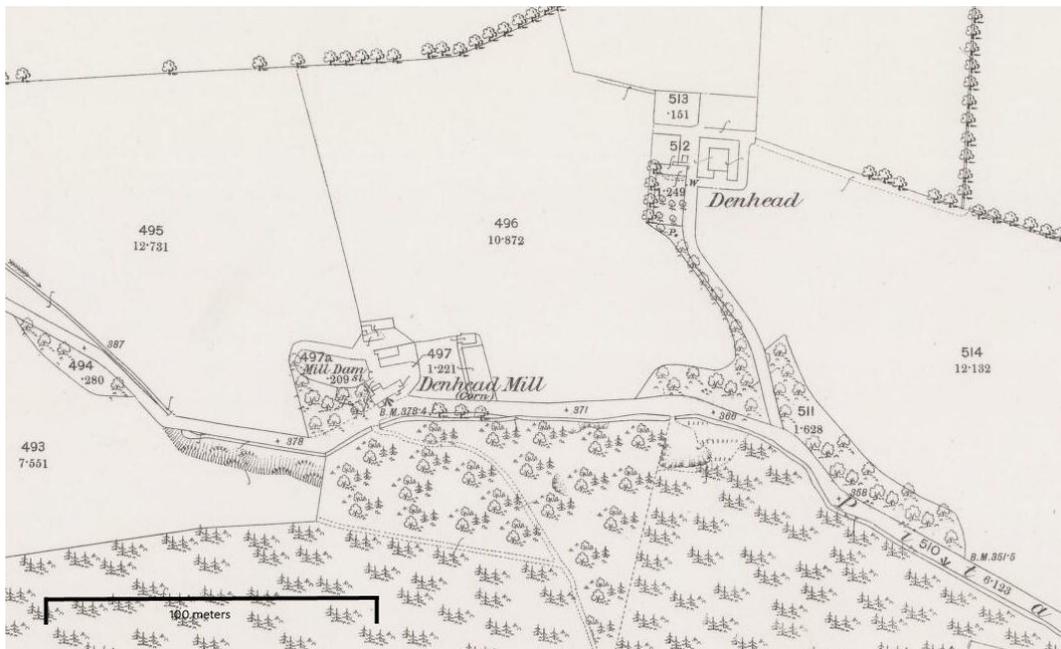
Affleck Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁶

⁵ Image covers approximately 9km².

⁶ Image covers approximately 35km².



Affleck Castle Depicted in O.S. LI.1, 1865; Reproduced by permission of the National Library of Scotland⁷



Affleck Castle Mill Depicted in O. S. LI.5 (1865); Reproduced by permission of the National Library of Scotland

⁷ Image covers approximately 3km².



Affleck Castle Depicted in O.S. Sheet 57, Forfar and Dundee, 1927; Reproduced by permission of the National Library of Scotland

ID: 02 Canmore ID: 31048 NGR: NO 29280 52192	Name: Airlie Alternatives: Airly, Errolly, Eroly, Erлие, Erly, Iroly	Latitude: 56.656155 Longitude: -03.155146 (WGS84)
Geographic References: Maps: Pont 26 (1601) Pont 29 (1601) Gordon 41 (1652) Gordon 42 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. - XXXVII. 1, (1865) O.S. –Sheet 49, Blairgowrie, (1961)	Archaeological References: Architecture: MacGibbon and Ross: Vol.5, 216-8	Documentary References: Manuscript: GD16/1/96 GD16/1/6 GD16/1/4 GD16/3/43 GD16/12/291 GD16/25/131 Printed Manuscripts: <i>RMS, vol ii, no. 683;</i> 1547; <i>RMS, vol iii, no. – 1990;</i> 2761 <i>RMS, vol iv, no. – 567;</i> 1755; 1866
Secondary Sources: Books: Warden (1885), 328 NSA v. 11, 676, 679 OSA v. 11, 211	Articles or Chapters: Batey (1975), 25 Coventry (2001), 48 Cumming (1848), 154 Forman (1963), 732 Forman (1967), 105 Girouard (1963), 976	Attribute Terms Used: Structural: Castle Landscape Features Woodland Mill Fishings

Table of Coordinates Used for Creating Airlie Map:

ID	Latitude	Longitude
Airlie	56.65617	-3.15544
Airlie Fishings 1	56.6599	-3.16781
Airlie Fishings 2	56.64475	-3.14868
Airlie Fishings 3	56.63913	-3.15259
Airlie Fishings 4	56.63626	-3.16665
Airlie Fishings 5	56.63563	-3.17811
Airlie Mill	56.6369	-3.15637



Airlie Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Airlie Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁸

⁸ Images covers approximately 18km².



Airlie Castle Depicted in Pont 29, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁹



Airlie Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹⁰

⁹ Image covers approximately 9km².

¹⁰ Images covers approximately 7km².



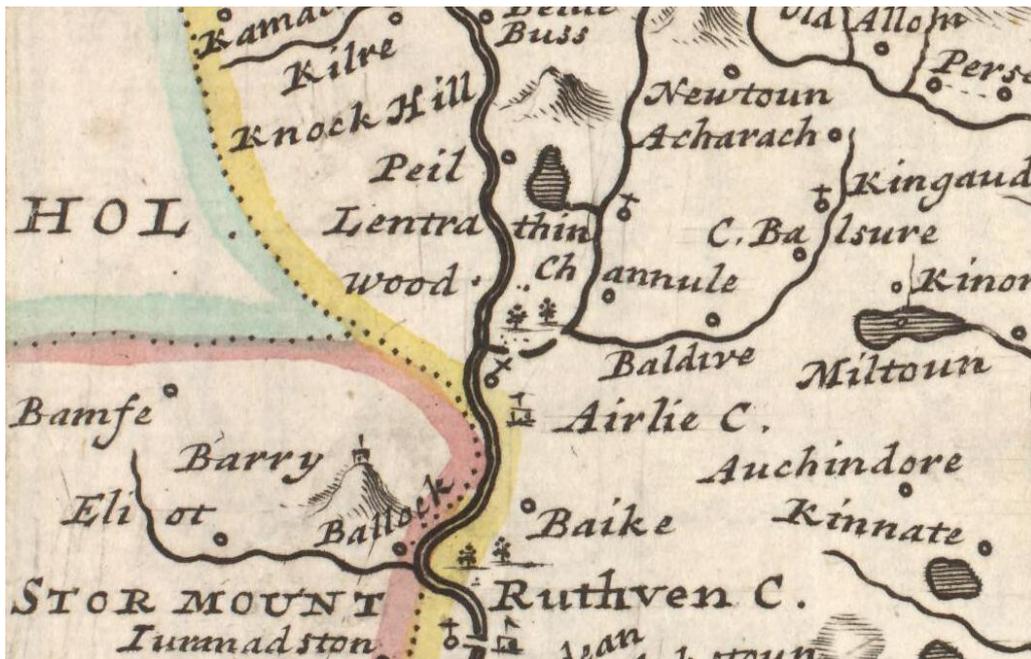
Airlie Castle Depicted in Gordon 42, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹¹



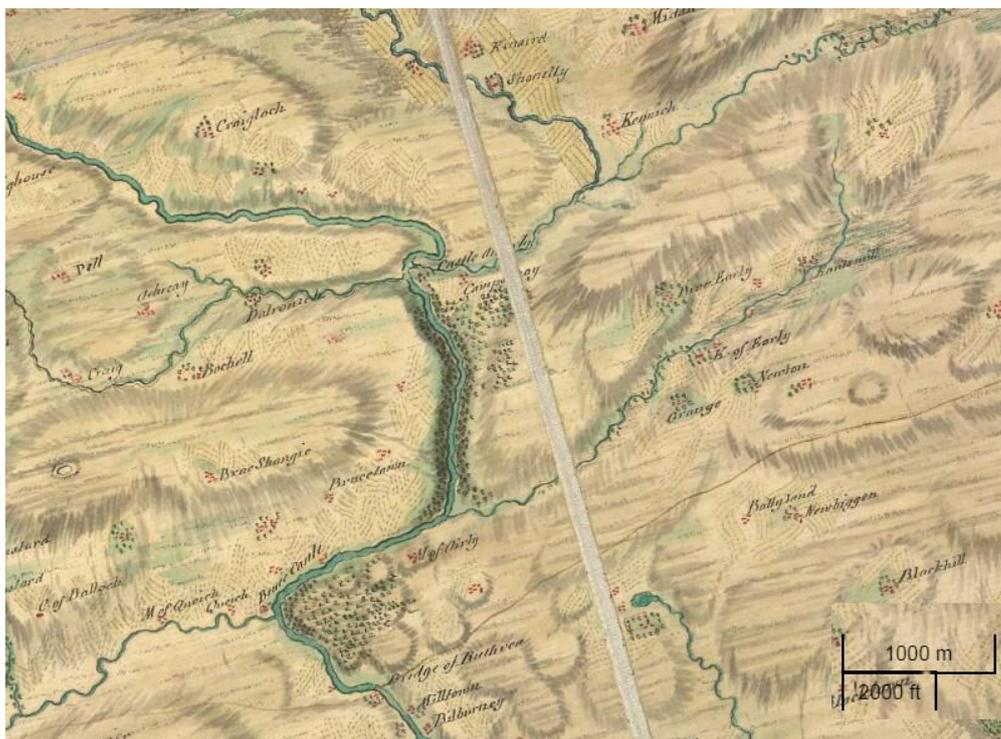
Airlie Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹²

¹¹ Images covers approximately 15km².

¹² Images covers approximately 30km².



Airlie Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹³



Airlie Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

¹³ Images covers approximately 35km².



Airlie Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹⁴



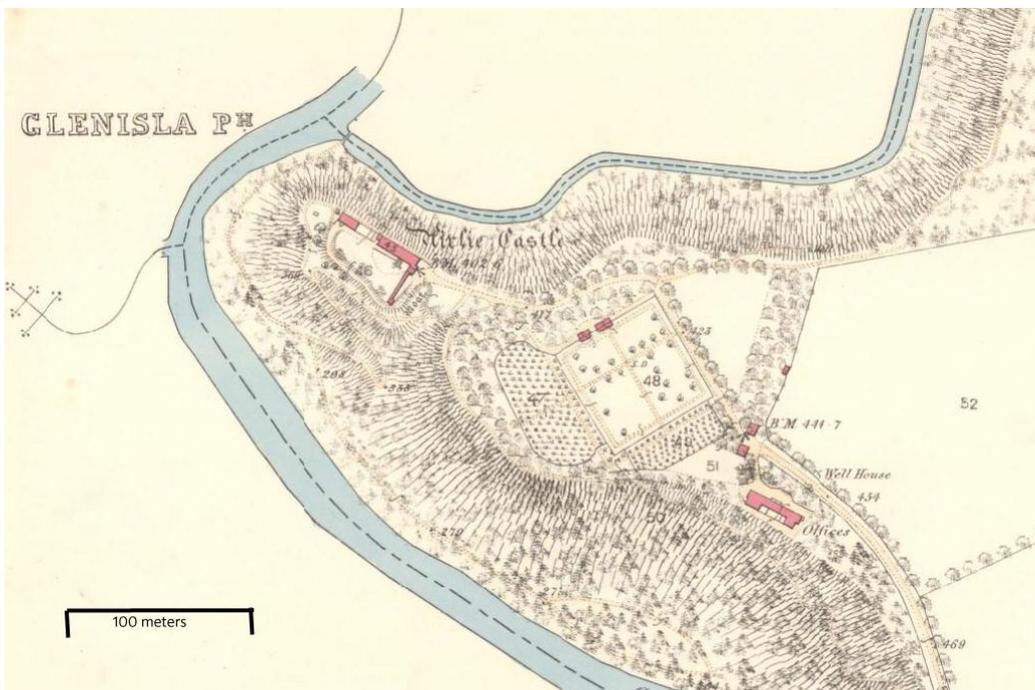
Airlie Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹⁵

¹⁴ Images covers approximately 35km².

¹⁵ Images covers approximately 9km².



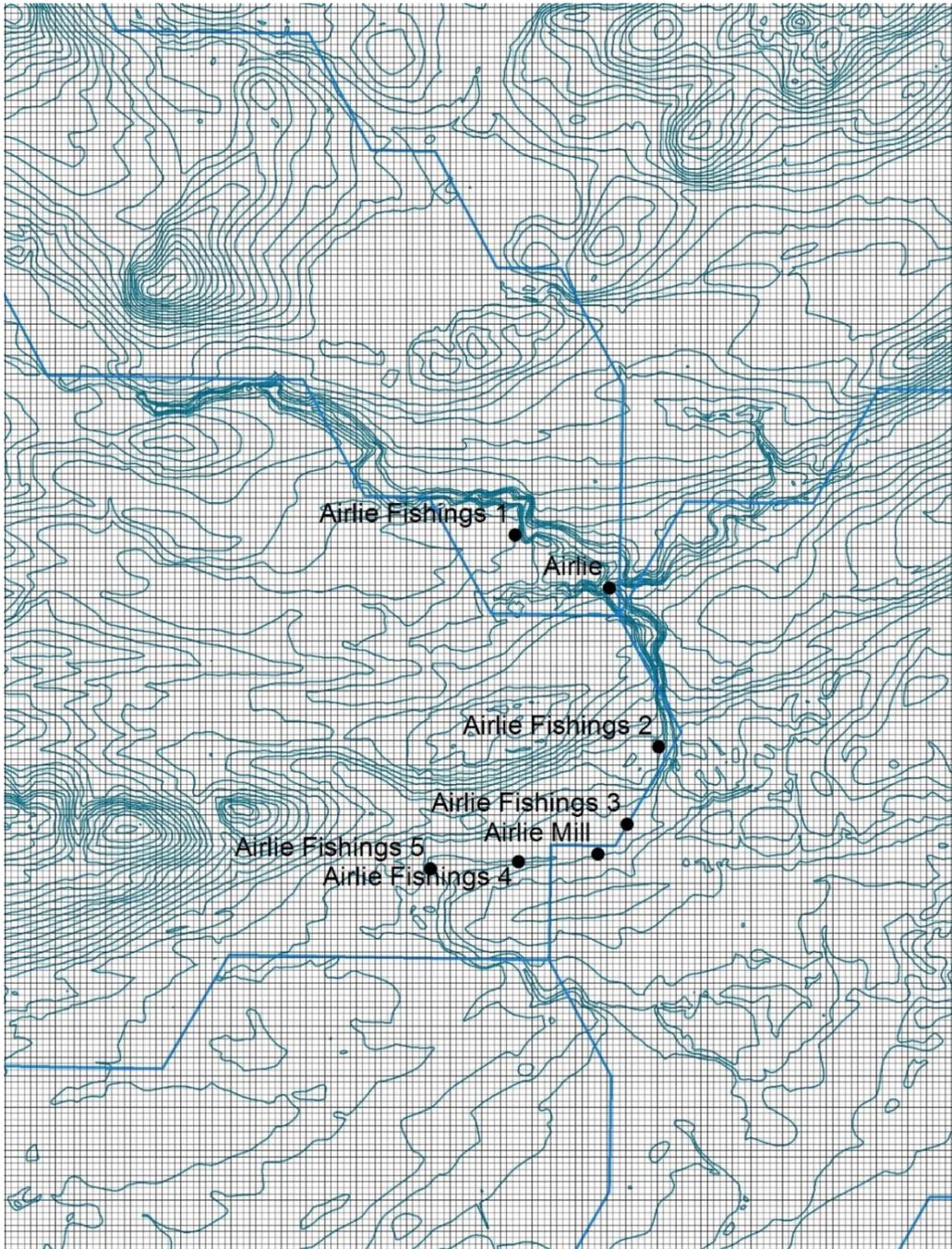
Airlie Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland



Airlie Castle Depicted in O.S. XXX.VII. 1 1865; Reproduced by permission of the National Library of Scotland



Airlie Castle Depicted in O.S. Sheet 49, Blairgowrie, 1961; Reproduced by permission of the National Library of Scotland

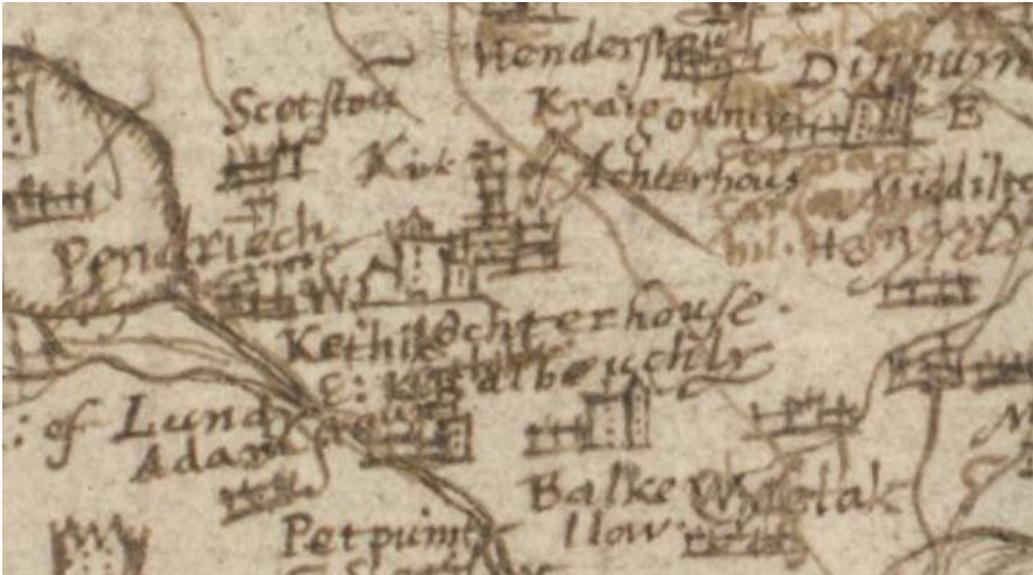


Map of Airlie Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

<p>ID: 03 Canmore ID: 223082 NGR: NO 33152 37282</p>	<p>Name: Auchterhouse Alternatives: Ochtherous, Uchtirous, Ochtirous, Oucterous, Owchtirous, Ochterbous, Uchterous, Uchterhous</p>	<p>Latitude: 56.5228756112 Longitude: - 03.08873288145 (WGS84)</p>
<p>Geographic References: Maps: Pont 26 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XLIX.6 (Auchterhouse)- (1865) O.S. – Forfar Sheet XLIX. NW -(1926)</p>	<p>Archaeological References:</p>	<p>Documentary References: Manuscript: GD16/6 GD123/54 GD124/1/1063 GD124/1/1065 Printed Manuscripts: RMS, vol ii, no. 220; 221; 597; 1561; 41; 1396; 1857; 2043; 2098; 2517; 81; 1396; 2098. RMS, vol iii, no. 305; 358; 597; 625; 1451; 2888; 1850; 625.</p>
<p>Secondary Sources: Books: Articles:</p>		<p>Features in Landscape: Manor-house Castle Fortalice Mill</p>



Auchterhouse Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Auchterhouse Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland¹⁶

¹⁶ Image covers approximately 60km².



Auchterhouse Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹⁷



Auchterhouse Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹⁸

¹⁷ Image covers approximately 13km².

¹⁸ Image covers approximately 25km².



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Auchterhouse Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

¹⁹ Image covers approximately 38km².



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Auchterhouse Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland²¹

²⁰ Image covers approximately 32km².

²¹ Image covers approximately 30km².



Auchterhouse Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland²²

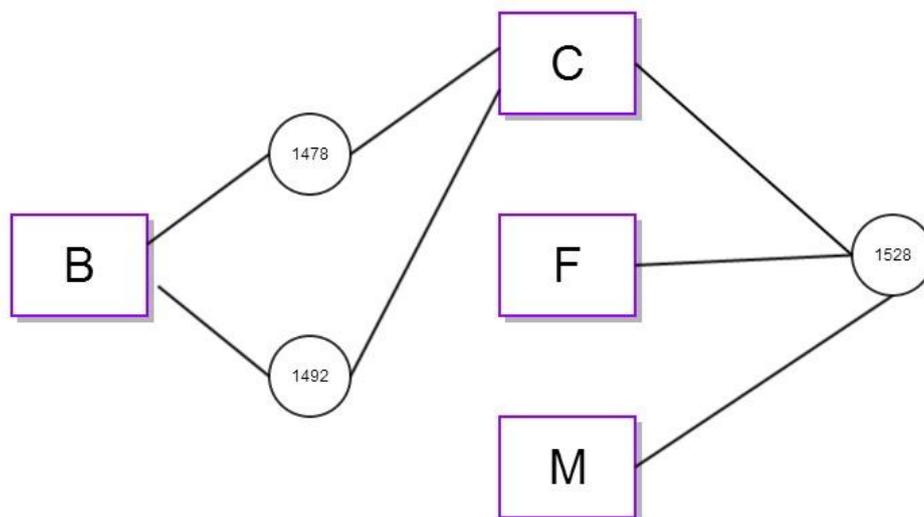


Auchterhouse Depicted in O.S. Forfar Sheet XLIX.6 (Auchterhouse) 1865; Reproduced by permission of the National Library of Scotland

²² Image covers approximately 10km².



Auchterhouse Depicted in O.S. Forfar Sheet XLIX.NW 1926; Reproduced by permission of the National Library of Scotland

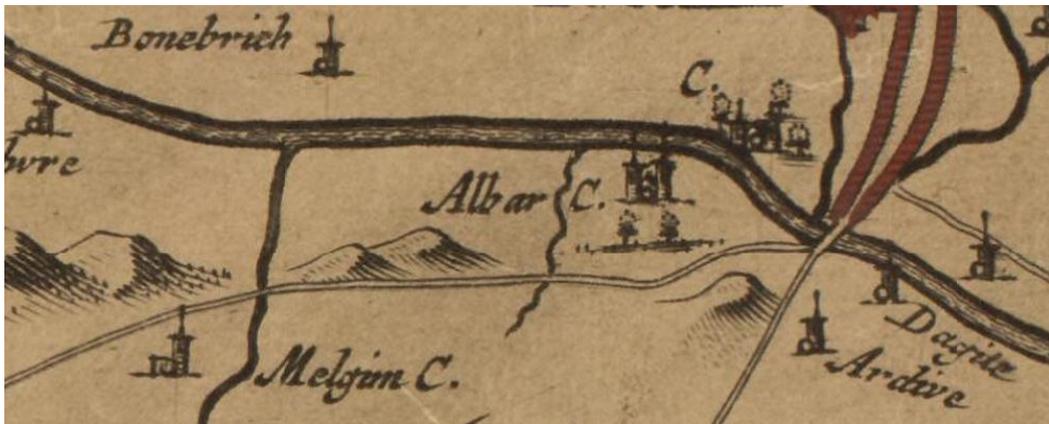


Graph of the Attribute Features of Auchterhouse; Copyright Kate Buchanan

ID: 04 Canmore ID: 34787 NGR: NO 57421 57970	Name: Aldbar Alternatives: Auldbar, Aulbar	Latitude: 56.7112428339 Longitude: -2.69780475659 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXXIII.4 (Aberlemno) – (1865) O.S. – Sheet 50, Forfar (1961)	Archaeological References: Architecture: Tranter, vol 4, 96.	Documentary References: Manuscript: GD1/176 GD16/41/8 GD20/7/196 Printed Manuscripts: <i>RMS, vol iii, no.</i> – 2194; 2574; <i>RMS, vol iv, no.</i> – 3008; 3009
Secondary Sources: Books: Warden, vol 2, 304-305. Jervise, Memorials, 303.	Articles or Chapters:	Attribute Terms Used: Structural: Tower Landscape Features: Mill Fishing Garden Orchard Place Message



**Site of Albar Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



**Albar Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of
Scotland²³**

²³ Image covers approximately 20km².



Aldbar Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland²⁴



Aldbar Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

²⁴ Image covers approximately 25km².



Aldbar Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland²⁵



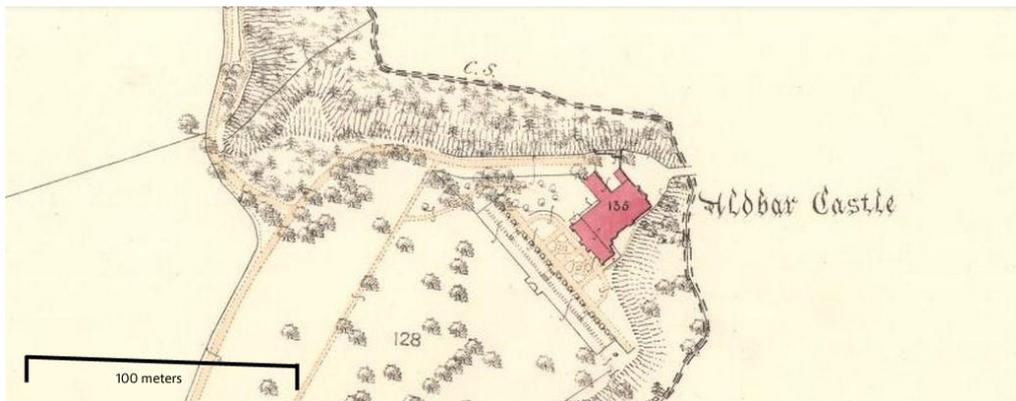
Aldbar Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland²⁶

²⁵ Image covers approximately 16km².

²⁶ Image covers approximately 7km².

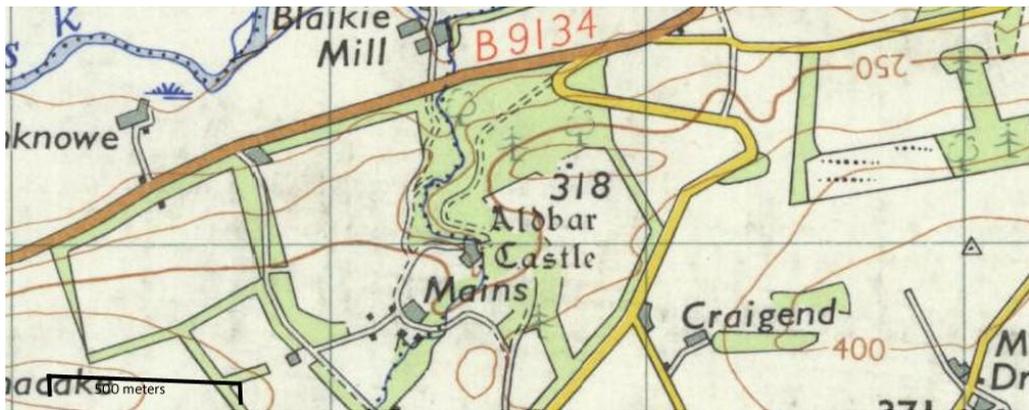


Auldbar Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland²⁷

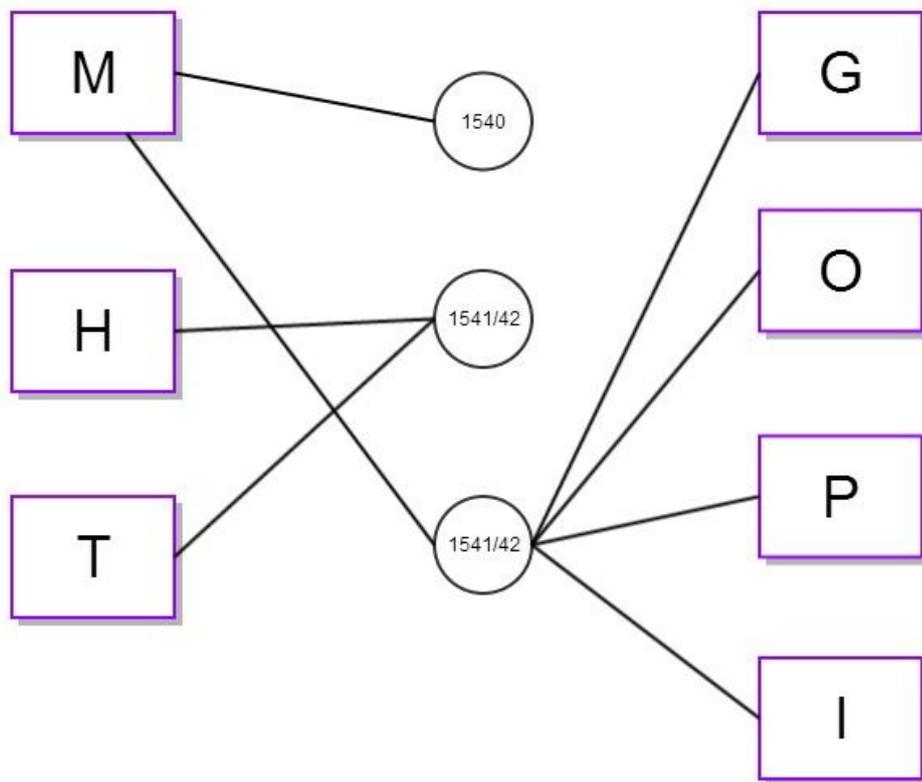


Auldbar Castle Depicted in O.S. Forfar Sheet XXXIII.4 (Aberlemno) 1865; Reproduced by permission of the National Library of Scotland

²⁷ Image covers approximately 30km².



Aldbar Castle Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland



Graph of the Attribute Features of Aldbar; Copyright Kate Buchanan

ID: 05 Canmore ID: 32133 NGR: NO 3184 4932	Name: Baikie Alternatives: Baky	Latitude: 56.6306578199 Longitude: -3.11260294593 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850)	Archaeological References: Architecture:	Documentary References: Manuscript: GD52/1564 Printed Manuscripts: <i>RMS, vol ii, no. - 178; 220; 618; 631; 735; 1626; 1764; 1871; 1872; 1674; 1764;</i> <i>RMS, vol iii, no. – 526; 1931; 2233; 1872; 1931; 1990; 2093; 2761</i> <i>RMS, vol iv, no. – 1792; 1866; 294; 473; 1792; 1866;</i>
Secondary Sources: Books: Old Statistical Account, vol 11, 212.	Articles or Chapters: Jervise, 1865, Notice of, PSAS, 347.	Attribute Terms Used: Structural: Manor-house Fortalice Mansion Landscape Features: Messuage Loch Garden



**Baikie Castle Site Aerial View: Getmapping plc, DigitalGlobe, Map Data
 Copyright Google 2014**



Baikie Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland²⁸



Baikie Castle Depicted in Pont 29, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland

²⁸ Image covers approximately 18km².



Baikie Castle Depicted in Gordon 42, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland²⁹



Baikie Caslte Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland³⁰

²⁹ Image covers approximately 20km².

³⁰ Image covers approximately 30km².



Baikie Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland³¹



Baikie Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board



Baikie Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland³²

³¹ Image cover approximately 10km².

³² Image covers approximately 10km².



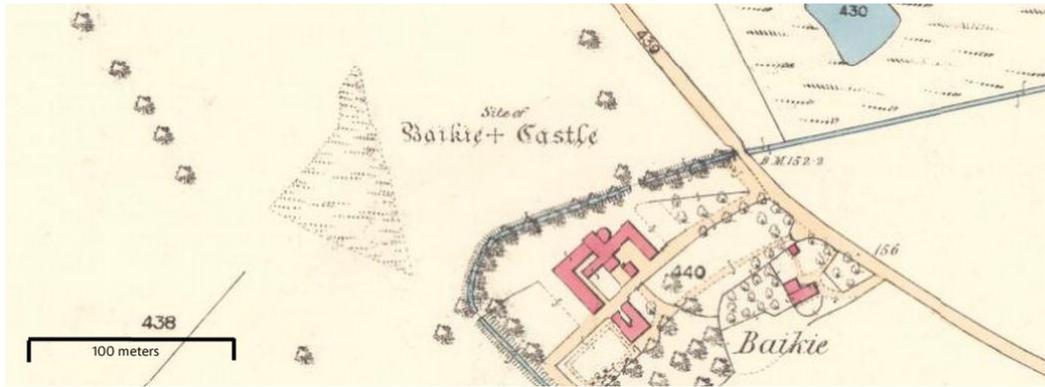
Baikie Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland³³



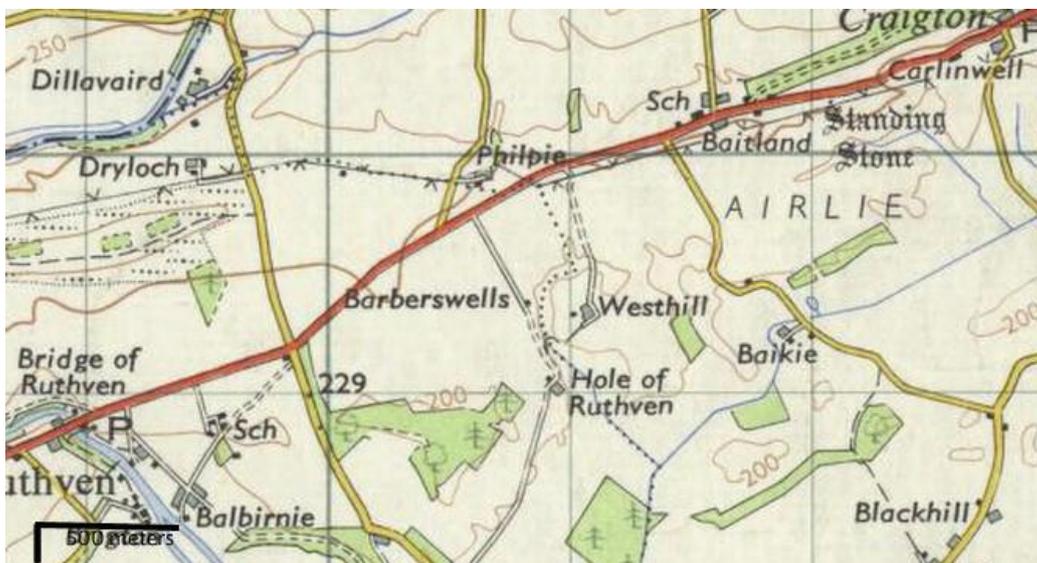
Baikie Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland³⁴

³³ Image covers approximately 18km².

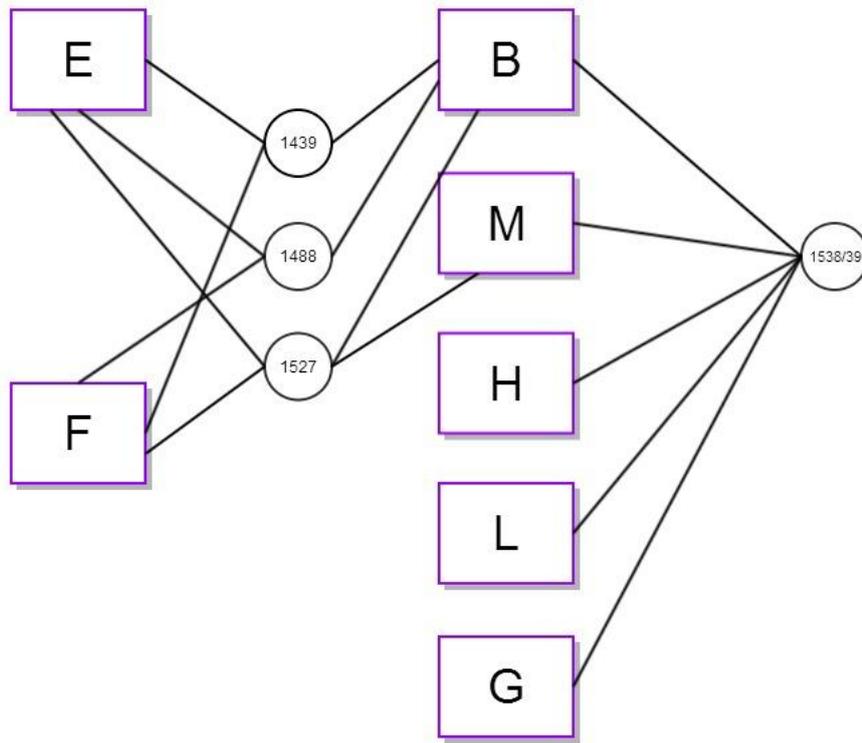
³⁴ Image covers approximately 10km².



Baikie Castle Depicted in O.S. Forfar Sheet XXXVII.10 (Airlie) 1865; Reproduced by permission of the National Library of Scotland



Baikie Castle Depicted in O.S. Sheet 49, Blairgowrie, 1961; Reproduced by permission of the National Library of Scotland



Graph of the Attribute Features of Baikie; Copyright Kate Buchanan

ID: 06 Canmore ID: 35717 NGR: NO 6570 5590	Name: Bonnyton Alternatives: Bonytoun, Bonetoun, Bonyntoun	Latitude: 56.6934242952 Longitude: -02.56168027778 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Northwest – (1794) Thomson – Northern (1832) O.S. – Forfarshire, Sheet XXXIV. NE (1901) O.S. – NO 65 & NO75 (1957)	Archaeological References: Architecture:	Documentary References: Manuscript: GD45/21 GD70/9 GD185/1/49 Printed Manuscripts: RMS, vol iii, no. 2623.
Secondary Sources: Books: Old Statistical Account, vol 9, 399-400. New Statistical Account, vol 11, 116-117. Warden, vol 4, 310-311. Ordnance Survey Name Book, Book 68, 14. Coventry, 94.	Articles or Chapters:	Attribute Terms Used: Structural: Castle Tower Fortalice Landscape Features: Woodland Park Fishing Mill

Table of Coordinates Used for Creating Bonnyton Map:

ID	Longitude	Latitude
Bonnyton	56.69342	-2.56168
Bonnyton Fishings 1	56.69107	-2.55484
Bonnyton Fishings 2	56.70555	-2.53055
Bonnyton Fishings 3	56.70244	-2.52104
Bonnyton Fishings 4	56.70824	-2.53141
Bonnyton Fishings 5	56.71164	-2.53358
Bonnyton Mill	56.68913	-2.55613



**Bonnyton Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



**Bonnyton Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of
Scotland³⁵**

³⁵ Image covers approximately 28km².



Bonnyton Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

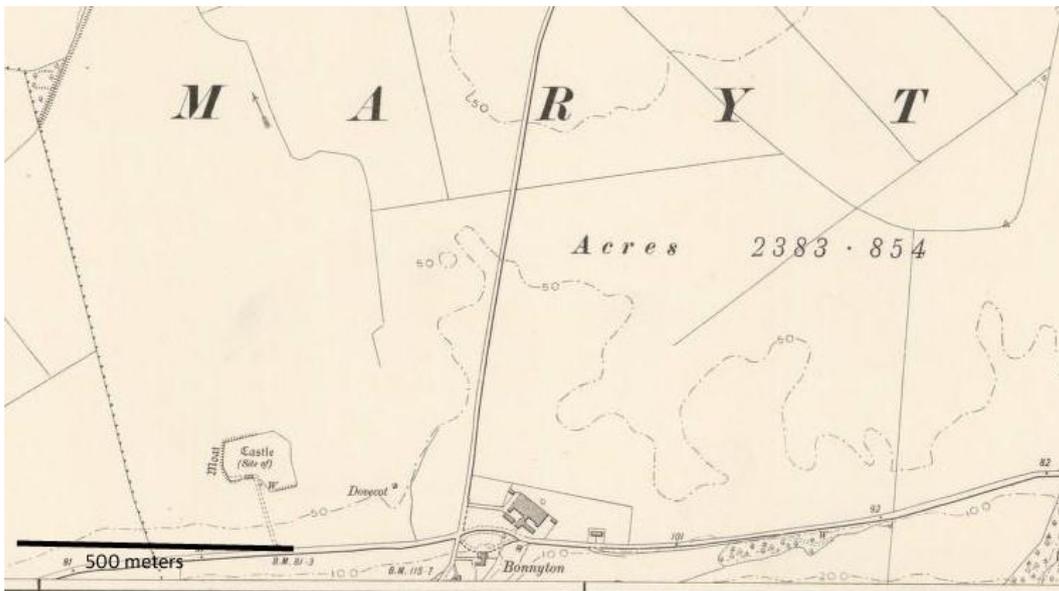


Bonnyton Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland³⁶

³⁶ Image covers approximately 8km².

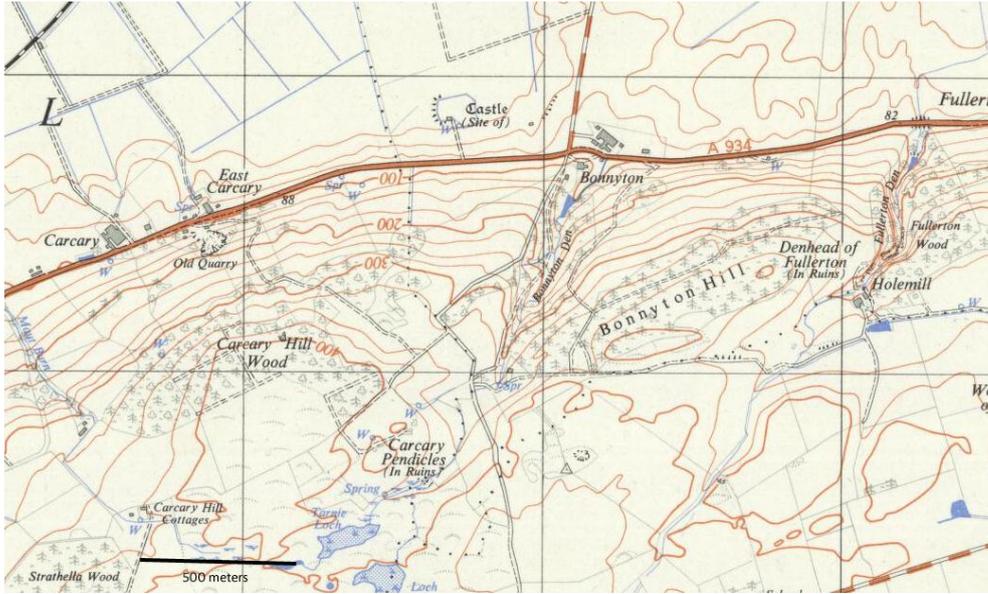


Bonnyton Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland³⁷

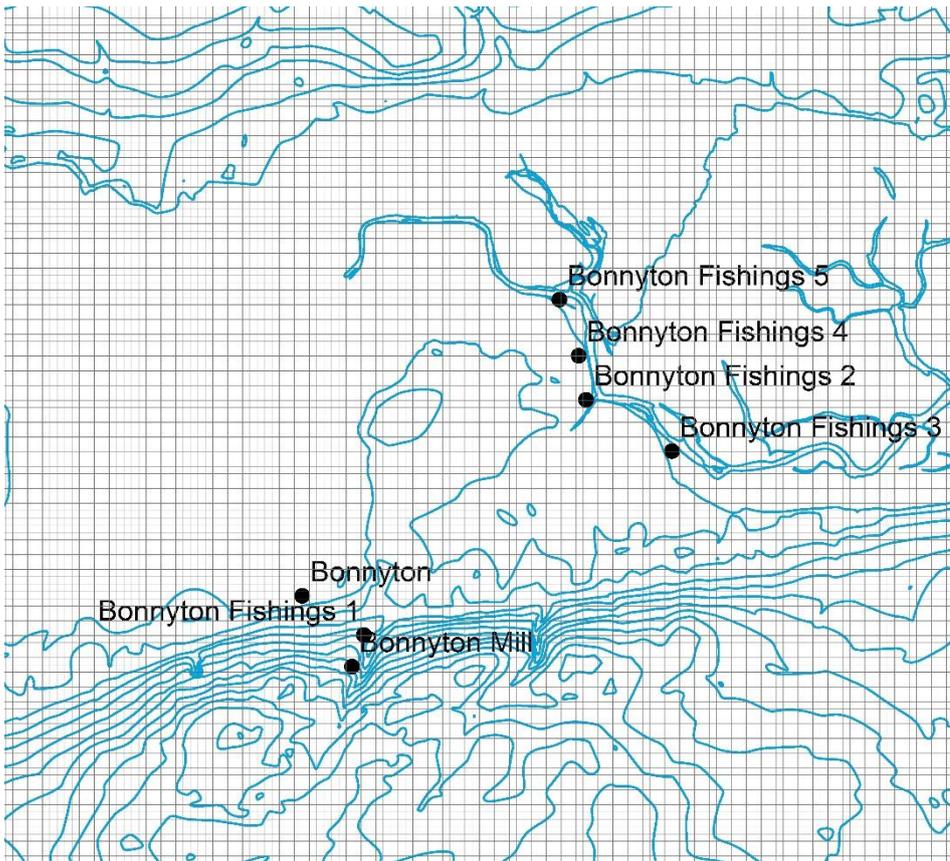


Bonnyton Castle Depicted in O.S. Forfarshire, Sheet XXXIV.NE, 1901; Reproduced by permission of the National Library of Scotland

³⁷ Image covers approximately 10km².



Bonnyton Castle Depicted in O.S. NO 65 & NO75, 1957; Reproduced by permission of the National Library of Scotland



Map of Bonnyton Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

ID: 07 Canmore ID: 34782 NGR: NO 59782 59892	Name: Brechin Alternatives:	Latitude: 56.728947 Longitude: - 2.658877 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXVII.13 (Combined) – (1865) O.S. Sheet 50 – Forfar (1961)	Archaeological References: Tranter, vol 4, 172.	Documentary References: Manuscript: GD45/18/1530-1671 GD45/29/67-75 RHP35167 RHP35168 RHP35169 Printed Manuscripts: <i>RMS, vol ii, no. 136.</i> <i>RMS, vol ii, no. 1111.</i> <i>RMS, vol ii, no. 1358.</i> <i>RMS, vol iii, no. 516.</i> <i>RMS, vol iii, no. 1148.</i> <i>RMS, vol iii, no. 2320.</i> <i>RMS, vol iii, no. 2522.</i>
Secondary Sources: Books: Jervise, Memorials, 125-127.	Articles: Findlay, 1970, 12-23.	Attribute Terms Used: Structural: Castle Fortalice Landscape Features Mill Fishing



Brechin Caslte; Copyright Kate Buchanan



Brechin Castle Fishing Cruive; Copyright Kate Buchanan



**Brechin Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



Brechin Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland³⁸



Brechin Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland³⁹

³⁸ Image covers approximately 60km².

³⁹ Image covers approximately 65km².



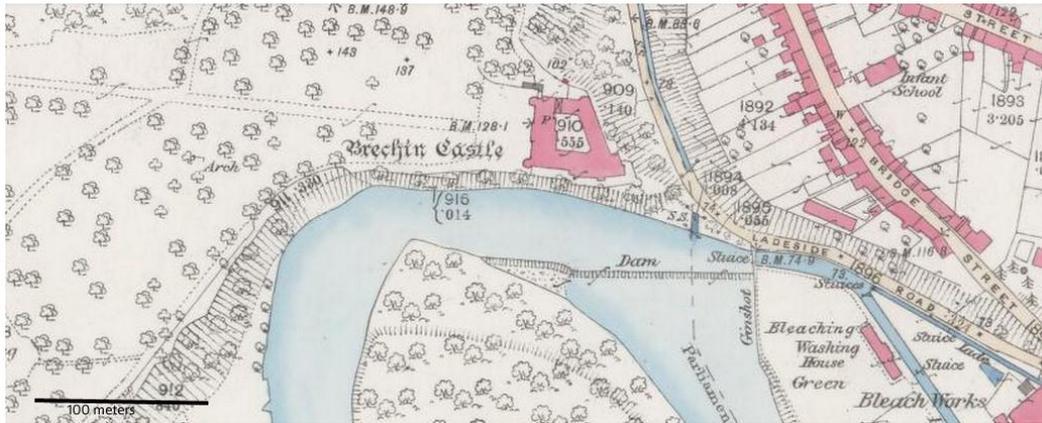
Brechin Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁴¹



Brechin Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁴²

⁴¹ Image covers approximately 60km².

⁴² Image covers approximately 60km².



Brechin Castle Depicted in O.S. Forfar Sheet XXVII.13 (Combined) 1865; Copyright Library of Scotland



Brechin Castle Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland

ID: 08 Canmore ID: 33391 NGR: NO 46475 30427	Name: Broughty Alternatives: Bruchty, Brochty, Brochtie	Latitude: 56.462893999 Longitude: -02.87019808116 (WGS84)
Geographic References: Maps: Pont 26 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. Sheet 49, Arbroath (1888) O.S. NO 43 (1957)	Archaeological References: Architecture: MacGibbon and Ross: Vol.4, 386.	Documentary References: Manuscript: GD121/1/111/27A RHP60283/1 RHP6075 Printed Manuscripts: RMS, vol ii, no. 1959. RMS, vol ii, no. 3419. RMS, vol iii, no. 259. RMS, vol iii, no. 2650.
Secondary Sources: Books: Mudie, Walker and MacIvor, 1970. Warden, vol 3, 52.	Articles or Chapters: Baker, 1993, D.E.S., 97-98. Ewart, 2003, D.E.S., 52. O’Grady, 2009, D.E.S., 61. Murray, 2009, D.E.S., 62.	Attribute Terms Used: Structural: Castle Fortalice Landscape Features: Fishing Mill

Table of Coordinates Used for Creating Broughty Map:

ID	Longitude	Latitude
Broughty	56.46289	-2.8702
Broughty Fishings 1	56.46485	-2.90799
Broughty Fishings 2	56.46219	-2.85584
Broughty Fishings 3	56.46184	-2.86904
Broughty Fishings 4	56.46264	-2.87272
Broughty Fishings 5	56.46375	-2.87369
Broughty Mill	56.4833	-2.87856



Broughty Castle; Copyright Kate Buchanan



Broughty Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Broughty Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁴³



Broughty Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁴⁴

⁴³ Image covers approximately 30km².

⁴⁴ Image covers approximately 45km².



Broughty Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁴⁵



Broughty Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁴⁶

⁴⁵ Image covers approximately 33km².

⁴⁶ Image covers approximately 35km².



Broughty Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

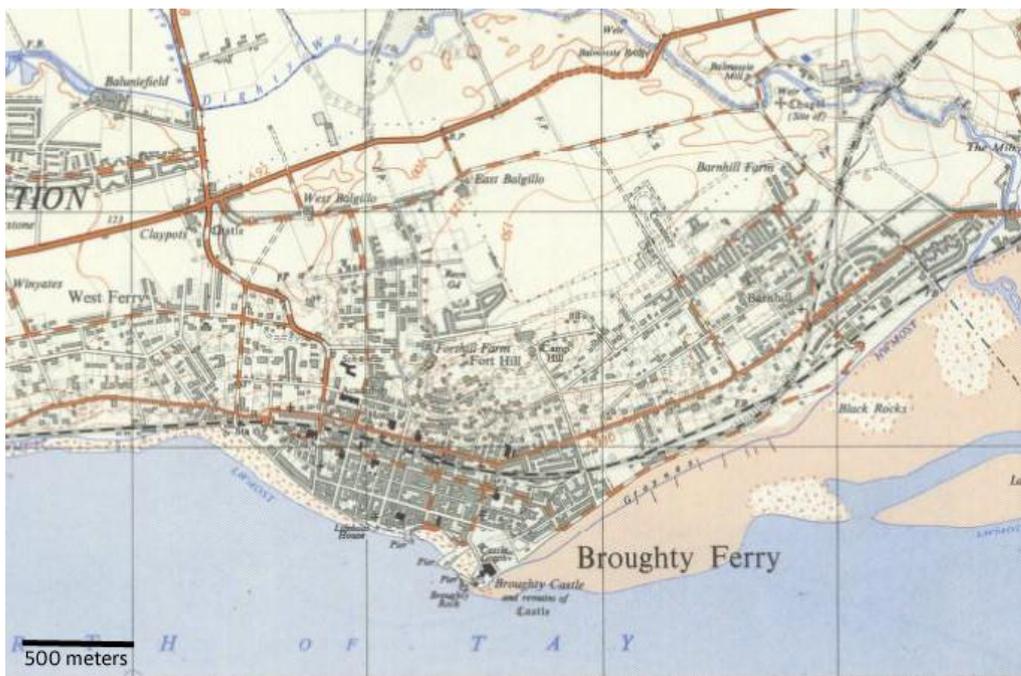


Broughty Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁴⁷

⁴⁷ Image covers approximately 11km².

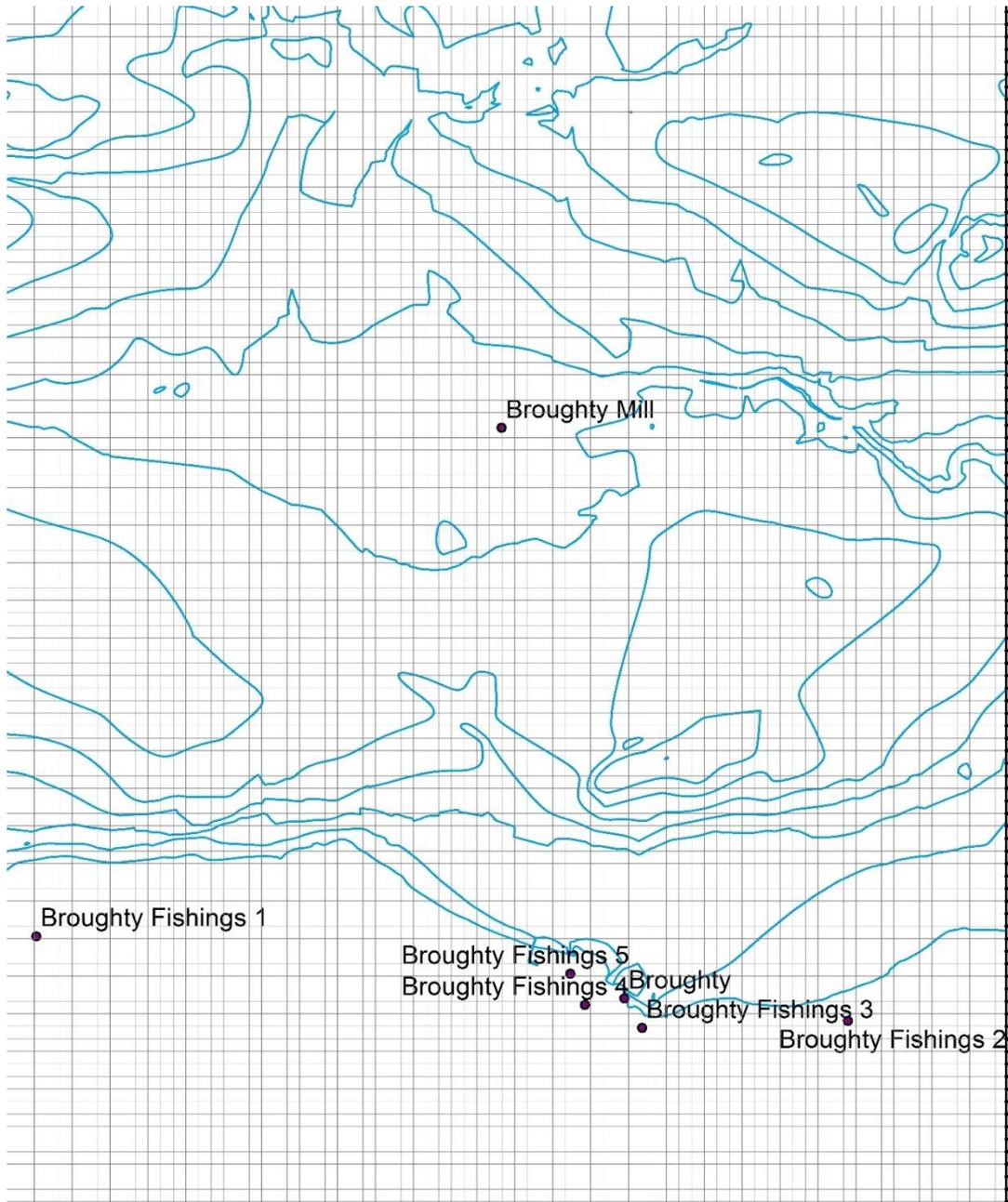


Broughty Castle Depicted in O.S. Sheet 49, Arbroath, 1888; Reproduced by permission of the National Library of Scotland ⁵⁰



Broughty Castle Depicted in O.S. NO 43, 1957; Reproduced by permission of the National Library of Scotland

⁵⁰ Image covers approximately 7km².



Map of Broughty Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

ID: 09 Canmore ID: 32165 NGR: NO 3484 4379	Name: Denoon Alternatives: Estir-Dunnoyne, Dunnon, Dunowne	Latitude: 56.5815212093 Longitude: -3.06233560255 (WGS84)
Geographic References: Maps: Pont 26 (1601) Pont 29 (1601) Edward (1678) Moll (1745) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. - Sheet 56, Blairgowrie (1870) O.S. –Sheet 50 Forfar, (1961)	Archaeological References: Architecture:	Documentary References: Manuscript: GD16/24/36 GD16/24/103 Printed Manuscripts: RMS, vol ii, no. 2158; 2218; 2218. <i>RMS, vol iii, no. 464; 1680; 1907; 2063; 2062; 1907; 2068; 464; 2539; 2444.</i> <i>RMS, vol iv, no. 2455.</i>
Secondary Sources: Books: Ordnance Survey Name Book, Book, 56.	Articles or Chapters:	Attribute Terms Used: Structural: Tower Fortalice Manor-house Landscape Features: Mill



Denoon Caslte Site Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Denoon Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁵³



Denoon Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁵⁴

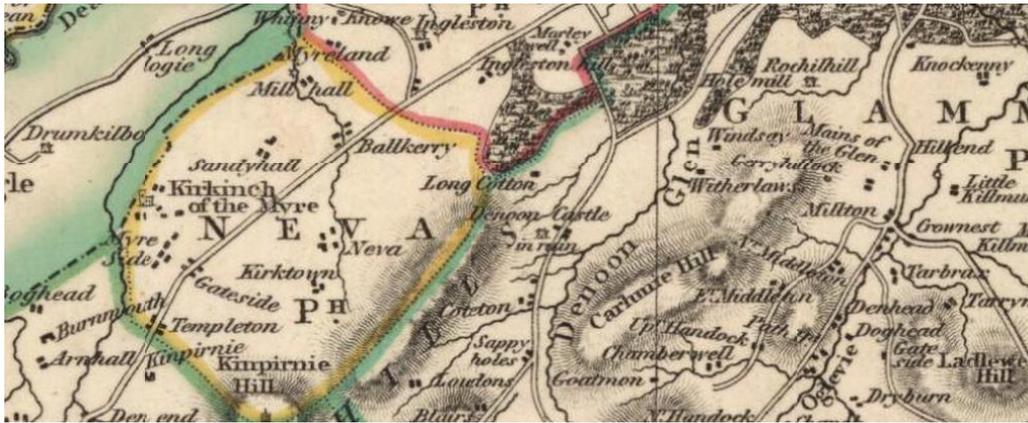


Denoon Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁵⁵

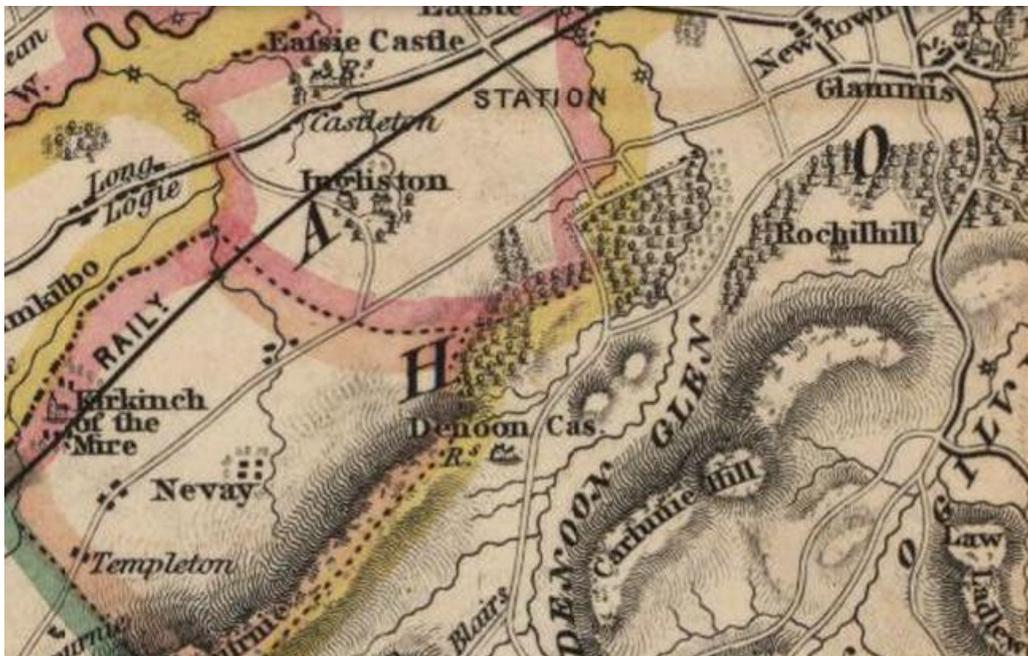
⁵³ Image covers approximately 20km².

⁵⁴ Image covers approximately 23km².

⁵⁵ Image covers approximately 20km².



Denoon Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁵⁶



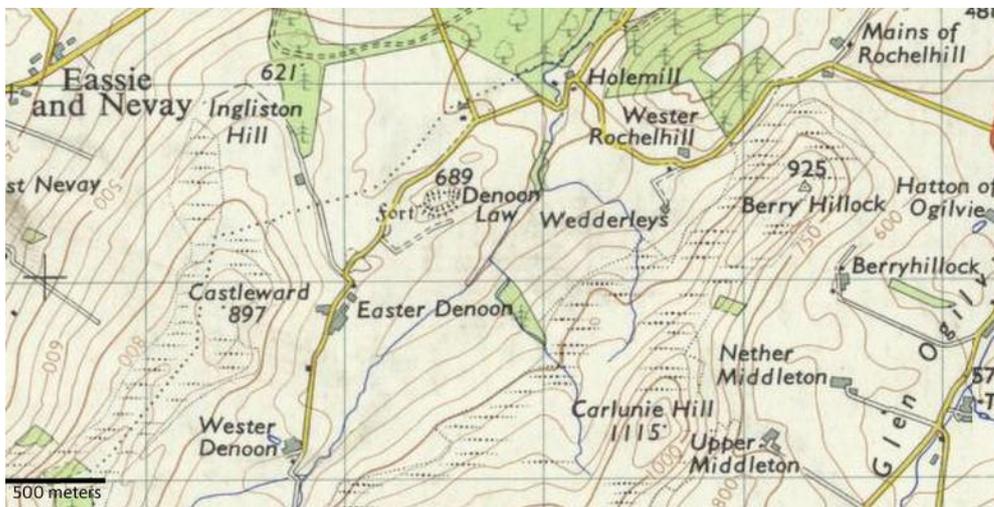
Denoon Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁵⁷

⁵⁶ Image covers approximately 25km².

⁵⁷ Image covers approximately 20km².

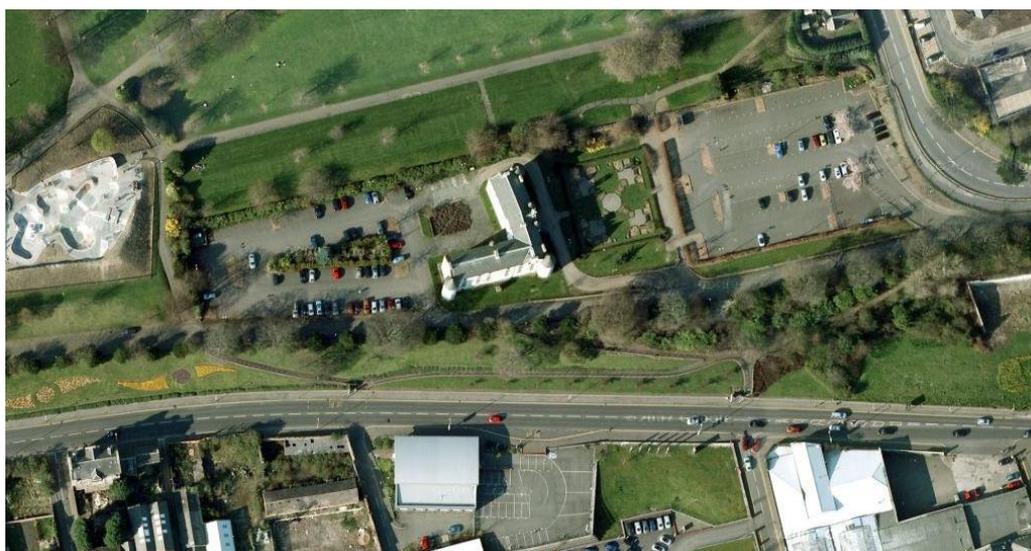


Denoon Castle Depicted in O.S. Sheet 56, Blairgowrie, 1870; Reproduced by permission of the National Library of Scotland



Denoon Castle Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland

ID: 10 Canmore ID: 31934 NGR: NO 39459 30670	Name: Dudhope Alternatives: Dudhop. Dudyp	Latitude: 56.4642821451 Longitude: -2.98386775785 (WGS84)
Geographic References: Maps: Pont 26 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet LIV– (1865) O.S. – Fofar Sheet 50, 1961	Archaeological References: Architecture: MacGibbon and Ross, VI. 4, 270. Tranter, vol 4, 112-114.	Documentary References: Manuscript: GD45/16/2280-2319 GD112/1/55 GD137 GD137/414 GD137/3756 GD137/3781 GD137/3854 GD137/3869 GD137/4030 GD181/3 Printed Manuscripts: RMS, vol iii, no. 407. RMS, vol iii, no. 2608.
Secondary Sources: Books: Lamb, 1895, Chap. 10.	Articles or Chapters: Carhart, 1992, D.E.S, 73. Driscoll, 1995, PSAS,125, 1106.	Attribute Terms Used: Structural: Tower Fortalice Landscape Features: Orchard Message Mill



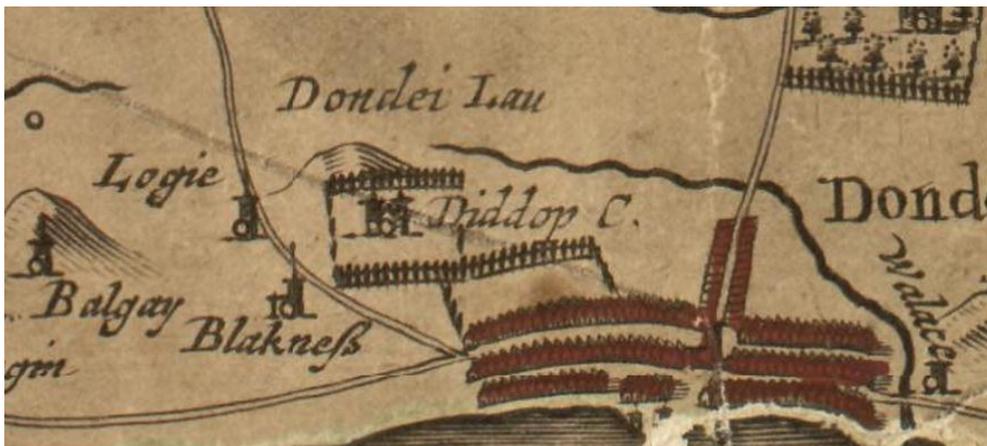
**Dudhope Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



Dudhope Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁵⁸



Dudhope Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁵⁹



Dudhope Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁶⁰

⁵⁸ Image covers approximately 30km².

⁵⁹ Image covers approximately 55km².

⁶⁰ Image covers approximately 20km².



Dudhope Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁶¹



Dudhope Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board



Dudhope Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁶²

⁶¹ Image covers approximately 30km².

⁶² Image covers approximately 20km².

ID: 11 Canmore ID: 35660 NGR: NO 6675 5988	Name: Dun Alternatives: Dwn, Dunn	Latitude: 56.7290750351 Longitude: -2.54482333187 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXVII.16 (Dun) – (1865) O.S.- Stonehaven and Brechin, Sheet 51 (1946) O.S. - NO65 &NO75 (1957)	Archaeological References: Architecture:	Documentary References: Manuscript: GD1/111/1 GD1/421/34 GD4/20 GD4/228 GD25/1/333 GD45/18/2393 GD123/1 GD123/13 GD123/93 GD123/94 Printed Manuscripts: RMS, vol iii, no. 1452 RMS, vol iii, no. 2640
Secondary Sources: Books: Warden, vol 3, 169. Ordnance Survey, Name Book, 1858, Book 17, 12. Jervise, 18.	Articles or Chapters:	
Property Owners: National Trust of Scotland		Attribute Terms Used: Structural: Castle Fortalice Mansion Landscape Features Mill Fishing

Table of Coordinates Used for Creating Dun Map:

ID	Latitude	Longitude
Dun	56.72908	-2.54482
Dun Fishings 1	56.71292	-2.55856
Dun Fishings 2	56.7152	-2.55705
Dun Fishings 3	56.71639	-2.55374
Dun Fishings 4	56.71621	-2.54897
Dun Fishings 5	56.71562	-2.54308
Dun Mill	56.72403	-2.545

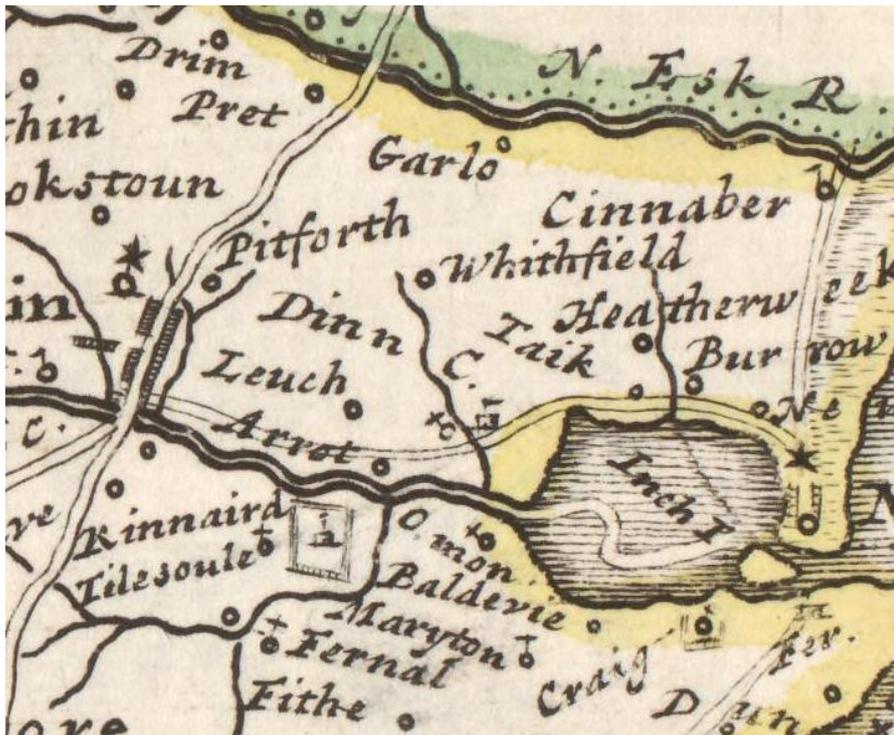


Dun Castle Site Aerial View: Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Dun Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁶⁵

⁶⁵ Image covers approximately 17km².



Dun Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁶⁶



Dun Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

⁶⁶ Image covers approximately 60km².



Dun Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁶⁷



Dun Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁶⁸

⁶⁷ Image covers approximately 12km².

⁶⁸ Image covers approximately 12km².

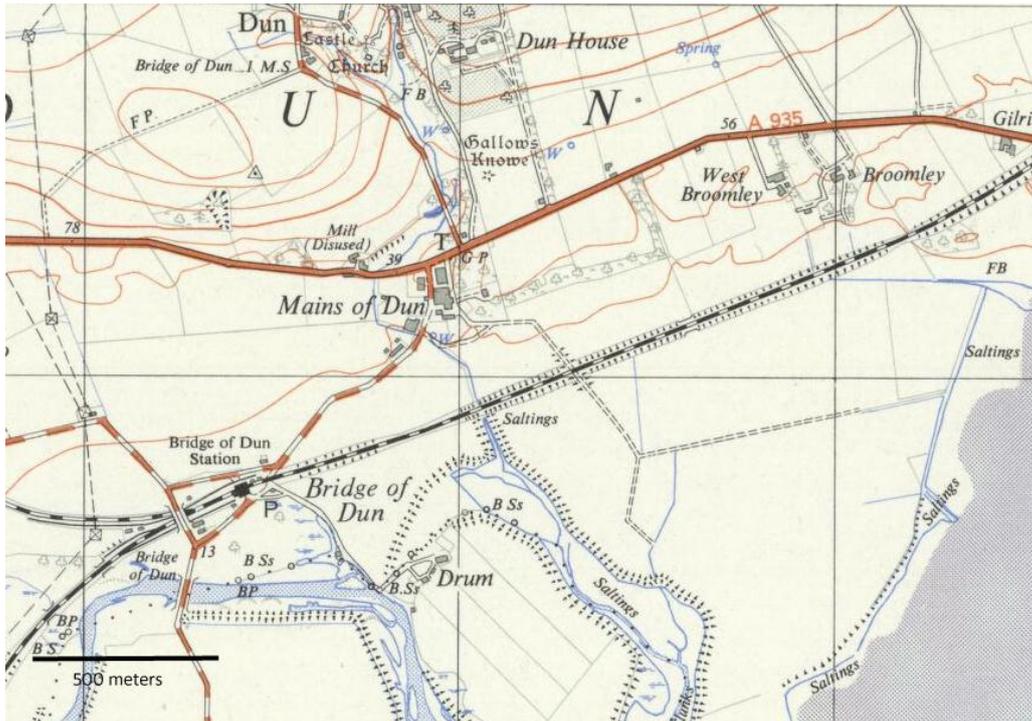


Dun Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁶⁹



Dun Castle Depicted in O.S. Forfar Sheet XXVII.16 (Dun), 1865; Reproduced by permission of the National Library of Scotland

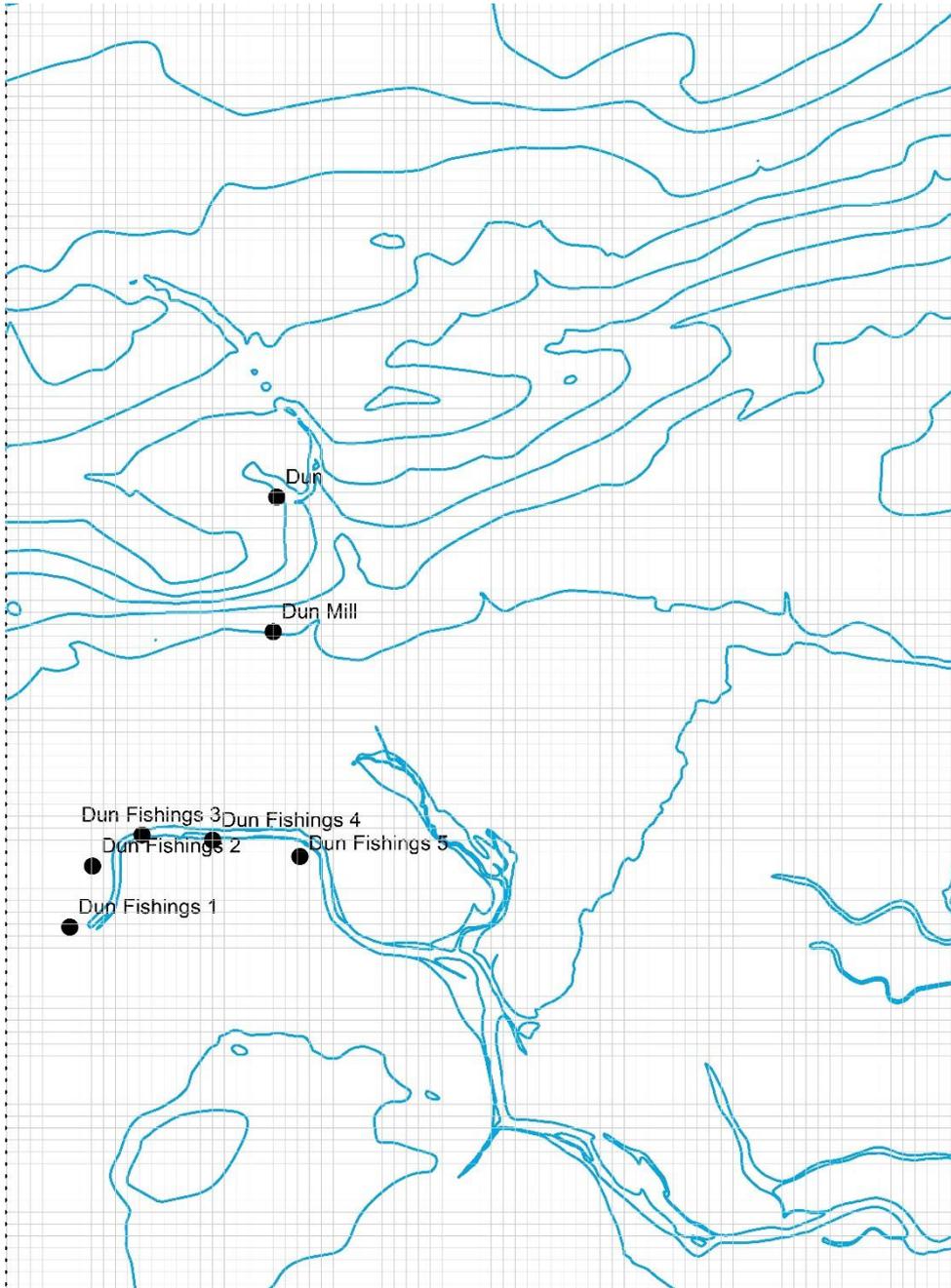
⁶⁹ Image covers approximately 15km².



Dun Castle Depicted in O.S. NO 65 & NO 75, 1957; Reproduced by permission of the National Library of Scotland



Dun Castle Depicted in O.S. Stonehaven and Brechin, Sheet 51; Reproduced by permission of the National Library of Scotland



Map of Dun Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

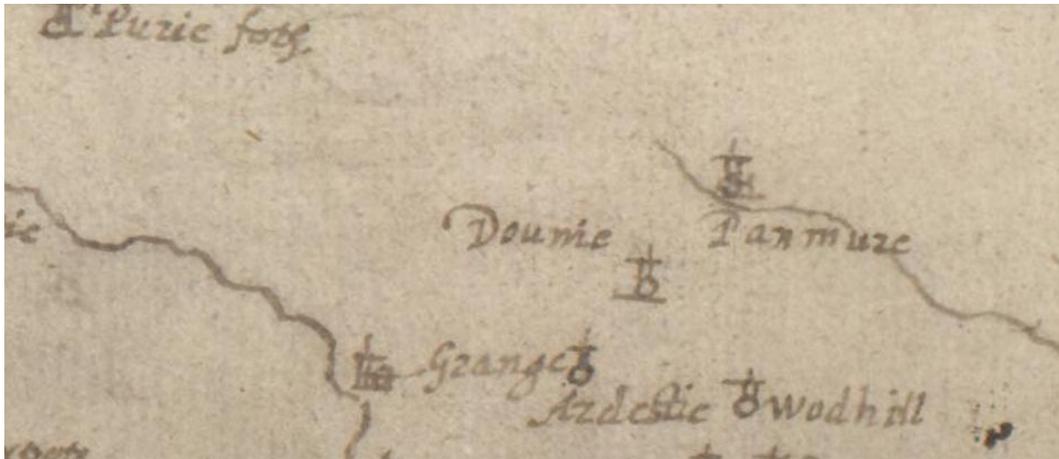
ID: 12 Canmore ID: 34543 NGR: NO53NW 21	Name: Downie Alternatives: Douny, Douney, Dounney	Latitude: 56.5178670487 Longitude: -2.78277025611 (WGS84)
Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXVII.13 (Combined) – (1865) O.S. Sheet 50 – Forfar (1961)	Archaeological References:	Documentary References: Manuscript: GD45/16/1960-2014 GD45/18 GD45/28/14 Printed Manuscripts: RMS, vol ii, no. 3655. RMS, vol iii, no. 1327.
Secondary Sources: Books: Jervise, History and Traditions, 306. Ordnance Survey Name Book, Book 71, 80. Warden, Vol 4, 421.	Articles:	Attribute Terms Used: Structural: Manor-house Landscape Features Capital Messuage Mill Orchard Garden Fishing



**Downie Castle Site Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



Downie Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁷⁰



Downie Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁷¹

⁷⁰ Image covers approximately 27km².

⁷¹ Image covers approximately 6km².



Downie Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁷⁵



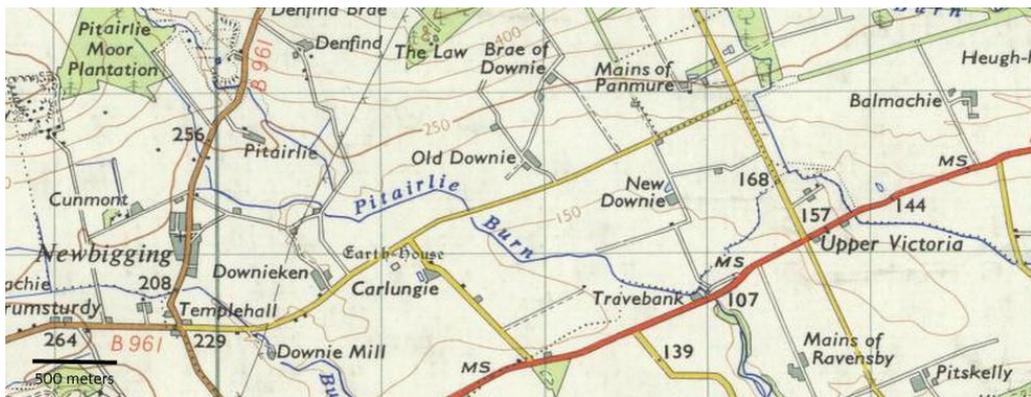
Downie Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁷⁶

⁷⁵ Image covers approximately 12km².

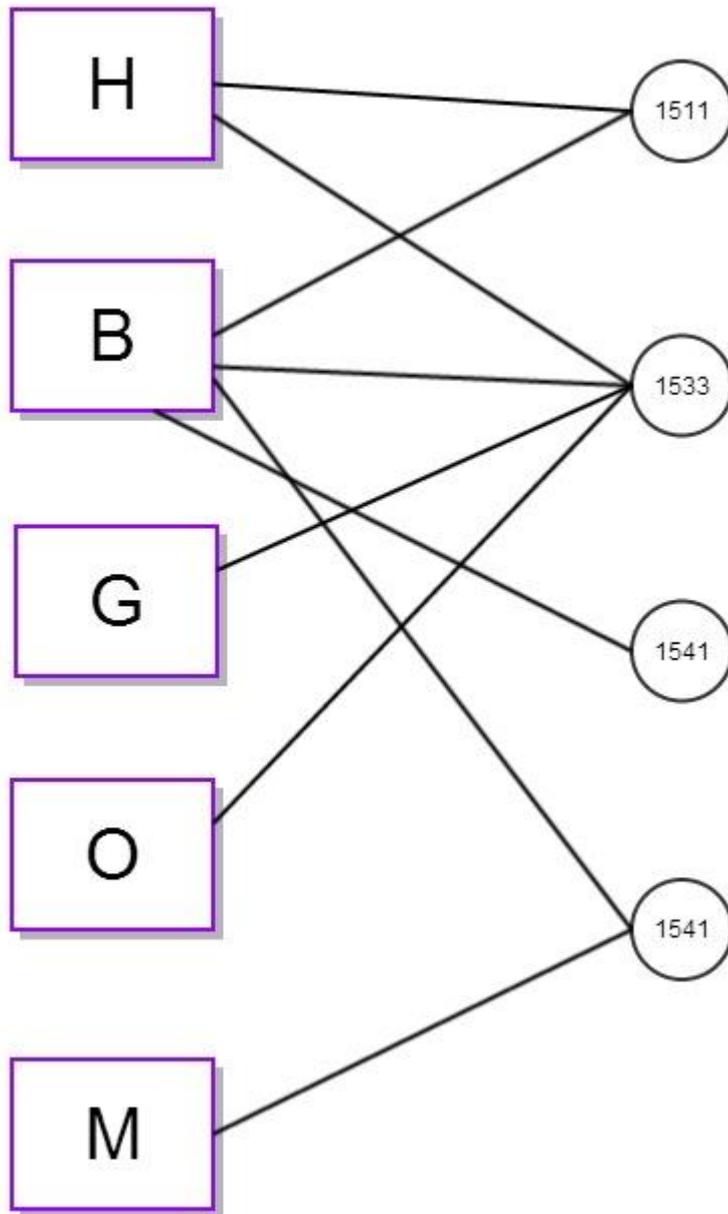
⁷⁶ Image covers approximately 22km².



Downie Castle Depicted in O.S. Forfarshire Sheet LI, 1865; Reproduced by permission of the National Library of Scotland



Downie Castle Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland



Graph of the Attribute Features of Downie Castle; Copyright Kate Buchanan

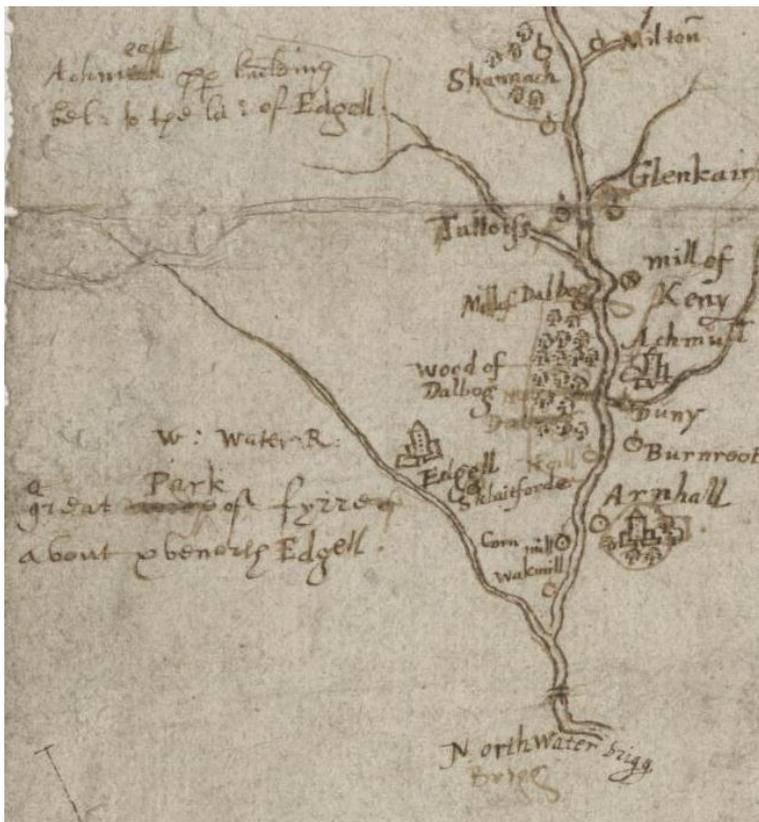
ID: 13 Canmore ID: 34996 NGR: NO 58461 69108	Name: Edzell Alternatives: Adzell, Adzaile, Adzale, Aidzell, Agzell; Edgaile	Latitude: 56.811580744 Longitude: -02.68201262237 (WGS84)
Geographic References: Maps: Pont 30 (1601) Gordon 44 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. –Forfar Sheet XX.5 (1865) O.S. – Sheet 51 Stonehaven and Brechin (1946)	Archaeological References: MacGibbon and Ross, Vol 1, 359-366. Tranter, vol 4, 114 Simpson, PSAS, 1931, 115-173. Jervise, PSAS, 1859, 226-229	Documentary References: Manuscript: GD3/14/2/1/135 GD45/16 GD45/16/1737 GD45/18/1350-1487 GD45/18/1505-1529 GD45/18/1672-1687 GD45/18/2284 Printed Manuscripts: RMS, vol ii, no. 3627. <i>RMS, vol iii, no. – 1477;</i> 1951; 3066; 3219. <i>RMS, vol iv, no. – 453; 922;</i> 992; 1471.
Secondary Sources: Books: NSA, 11, 622-623. Simpson and Fawcett, 1982.	Articles: Anon, 1855, 212. Weaver, 1912, 859-862	
Property Owners: Historic Scotland		Features in Landscape: Mill Fishings Place



Edzell Castle; Copyright Kate Buchanan



Edzell Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Edzell Castle Depicted in Pont 30, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁷⁷

⁷⁷ Image covers approximately 80km².



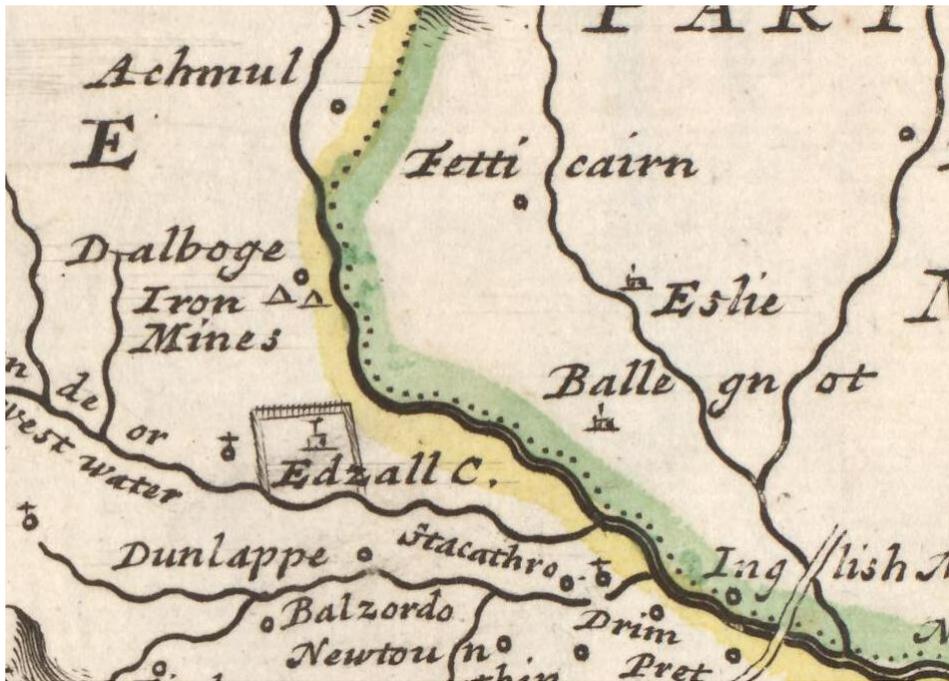
Edzell Castle Depicted in Gordon 44, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁷⁸



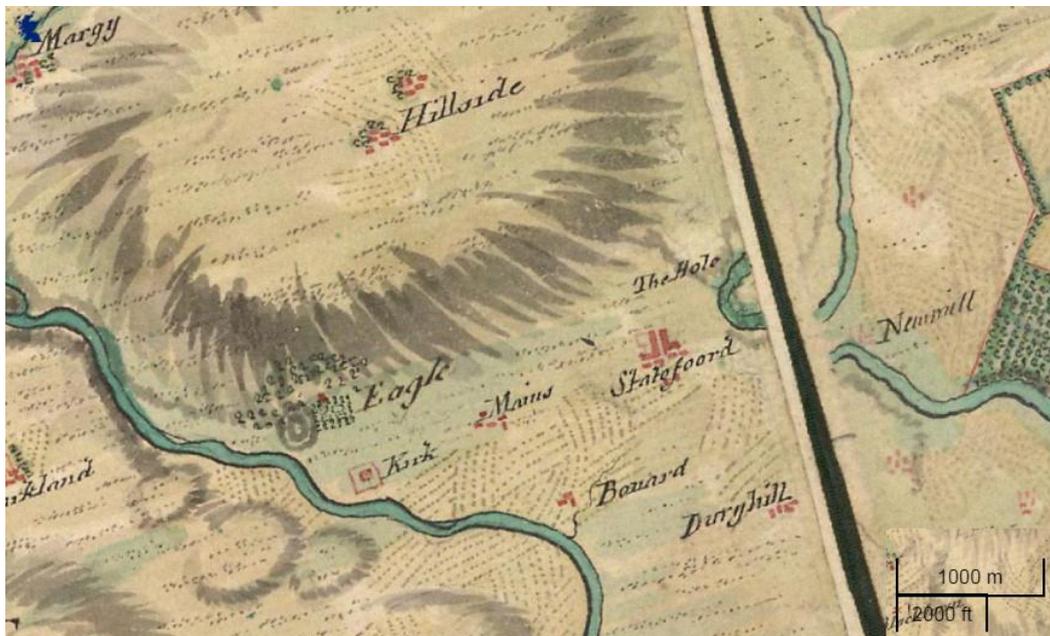
Edzell Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁷⁹

⁷⁸ Image covers approximately 30km².

⁷⁹ Image covers approximately 20km².



Edzell Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁸⁰



Edzell Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

⁸⁰ Image covers approximately 30km².



Edzell Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁸¹

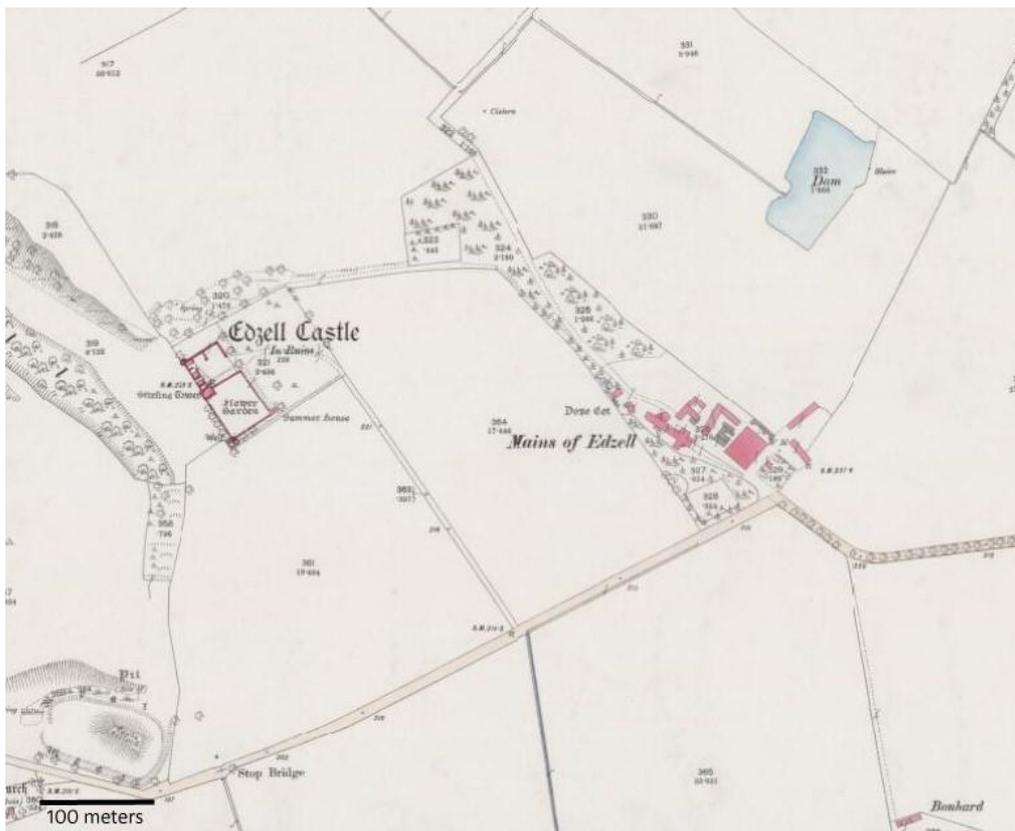


Edzell Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland

⁸¹ Image covers approximately 30km².

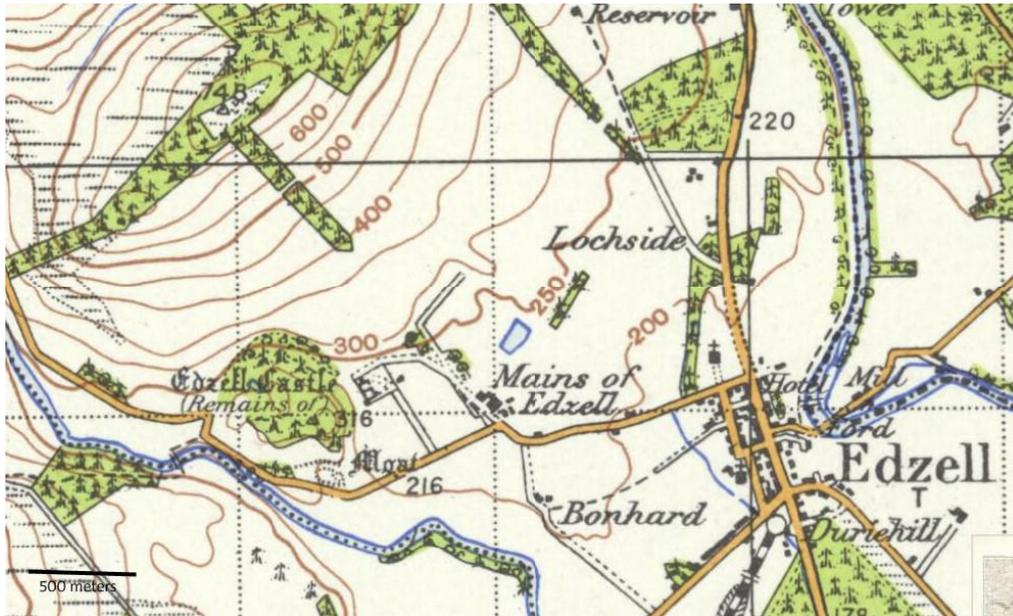


Edzell Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁸²



Edzell Castle Depicted in O.S. Forfar Sheet XX.5 1865; Reproduced by permission of the National Library of Scotland

⁸² Image covers approximately 15km².



**Edzell Castle Depicted in O.S. Sheet 51, Stonehaven & Brechin, 1946;
Reproduced by permission of the National Library of Scotland**

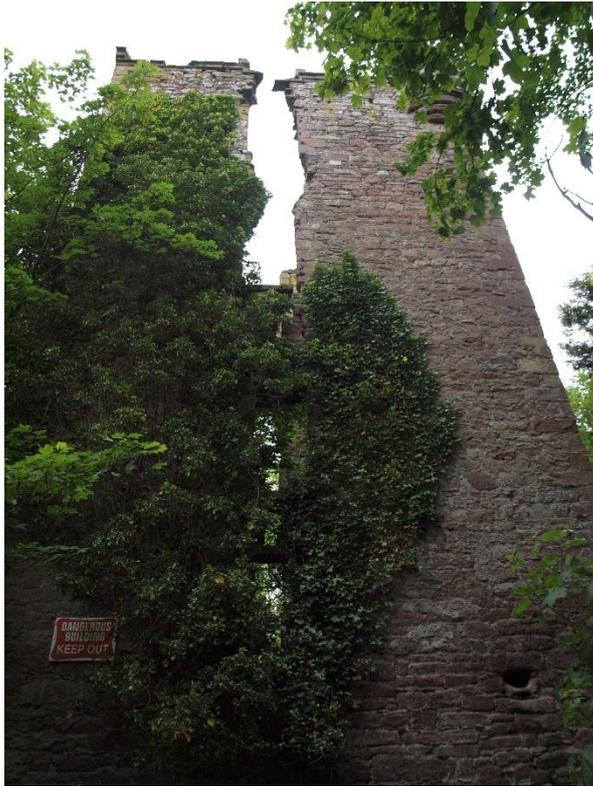
<p>ID: 14 Canmore ID: 33673 NGR: NO 49676 56479</p>	<p>Name: Finavon Alternatives: Finevon, Fynevin, Fynnevyne, Fynnevin, Fynievin, Fynevyue</p>	<p>Latitude: 56.6973510383 Longitude: -02.82329911533 (WGS84)</p>
<p>Geographic References: Maps: Pont 26 (1601) Pont 30 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXXIII.5 (Oathlaw) – (1865) O.S. Forfar Sheet 50 (1961)</p>	<p>Archaeological References: MacGibbon and Ross, Vol. 3, 594-596. Simpson, PSAS, 89, 398- 416. Tranter, Vol 4, 119.</p>	<p>Documentary References: Manuscript: GD16/41/14 GD68/1/6 GD16/41/12 Printed Manuscripts: RMS, vol ii, no. 1191; 1943 <i>RMS, vol iii, no. – 376; 494;</i> 2484; 3231; 494; 1056; 1057; 1249; 1252; 2484; 3231; 1386; 1835 <i>RMS, vol iv, no. – 1353; 1595</i></p>
<p>Secondary Sources: Books:</p>	<p>Articles: PSAS, 1987, 115, p. 449.</p>	
<p>Property Owners: Privately Owned</p>		<p>Attribute Terms Used: Structural: Manor-house Castle Landscape Features: Mill Fishings</p>



Finavon Castle: Copyright Kate Buchanan



Finavon Castle: Copyright Kate Buchanan



Finavon Castle: Copyright Kate Buchanan



**Finavon Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



Finavon Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁸³



Finavon Castle Depicted in Pont 30, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁸⁴

⁸³ Image covers approximately 50km².

⁸⁴ Image covers approximately 20km².



Finavon Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁸⁵



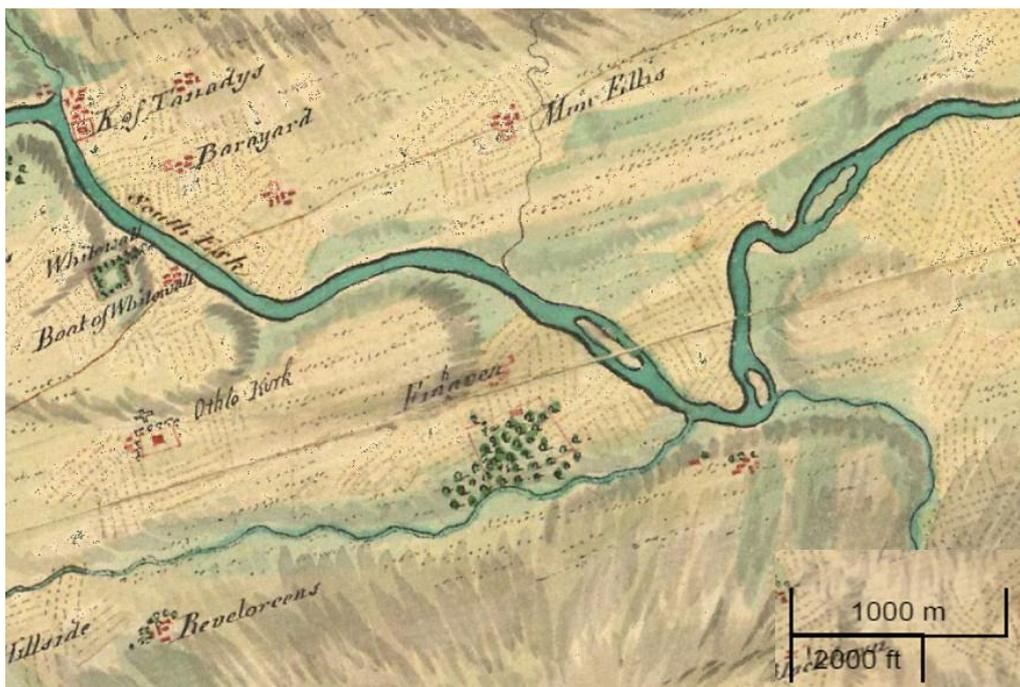
Finavon Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁸⁶

⁸⁵ Image covers approximately 100km².

⁸⁶ Image covers approximately 10km².



Finavon Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁸⁷

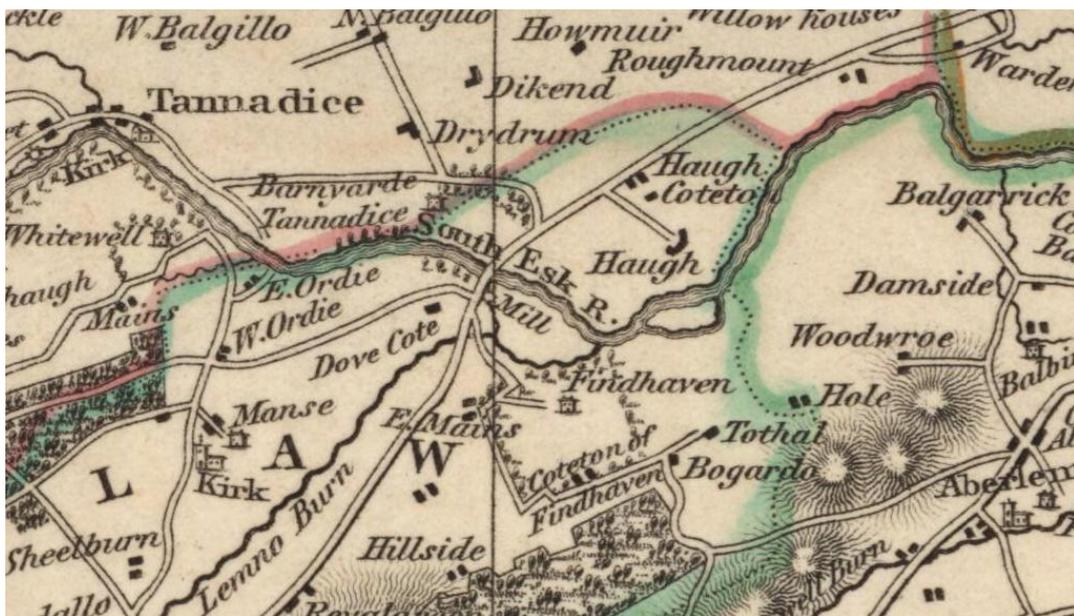


Finavon Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

⁸⁷ Image covers approximately 25km².



Finavon Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁸⁸



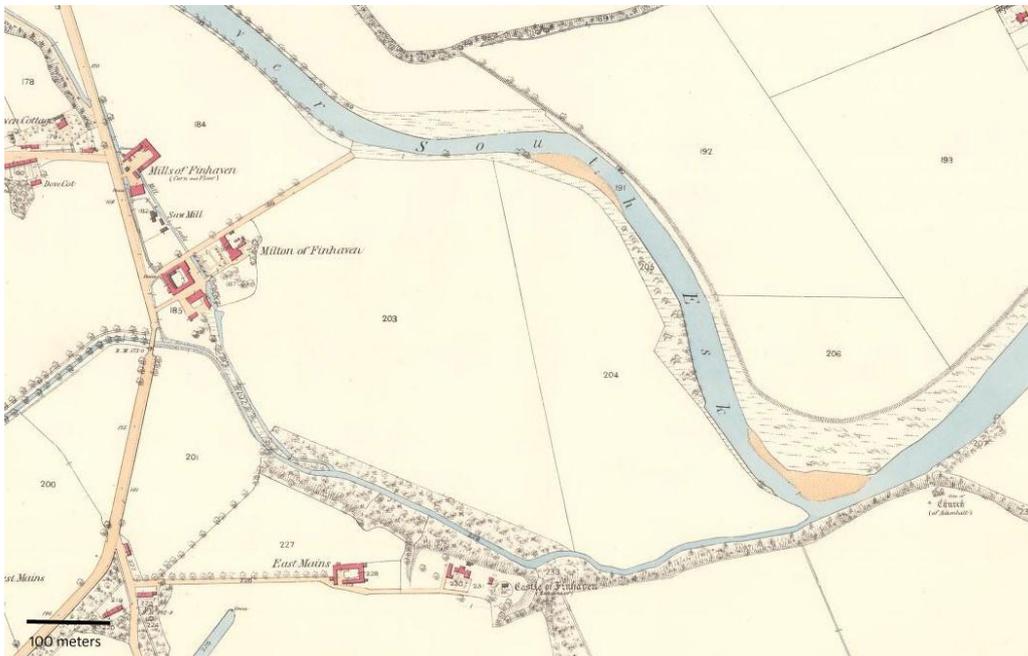
Finavon Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁸⁹

⁸⁸ Image covers approximately 5km².

⁸⁹ Image covers approximately 15km².

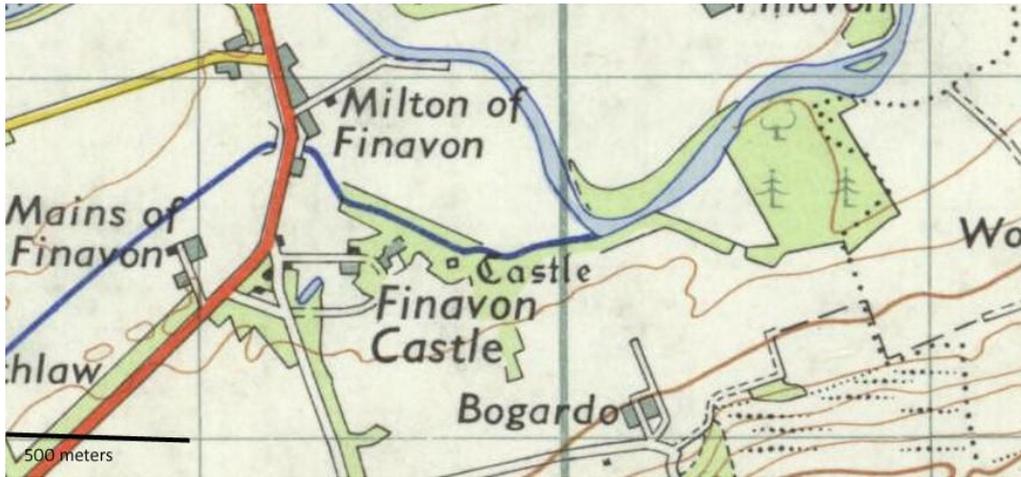


Finavon Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁹⁰

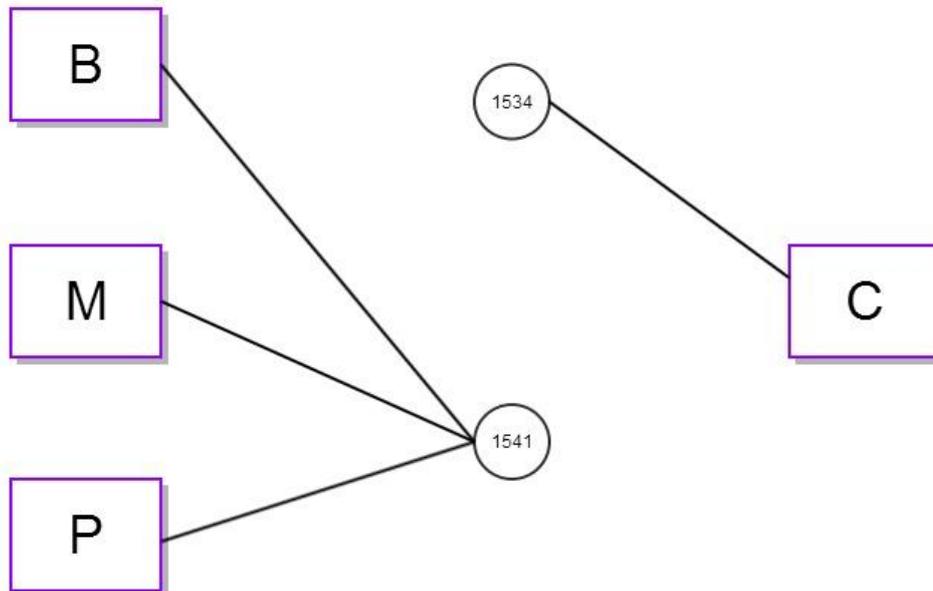


Finavon Castle Depicted in O.S. Forfar Sheet XXXIII.5 (Oathlaw), 1865; Reproduced by permission of the National Library of Scotland

⁹⁰ Image covers approximately 150km².



Finavon Castle Depicted in O.S. Forfar Sheet 50, 1961; Reproduced by permission of the National Library of Scotland



Graph Depicting Attribute Features of Finavon Castle; Copyright Kate Buchanan

ID: 15 Canmore ID: 35861 NGR: NO 6349 5447	Name: Fithie Alternatives: Fethis, Fethys	Latitude: 56.6805453643 Longitude: -2.59751055636 (WGS84)
Geographic References: Maps: Pont 26 (1601) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S .- XXXIV. 11, Farnell, (1865) O.S. –Sheet NO65 & NO75, (1957)	Archaeological References: Architecture:	Documentary References: Manuscript: GD16/24/104 Printed Manuscripts: RMS, vol iii, no. 1988. RMS, vol iii, no. 2094. RMS, vol iii, no. 2810.
Secondary Sources: Books: Jervise, vol 1, 86. Warden, 3, 247. Ordnance Survey, Name Book, Book 41, 45.	Articles or Chapters:	Attribute Terms Used: Structural: Manor-house Fortalice Landscape Features Fishing Mill

Table of Coordinates Used for Creating Fithie Map:

ID	Latitude	Longitude
Fithie	56.68055	-2.59751
Fithie Fishings 1	56.68408	-2.59314
Fithie Fishings 2	56.68307	-2.61874
Fithie Fishings 3	56.68867	-2.60998
Fithie Fishings 4	56.69095	-2.59921
Fithie Fishings 5	56.69196	-2.59364
Fithie Mill	56.68249	-2.61755



Fithie Castle Site Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Fithie Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland⁹¹

⁹¹ Image covers approximately 30km².



Fithie Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland⁹²



Fithie Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

⁹² Image covers approximately 70km².



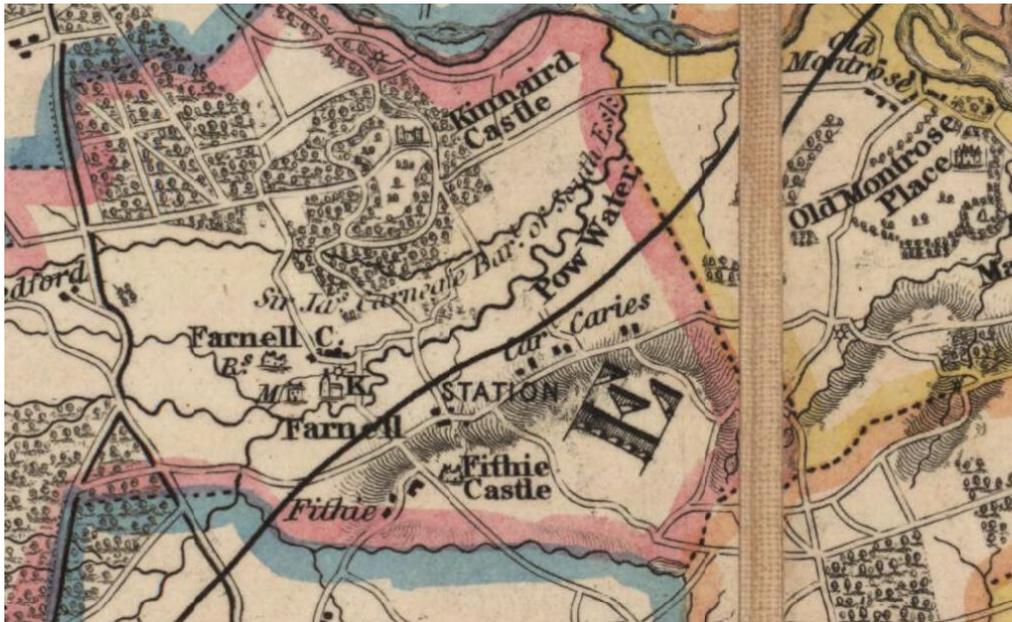
Fithie Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland⁹³



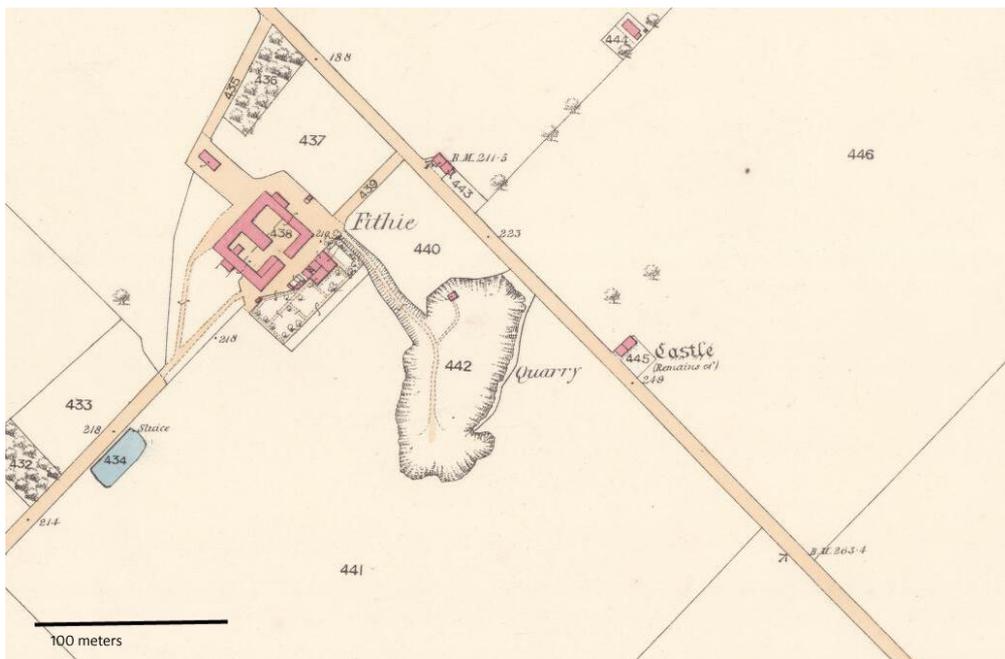
Fithie Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland⁹⁴

⁹³ Image covers approximately 30km².

⁹⁴ Image covers approximately 18km².

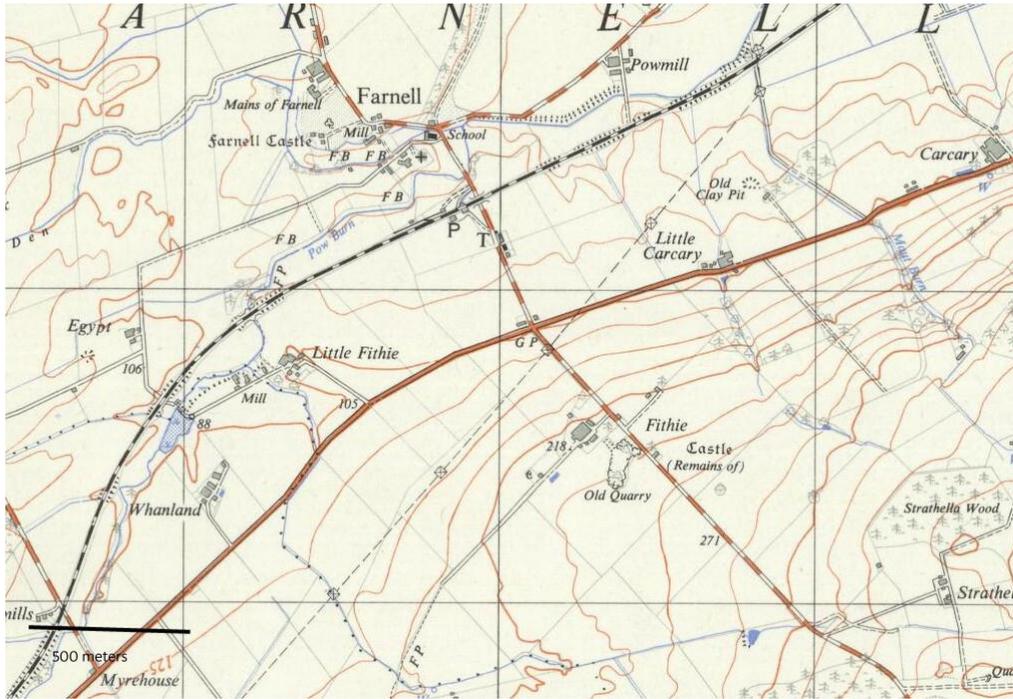


Fithie Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland⁹⁵

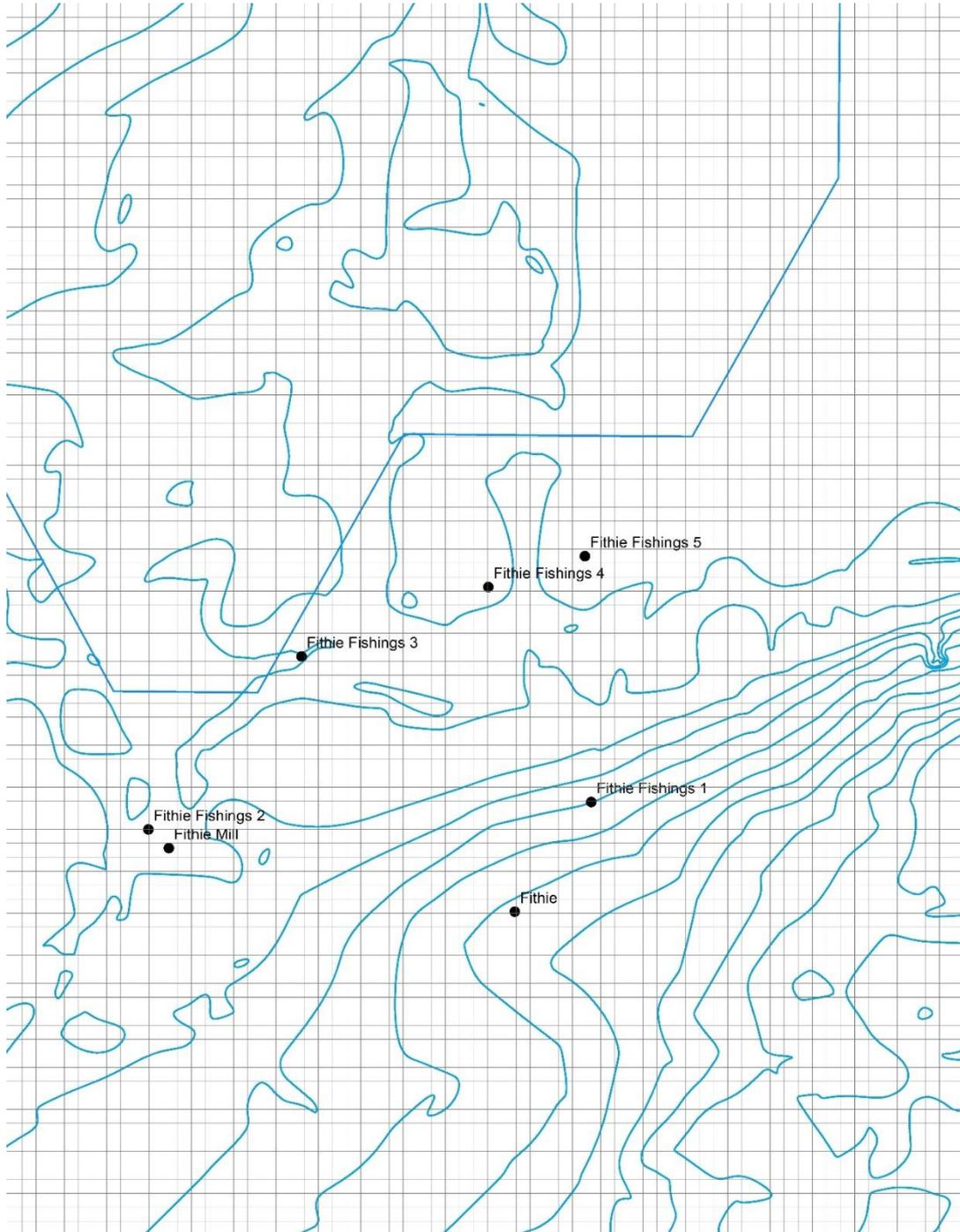


Fithie Castle Depicted in O.S. Forfar Sheet, XXXIV. 11 (Farnell) 1865; Reproduced by permission of the National Library of Scotland

⁹⁵ Image covers approximately 30km².

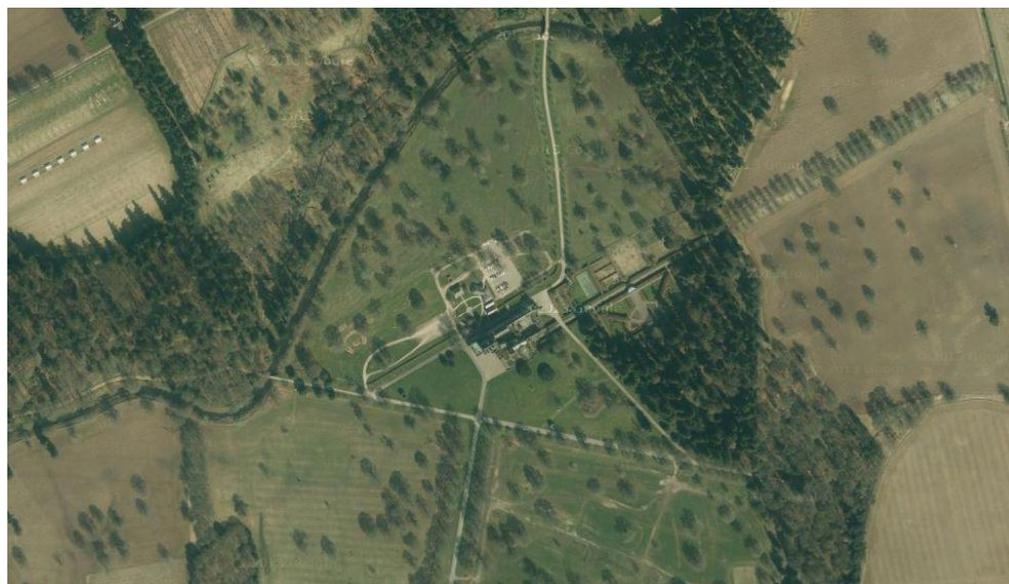


Fithie Castle Depicted in O.S. Sheet NO65 & NO75, (1957); Reproduced by permission of the National Library of Scotland



Map of Fithie Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

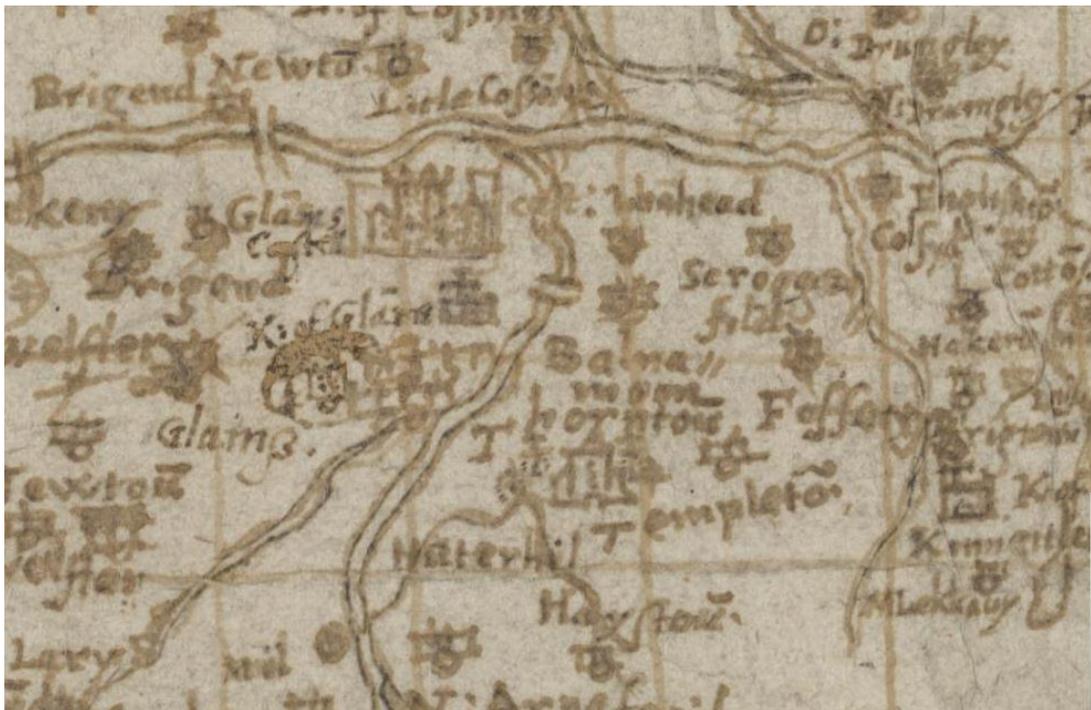
ID: 16 Canmore ID: 32055 NGR: NO 38586 48054	Name: Glamis Alternatives: Glammiss, Glammys	Latitude: 56.620311 Longitude: -03.002248 (WGS84)
Geographic References: Maps: Pont 26 (1601) Pont 29 (1601) Gordon 41 (1652) Gordon 42 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. Sheet 56 (Blairgowrie) – (1870) O.S. Sheet 57, Forfar and Dundee (1927)	Archaeological References: MacGibbon and Ross, vol 2, 113-125.	Documentary References: Manuscript: GD52/1564 GD3/1/1/63/5 GD17/16 GD52/1564 GD246/76/4 Printed Manuscripts: RMS, vol ii, no. 2223; 2610; 2158; 2064; 2158; 2218; 2223; 3583. <i>RMS, vol iii, no. – 291; 2233; 2201; 2202; 2212; 2493; 2593-95; 2696; 2233; 2372; 2619; 2372.</i> <i>RMS, vol iv, no. – 294; 3008; 3009; 1793; 1792.</i>
Secondary Sources: Books: Slade, 2000 Billing, vol 2, 56.	Articles: Carhart, 2002, D.E.S., 12. Apted, 1985, PSAS, 114, 595. Apted, 1986, Antiq. J., 66, 91-115.	Attribute Terms Used: Structural: Castle Landscape Features: Mill Fishings



Glamis Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



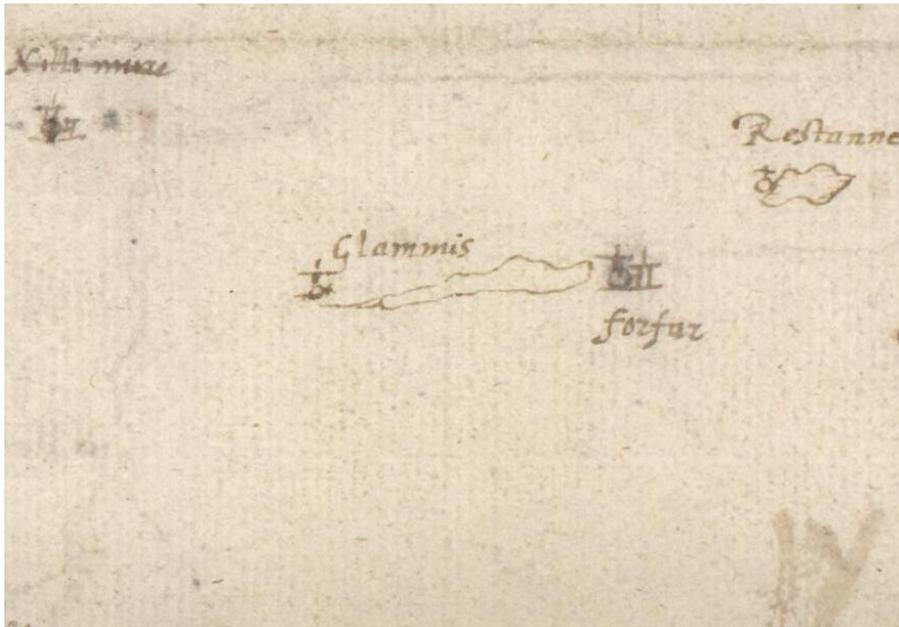
Glamis Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁹⁶



Glamis Castle Depicted in Pont 29, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland⁹⁷

⁹⁶ Image covers approximately 50km².

⁹⁷ Image covers approximately 55km².



Glamis Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁹⁸



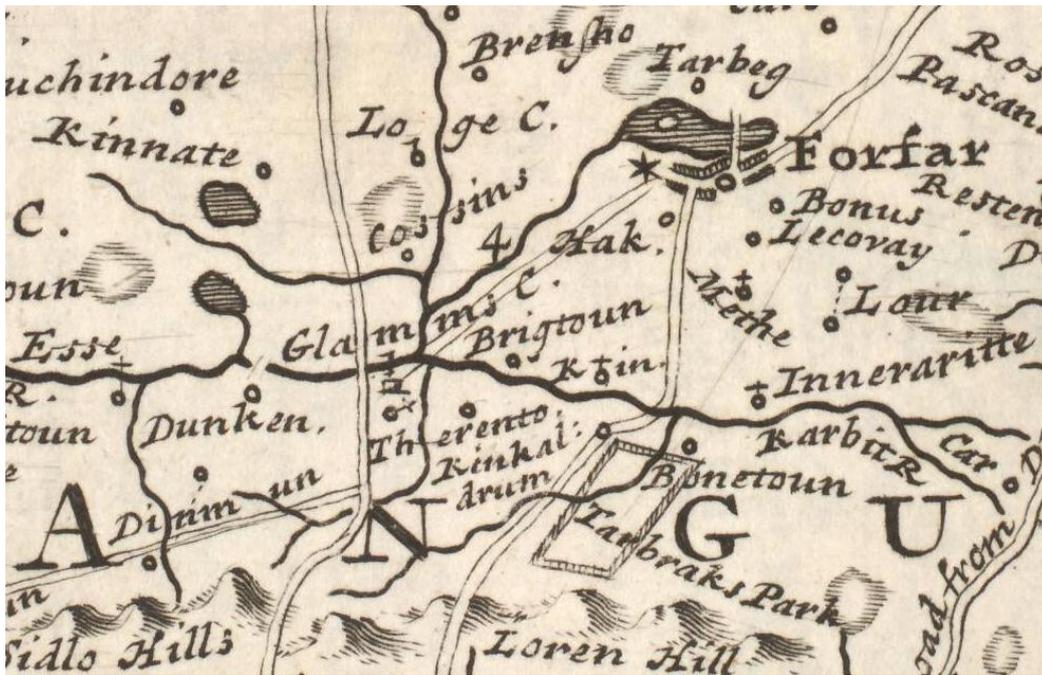
Glamis Castle Depicted in Gordon 42, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland⁹⁹

⁹⁸ Image covers approximately 100km².

⁹⁹ Image covers approximately 50km².



Glamis Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹⁰⁰



Glamis Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹⁰¹

¹⁰⁰ Image covers approximately 45km².

¹⁰¹ Image covers approximately 100km².



Glamis Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹⁰³



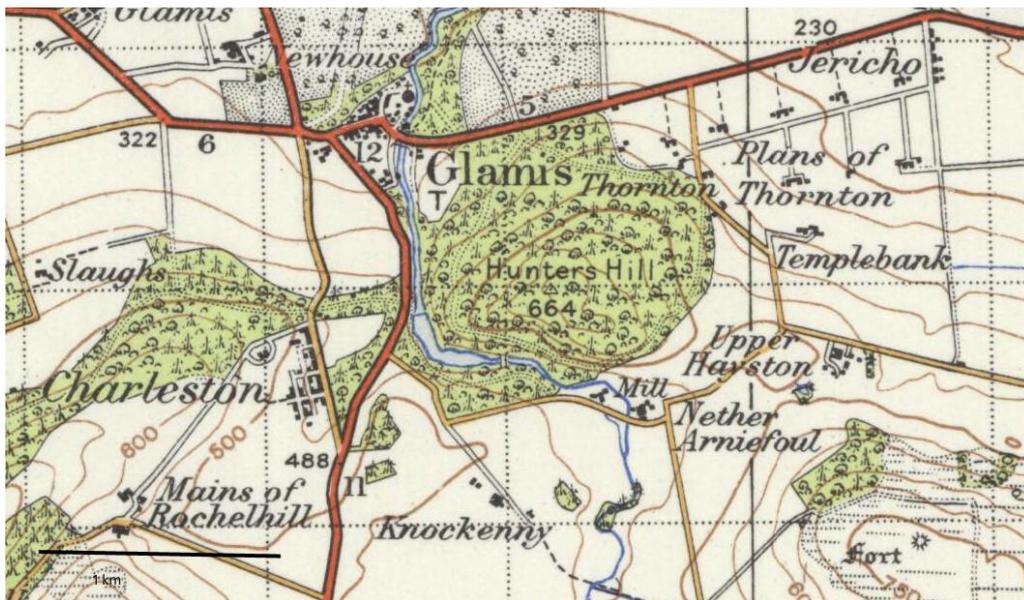
Glamis Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹⁰⁴

¹⁰³ Image covers approximately 30km².

¹⁰⁴ Image covers approximately 40km².

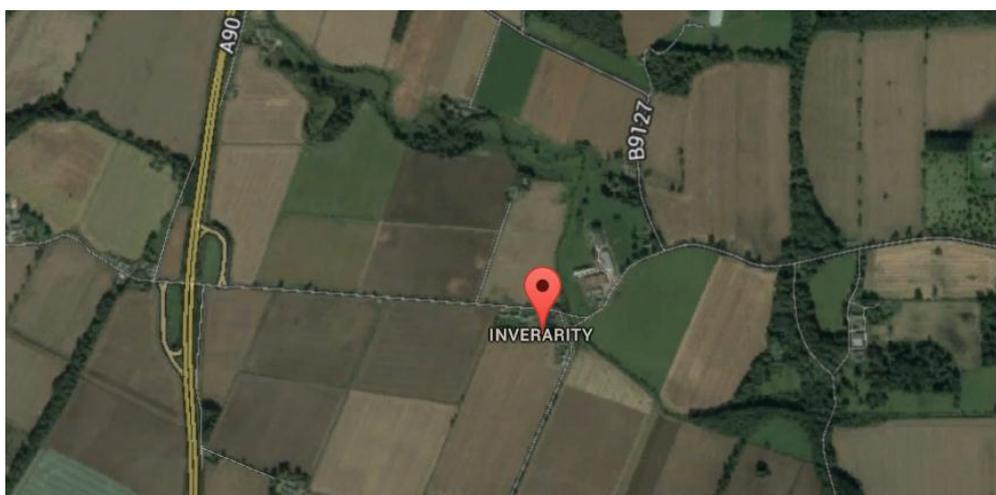


Glamis Castle Depicted in O.S. Sheet 56, Blairgowrie, 1870; Reproduced by permission of the National Library of Scotland



Glamis Castle Depicted in O.S. Sheet 57, Forfar and Dundee, 1927; Reproduced by permission of the National Library of Scotland

ID: 17 Canmore ID: 223860 NGR: NO 45207 44512	Name: Inverarity Alternatives: Inverarite, Inveraridy, Invereridy	Latitude: 56.5855585783 Longitude: -2.88270252539 (WGS84)
Geographic References: Maps: Pont 26 (1601) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar SheetXLIV– (1865) O.S. – Sheet 50, Forfar (1961)	Archaeological References: Architecture:	Documentary References: Manuscript: GD56/19 GD121/3/2 GD121/3/3 GD121/3/5 GD121/3/7 GD121/3/8 GD121/3/10 GD121/3/12 GD121/3/15 GD121/3/34 Printed Manuscripts: RMS, vol ii, no. 1038; 1938; 2874; 3861; 768; 776; 1169; 1497; 1922; 1938; 3861; 1938. RMS, vol iii, no. – 414; 447; 494; 2453; 2484; 3231; 141; 447; 494; 1336; 1489; 1936; 1942; 2453; 2484; 2707; 3050; 3219; 3231. RMS, vol iv, no. – 1353; 1595; 1892; 1741.
Secondary Sources: Books:	Articles or Chapters:	Attribute Terms Used: Structural: Manor-house Landscape Features: Mill Park Woodland



**Inverarity Site Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



Inverarity Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland¹⁰⁵



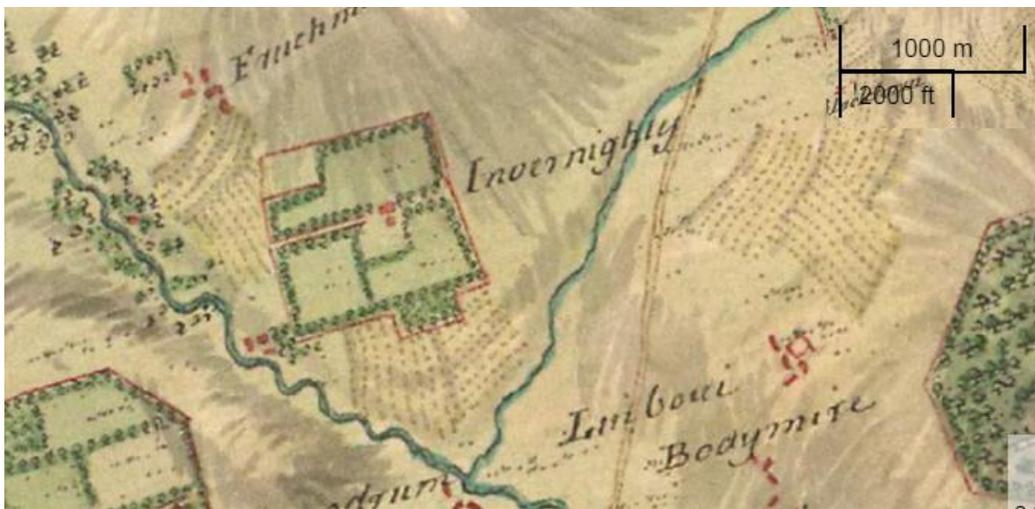
Inverarity Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹⁰⁶

¹⁰⁵ Image covers approximately 6km².

¹⁰⁶ Image covers approximately 7km².



Inverarity Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹⁰⁷



Inverarity Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

¹⁰⁷ Image covers approximately 145km².



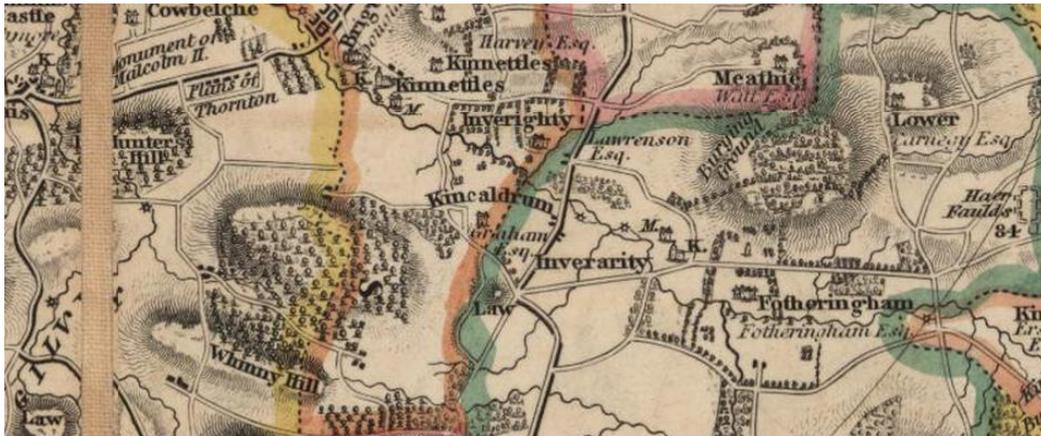
Inverarity Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹⁰⁸



Inverarity Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹⁰⁹

¹⁰⁸ Image covers approximately 15km².

¹⁰⁹ Image covers approximately 20km².

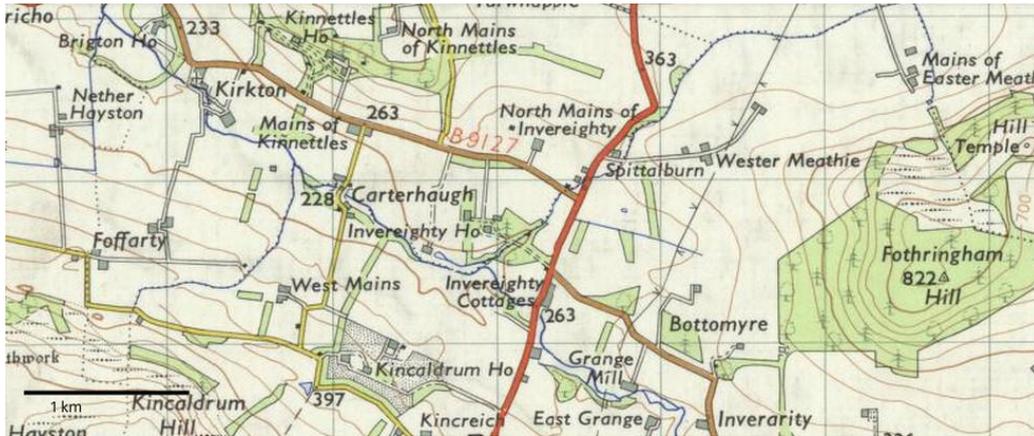


Inverarity Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹¹⁰

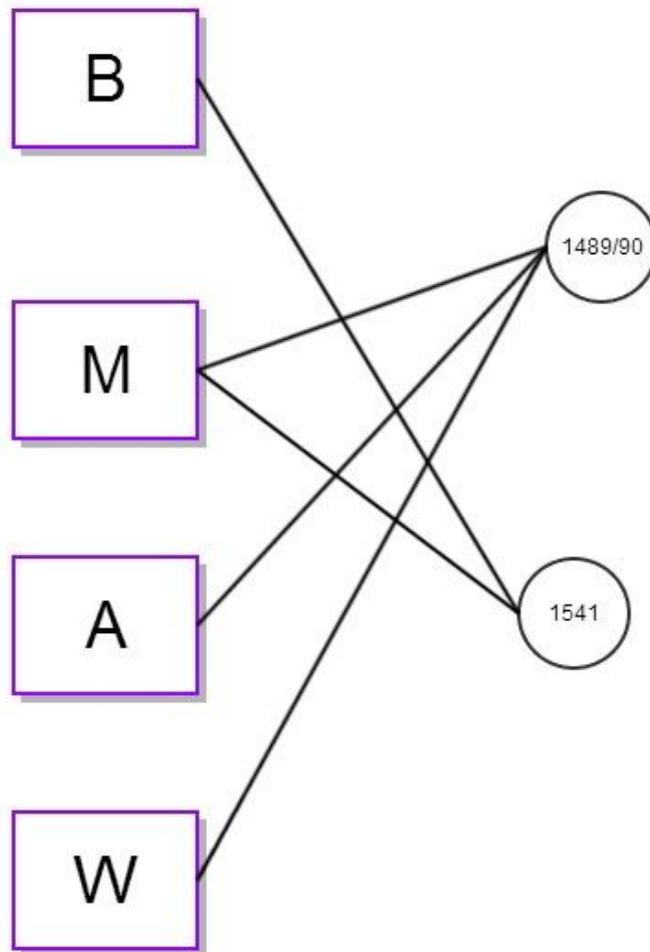


Inverarity Depicted in O.S. Forfarshire XLIV, 1865; Reproduced by permission of the National Library of Scotland

¹¹⁰ Image covers approximately 30km².



Inverarity Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland



Graph of the Attribute Features of Inverarity; Copyright Kate Buchanan

<p>ID: 18 Canmore ID: 33734 NGR: NO 41120 57953</p>	<p>Name: Inverquharity Alternatives: Inverquarite, Inverquharady, Inverquhareddy, Inverquharidy</p>	<p>Latitude: 56.709526652 Longitude: -02.96330875801 (WGS84)</p>
<p>Geographic References: Maps: Pont 29 (1601) Gordon 42 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XXXIL.1 (Kirriemuir) – (1865) O.S. – Forfar Sheet 50 (1961)</p>	<p>Archaeological References: MacGibbon and Ross, Vol. 3, 282-285. Tranter, Vol. 4, 132-134.</p>	<p>Documentary References: Manuscript: GD45/16/3025-3035 GD50/156A GD205 GD205/3/1 GD205/3/2 GD205/3/3 GD205/5/9 GD205/18/62 Printed Manuscripts: RMS, vol ii, no. 1550; 3489. <i>RMS, vol iii, no. – 2601.</i></p>
<p>Secondary Sources: Books: Warden, Vol. 4, 105-106. Jervise, Memorials, p. 17</p>	<p>Articles:</p>	<p>Attribute Terms Used: Structural: Castle Fortalice Landscape Features Mill Fishing</p>



Inverquhar Castle; Copyright Kate Buchanan



Inverquhar Castle; Copyright Richard D. Oram



Inverquhar Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014

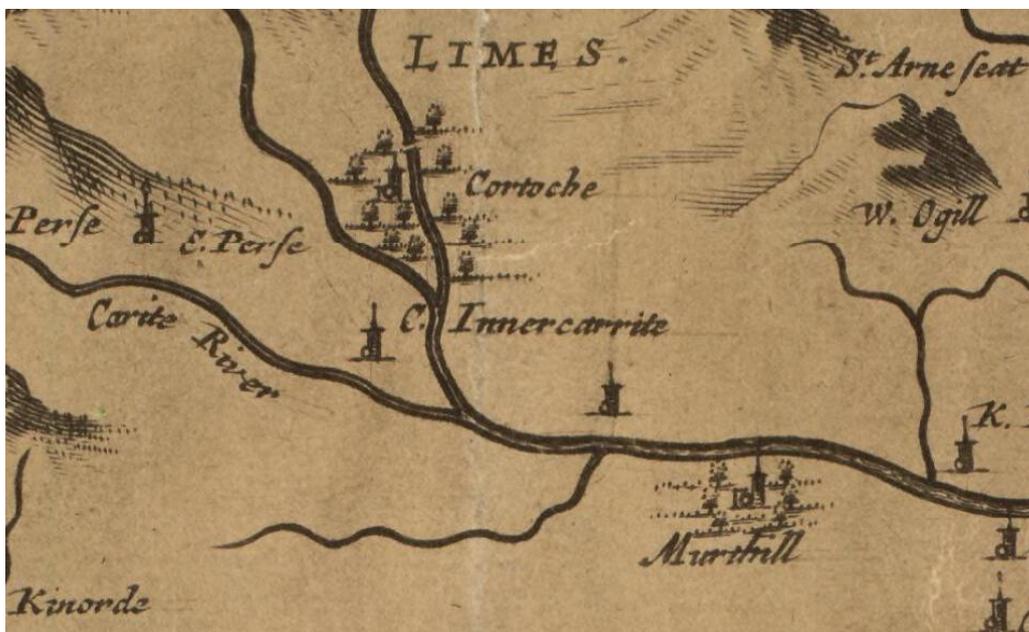


Inverquhar Castle Depicted in Pont 29, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland¹¹¹

¹¹¹ Image covers approximately 3km².



Inverquharity Castle Depicted in Gordon 42, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹¹²



Inverquharity Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹¹³

¹¹² Image covers approximately 15km².

¹¹³ Image covers approximately 30km².



Inverquharity Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹¹⁴



Inverquharity Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

¹¹⁴ Image covers approximately 45km².



Inverquharie Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹¹⁵



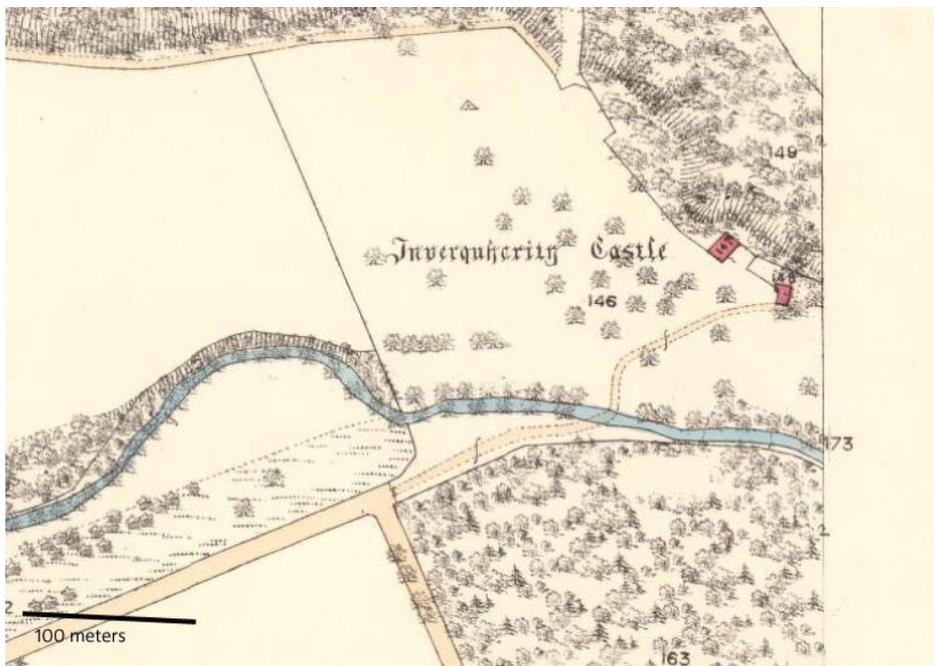
Inverquharie Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹¹⁶

¹¹⁵ Image covers approximately 10km².

¹¹⁶ Image covers approximately 7km².

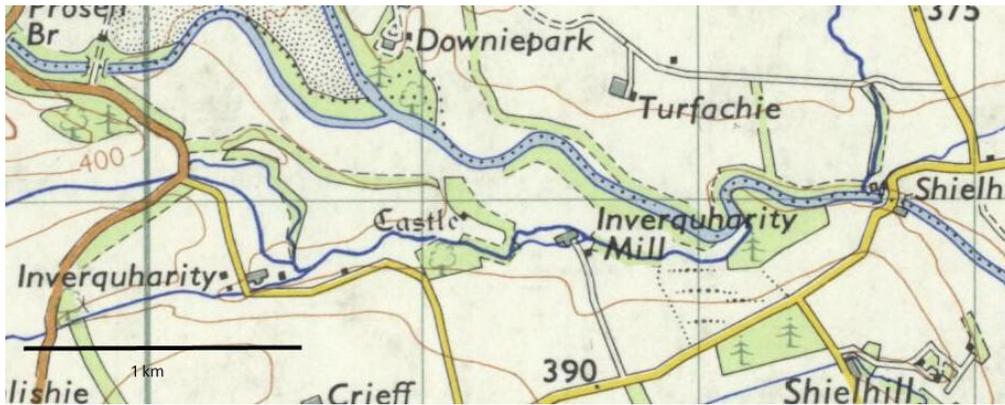


Inverquharie Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹¹⁷

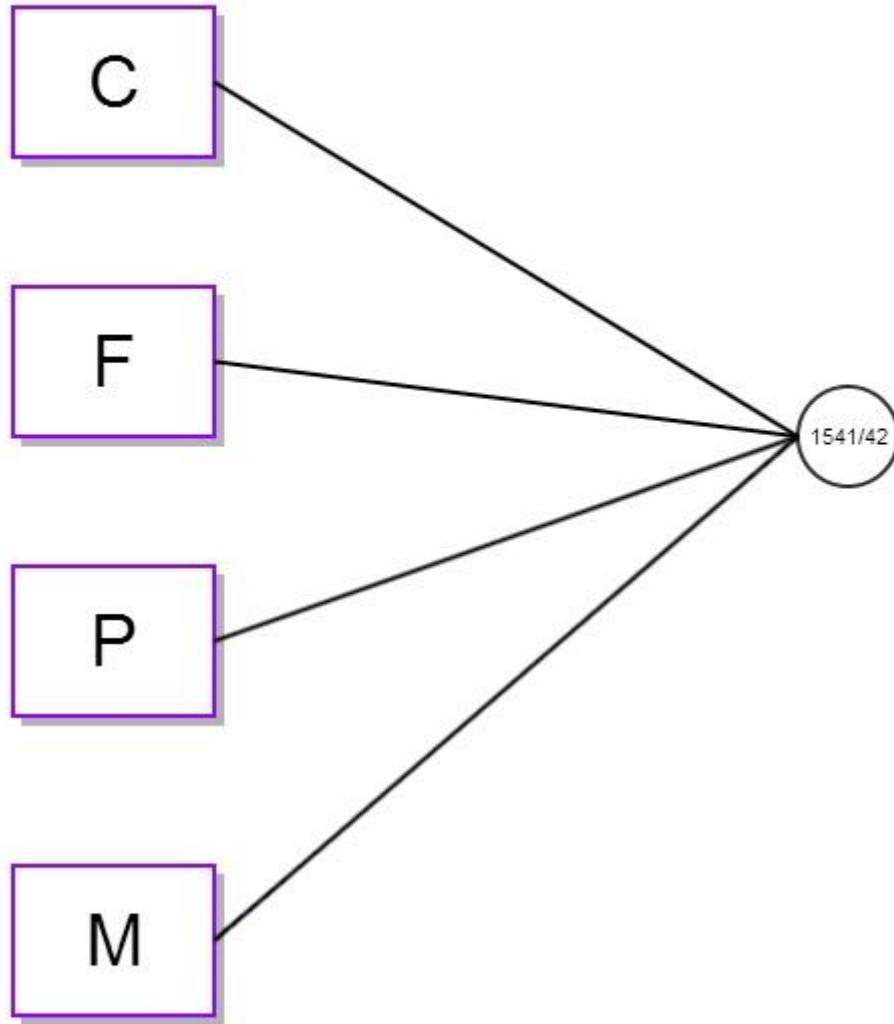


Inverquharie Castle Depicted in O.S. Forfar Sheet XXXIL.1 (Kirriemuir) 1865; Reproduced by permission of the National Library of Scotland

¹¹⁷ Image covers approximately 15km².



Inverquharity Castle Depicted in O.S. Forfar Sheet 50, 1961; Reproduced by permission of the National Library of Scotland



Graph of Attributed Terms Used in Inverquharity Castle; Copyright Kate Buchanan

ID: 19 Canmore ID: 34798 NGR: NO 54609 56330	Name: Melgund Alternatives: Melgound, Melgem	Latitude: 56.6965002805 Longitude: -02.74284433295 (WGS84)
Geographic References: Maps: Pont 26 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S.- Frowarshire Sheet XXXIII.7 (Aberlemno) - (1865) O.S. – Sheet 57 – Forfar and Dundee (1927)	Archaeological References: Architecture: MacGibbon and Ross: Vol.4, 311-316. Tranter, vol 4, 139.	Documentary References: Manuscript: Printed Manuscripts: <i>RMS, vol iii, no. – 897; 2574;</i> <i>3138; 337; 897; 2574; 2788;</i> <i>3095; 2192; 2574; 3095; 3108;</i> <i>3138; 3150.</i> <i>RMS, vol iv, no. – 3008; 3009.</i>
Secondary Sources: Books: Cumming, 1848. Fawcett and Rutherford, 2011.	Articles or Chapters: Carhart, 1990, D.E.S., 40 Lewis, 1990, D.E.S., 40. Lewis, 1991, D.E.S., 71. Lewis, 1994, D.E.S., 80. Lewis, 1996, D.E.S., 10. Lewis, 2004, Tayside and Fifie, 10, 135-152.	Attribute Terms Used: Structural: Manor Landscape Features: Mill Fishings

Table of Coordinates Used for Creating Melgund Map:

ID	Latitude	Longitude
Melgund	56.6965	-2.74284
Melgund Fishings 1	56.70692	-2.73831
Melgund Fishings 2	56.70974	-2.74226
Melgund Fishings 3	56.71496	-2.75311
Melgund Fishings 4	56.71164	-2.76111
Melgund Fishings 5	56.71436	-2.74522
Melgund Mill	56.70469	-2.73631



Melgund Castle; Copyright Kate Buchanan



**Melgund Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



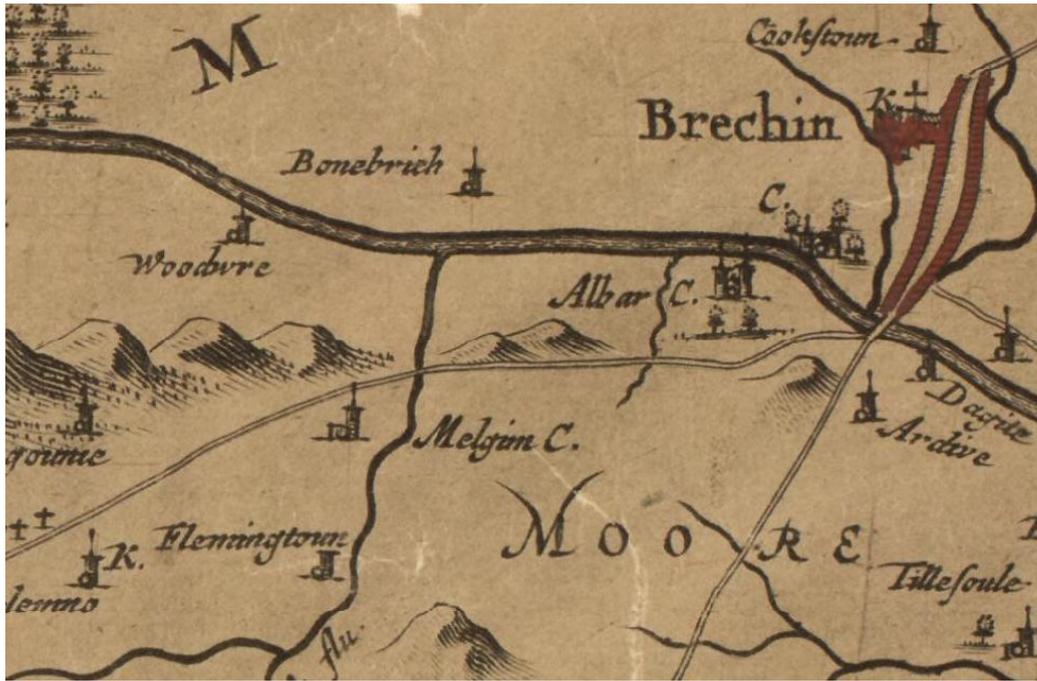
Melgund Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by permission of the National Library of Scotland¹¹⁸



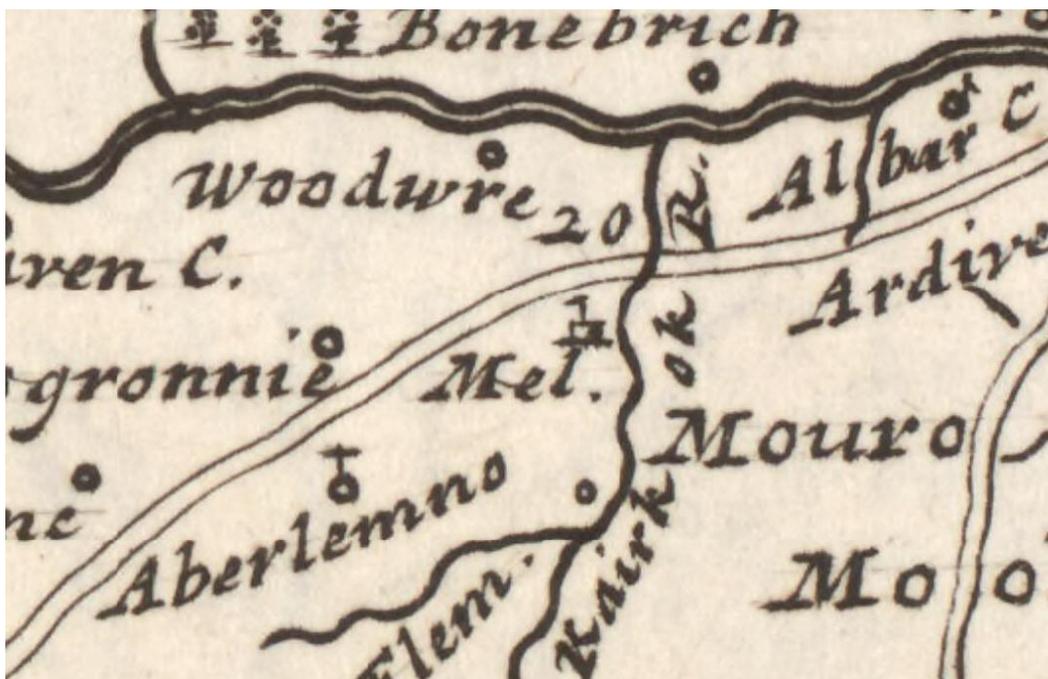
Melgund Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹¹⁹

¹¹⁸ Image covers approximately 10km².

¹¹⁹ Image covers approximately 100km².



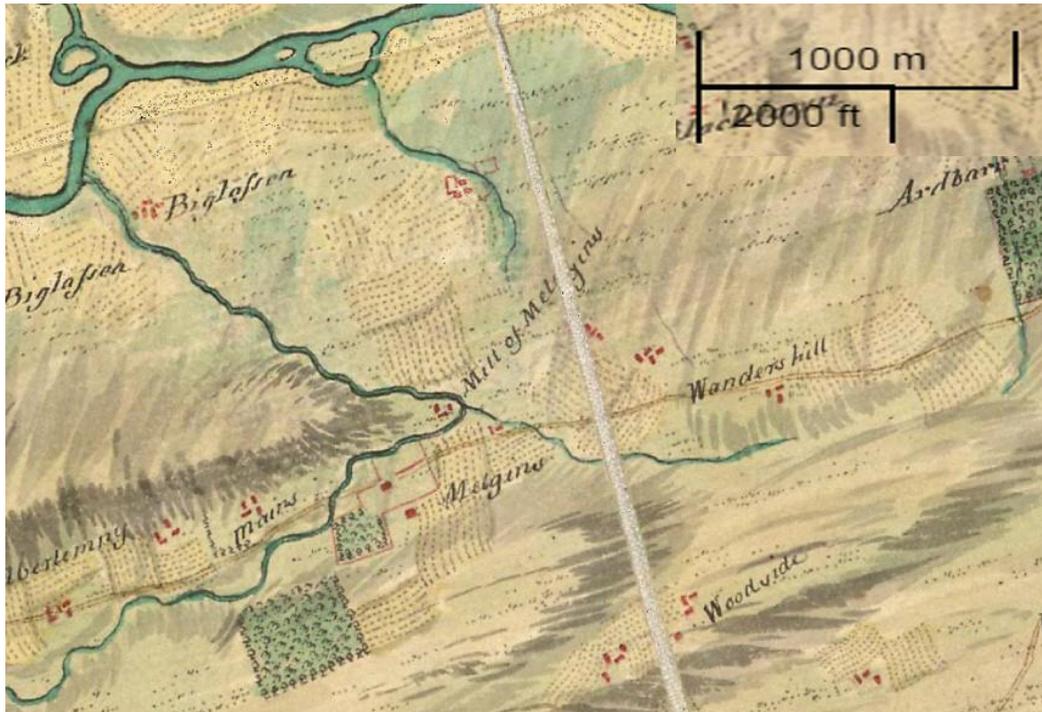
Melgund Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹²⁰



Melgund Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹²¹

¹²⁰ Image covers approximately 60km².

¹²¹ Image covers approximately 15km².



Melgund Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

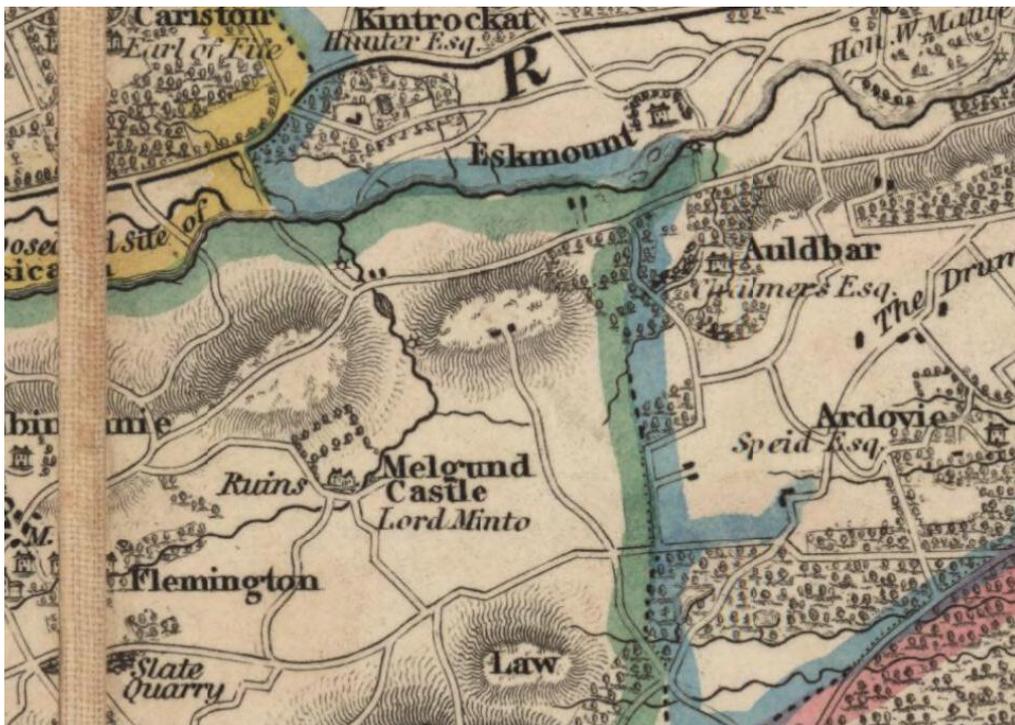


Melgund Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹²²

¹²² Image covers approximately 30km².



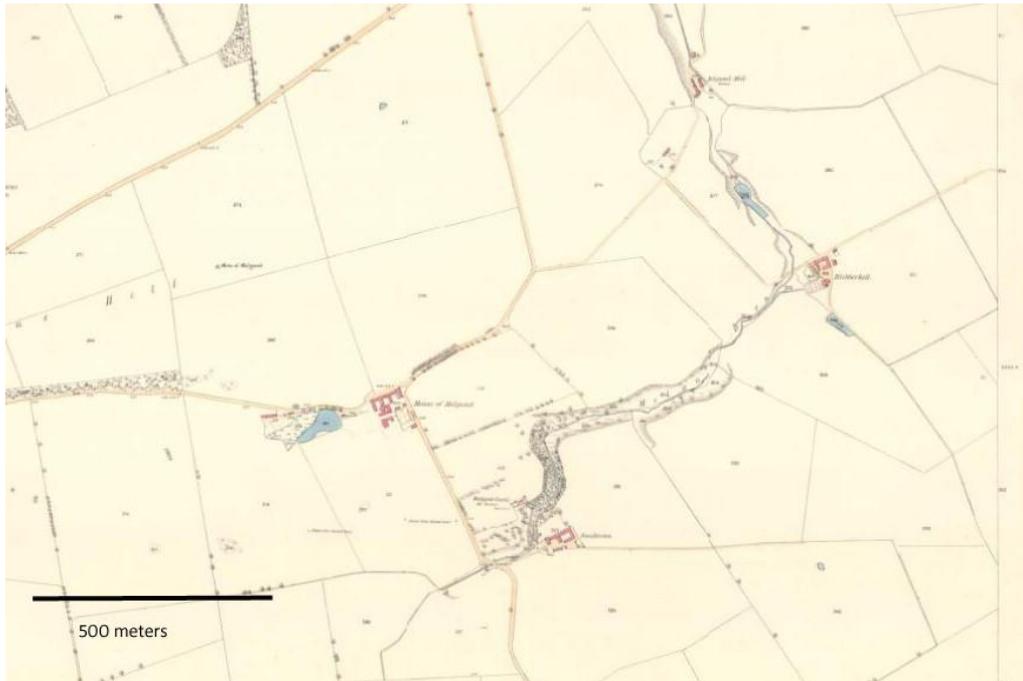
Melgund Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹²³



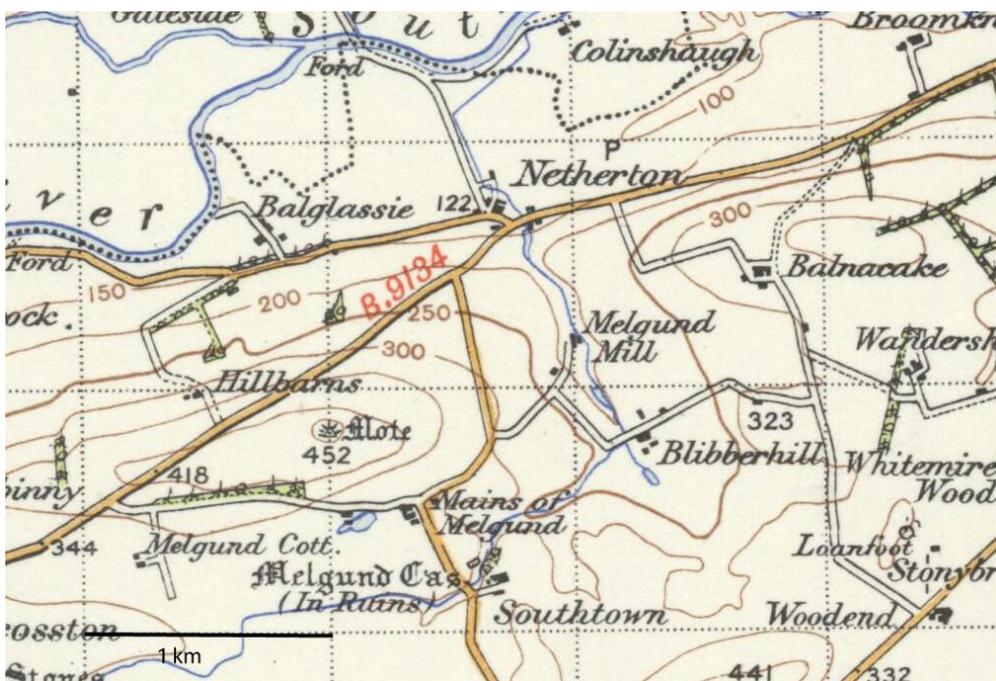
Melgund Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹²⁴

¹²³ Image covers approximately 20km².

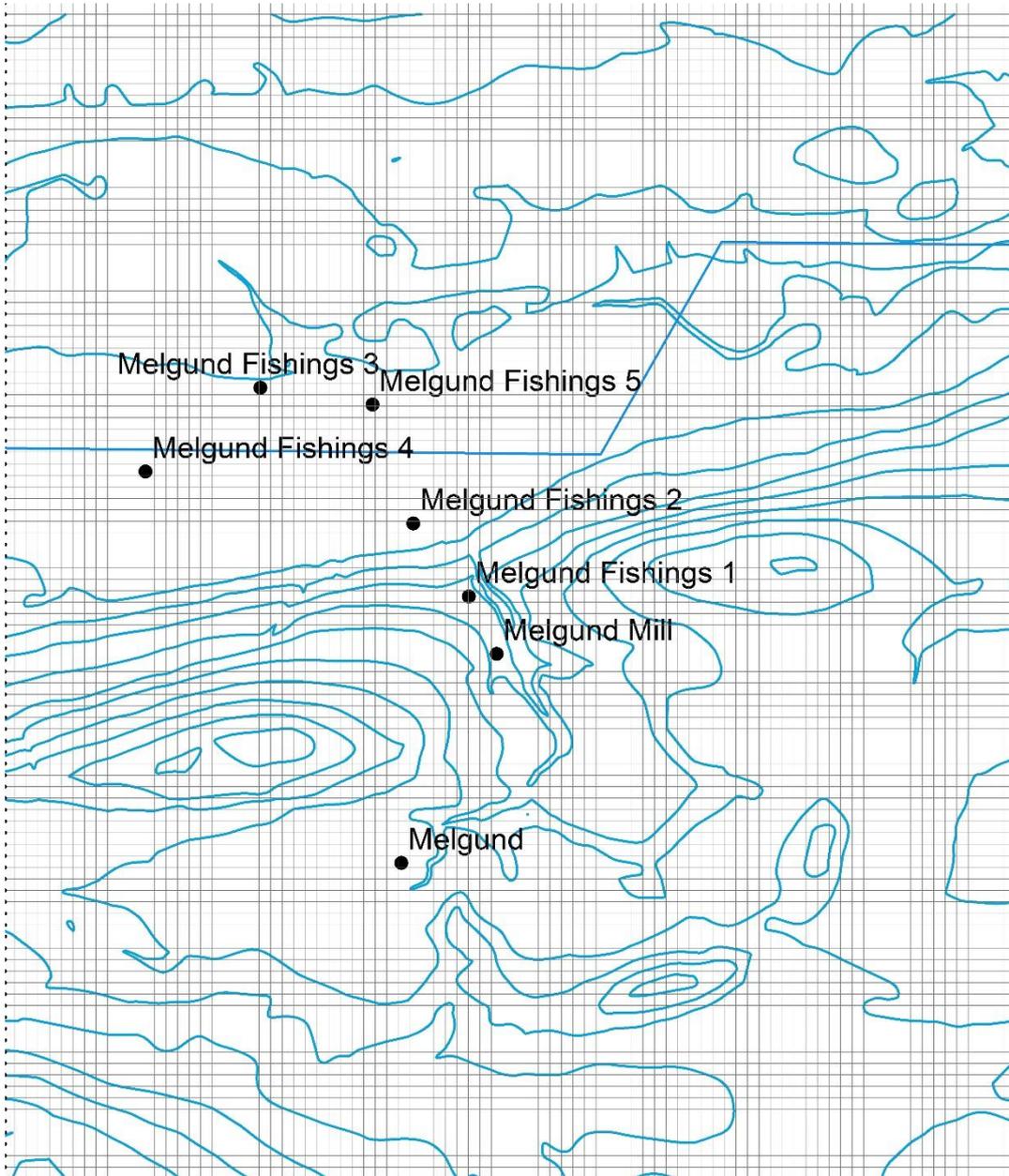
¹²⁴ Image covers approximately 35km².



**Melgund Castle Depicted in O.S. Forfar Sheet XXXIII.7 (Aberlemno) 1865;
Reproduced by permission of the National Library of Scotland**



**Melgund Castle Depicted in O.S. Sheet 57, Forfar and Dundee, 1927;
Reproduced by permission of the National Library of Scotland**



Map of Melgund Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

ID: 20 Canmore ID: 34531 NGR: NO 54464 37661	Name: Panmure Alternatives: Pannmure, Panmurre	Latitude: 56.5287566444 Longitude: -02.74165424885 (WGS84)
Geographic References: Maps: Pont 26 (1601) Gordon 41 (1652) Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850)	Archaeological References: Architecture:	Documentary References: Manuscript: GD45/16 GD45/16/15 GD45/16/17 GD45/16/538 GD45/16/563 GD45/16/604 GD45/16/609 GD45/16/613 GD45/16/615 GD45/16/928 GD45/27/25 GD90/3/1 Printed Manuscripts: RMS, vol ii, no. 994; 1889; 2046; 2207; 2393; 3684; 3855. <i>RMS, vol iii, no. – 1274;</i> 2315; 758; 1274; 2315; 2330; 2393; 2523; 2315; 1274; 2315; 2330; 2523; 2315.
Secondary Sources: Books: Millar, 1890, 278. Hynd, 1984, 283.	Articles or Chapters:	Attribute Terms Used: Structural: Fortalice Castle Landscape Features: Mill Fishings

Table of Coordinates Used for Creating Panmure Map:

ID	Longitude	Latitude
Panmure	56.52876	-2.74165
Panmure Fishings 1	56.51513	-2.69291
Panmure Fishings 2	56.51290	-2.69251
Panmure Fishings 3	56.50699	-2.68224
Panmure Fishings 4	56.50459	-2.67712
Panmure Fishings 5	56.50901	-2.66573
Panmure Mill	56.53271	-2.75123



**Panmure Castle Aerial View: Getmapping plc, DigitalGlobe, Map Data
Copyright Google 2014**



**Panmure Castle Depicted in Pont 26, Adv.MS.70.2.9; Reproduced by
permission of the National Library of Scotland¹²⁵**

¹²⁵ Image covers approximately 7km².



Panmure Castle Depicted in Gordon 41, Adv.MS.70.2.10; Reproduced by permission of the National Library of Scotland¹²⁶



Panmure Castle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹²⁷

¹²⁶ Image covers approximately 65km².

¹²⁷ Image covers approximately 45km².



Panmure Castle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland



Panmure Castle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board



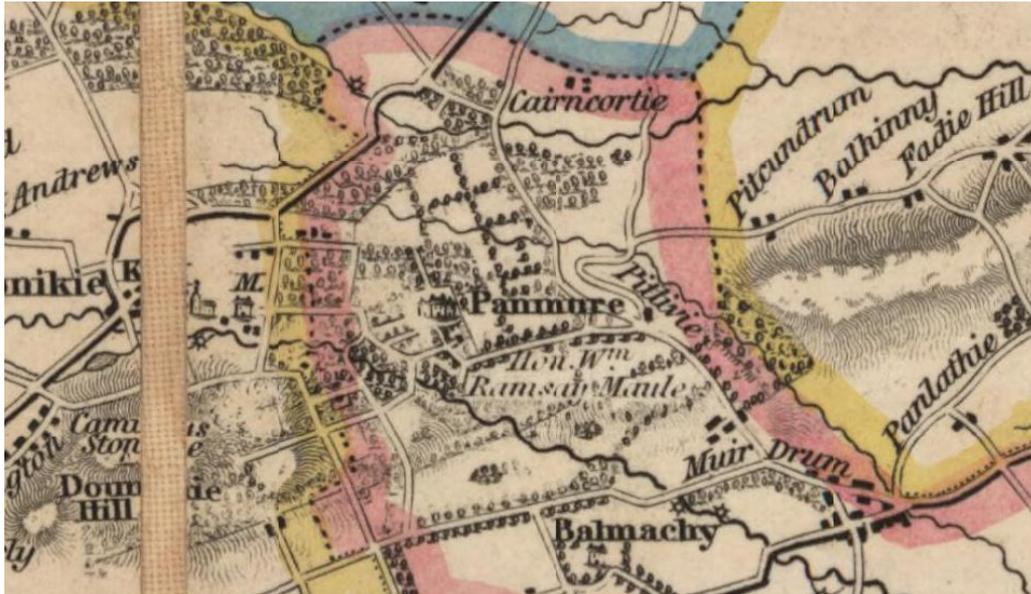
Panmure Castle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹²⁸



Panmure Castle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹²⁹

¹²⁸ Image covers approximately 25km².

¹²⁹ Image covers approximately 30km².

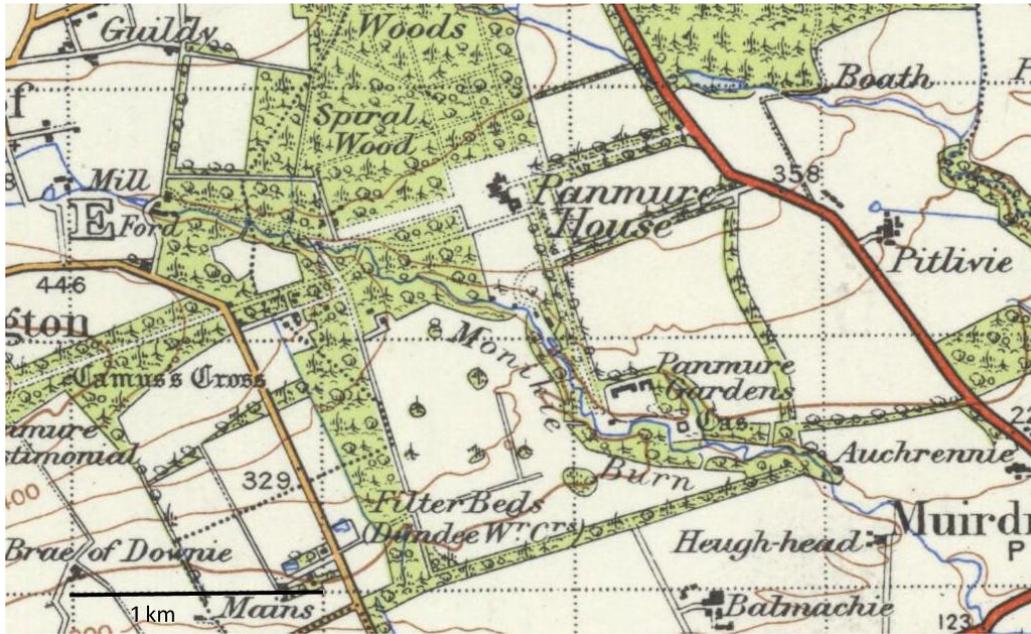


Panmure Castle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹³⁰

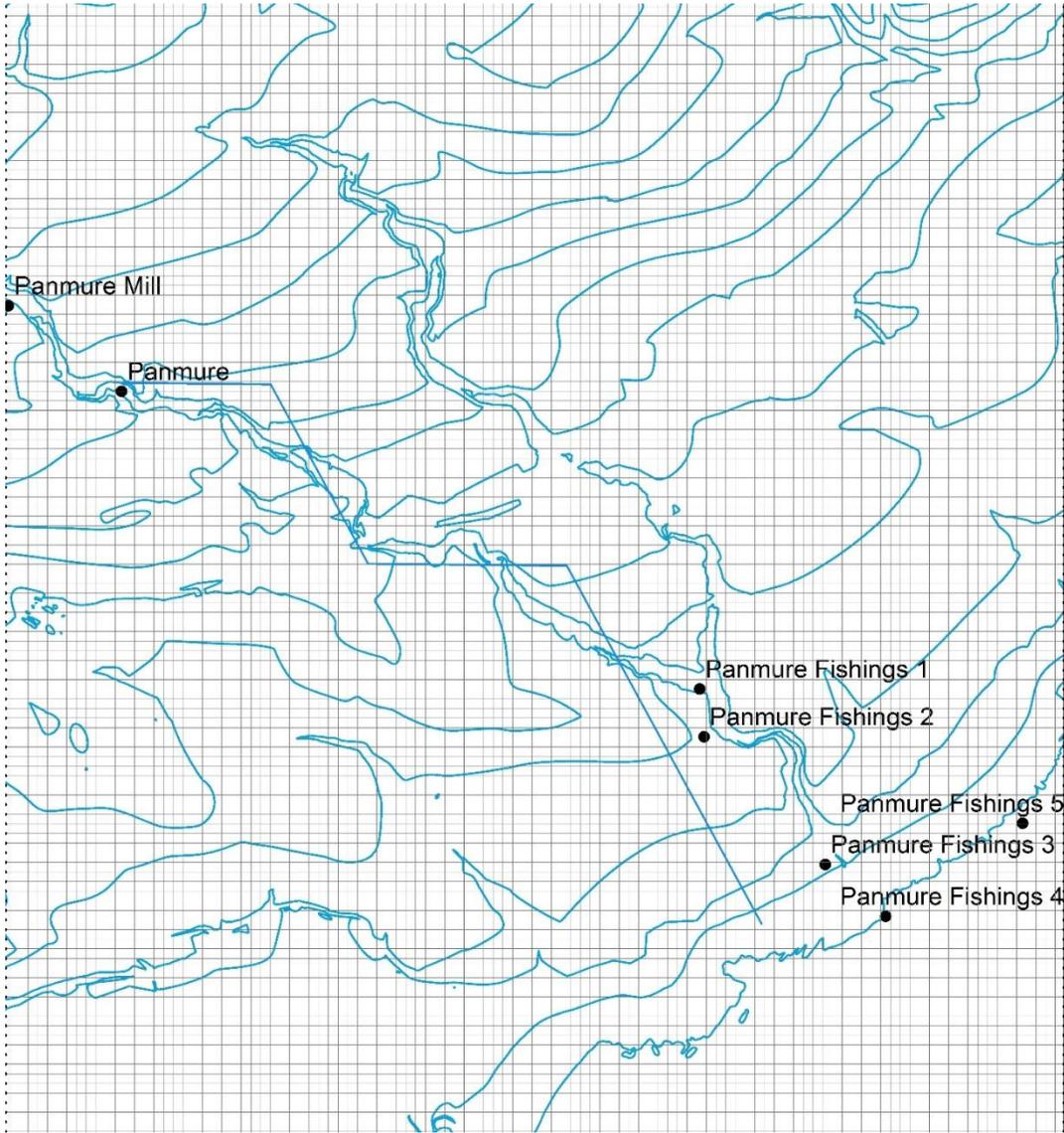


Panmure Castle Depicted in O.S. Forfar Sheet LI.7 (Panbride) 1865; Reproduced by permission of the National Library of Scotland

¹³⁰ Image covers approximately 25km².



Panmure Castle Depicted in O.S. Sheet 57, Forfar & Dundee, 1927; Reproduced by permission of the National Library of Scotland



Map of Panmure Castle with Mill and Fishings with 50m Overlay; Copyright Kate Buchanan

<p>ID: 21 Canmore ID: 35792 NGR: NO 68783 51079</p>	<p>Name: Redcastle Alternatives: Redecastell, Rubeum Castrum</p>	<p>Latitude: 56.6431748689 Longitude: -02.51232609489 (WGS84)</p>
<p>Geographic References: Maps: Edward (1678) Moll (1745) Roy – Highlands – (1752) Ainslie – Southwest – (1794) Thomson – Southern (1832) Knox (1850) O.S. – Forfar Sheet XLI.1 (Inverkeilor) – (1865) O.S. – Sheet 50, Forfar (1961)</p>	<p>Archaeological References: Architecture: MacGibbon and Ross, vol 1, 280-281.</p>	<p>Documentary References: Manuscript: GD45/16/2164-2182 GD45/18 GD246/76/4 Printed Manuscripts: RMS, vol ii, no. 1481; 3458; 573; 1481. <i>RMS, vol iii, no. – 1353; 2693.</i> <i>RMS, vol iv, no. – 946; 1229.</i></p>
<p>Secondary Sources: Books: Warden, vol 3, 446-452. Hay, 1899, 138.</p>	<p>Articles or Chapters: Simpson, PSAS 1940. J R Sherriff, D.E.S 1983, 35. A Gibson and D Pollock, D.E.S., 1983, 34.</p>	<p>Attribute Terms Used: Structural: Tower Fortalice Castle Landscape Features: Capital Message Mill</p>



Redcastle; Copyright Kate Buchanan



Redcastle; Copyright Kate Buchanan



Redcastle; Copyright Kate Buchanan



Redcastle Aerial View: Getmapping plc, DigitalGlobe, Map Data Copyright Google 2014



Redcastle Depicted in Edward, EMS.s.35; Copyright Nation Library of Scotland¹³¹

¹³¹ Image covers approximately 25km².



Redcastle Depicted in Moll, EMS.b.2.1(23); Reproduced by permission of the National Library of Scotland¹³²



Redcastle Depicted in Roy, Maps K.Top.48.25-1.a-f; Copyright British Library Board

¹³² Image covers approximately 115km².



Redcastle Depicted in Ainslie, EMS.s.356; Reproduced by permission of the National Library of Scotland¹³³



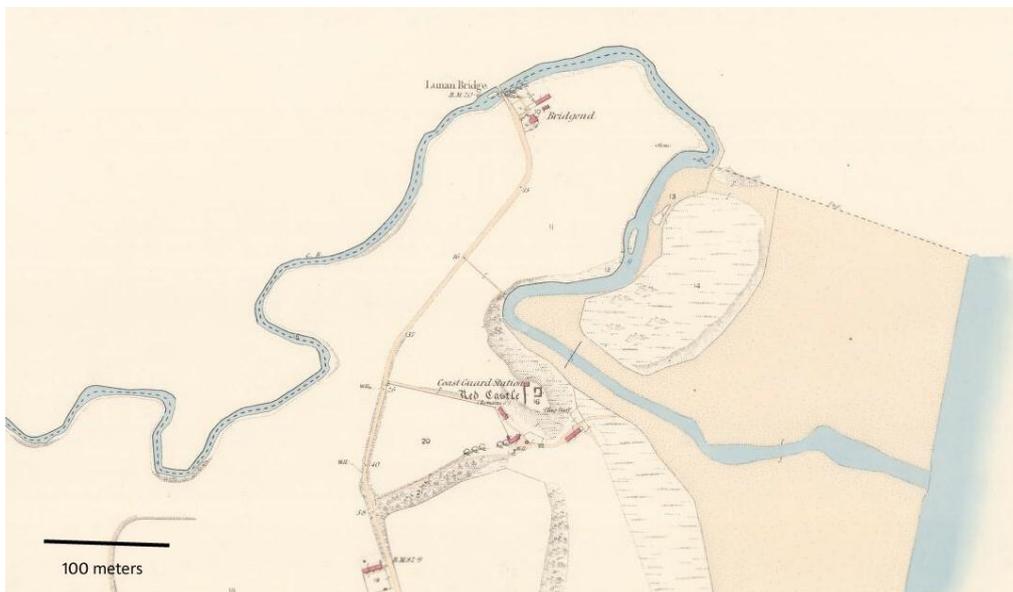
Redcastle Depicted in Thomson, EMS.s.712(20); Reproduced by permission of the National Library of Scotland¹³⁴

¹³³ Image covers approximately 25km².

¹³⁴ Image covers approximately 20km².



Redcastle Depicted in Knox, EMS.b.2.141; Reproduced by permission of the National Library of Scotland¹³⁵



Redcastle Depicted in O.S. Forfar Sheet XLI.1 (Inverkeilor), 1865; Reproduced by permission of the National Library of Scotland

¹³⁵ Image covers approximately 20km².



Redcastle Depicted in O.S. Sheet 50, Forfar, 1961; Reproduced by permission of the National Library of Scotland

Appendix B: Tables Used to Create Maps in Chapters Four: Attributes in Document Sources

Table for Castle Site:

Name	Latitude	Longitude
Brechin	56.7290432943	-2.65923857892
Airlie	56.6561696187	-3.1554397958
Auchterhouse	56.5228756112	-3.08873288145
Redcastle	56.6431748689	-2.51232609489
Montrose	56.7072803675	-2.47456929953
Broughty	56.462893999	-2.87019808116
Affleck	56.5385403809	-2.82435316647
Finavon	56.6973510383	-2.82329911533
Dun	56.7290750351	-2.54482333187
Wester- Morphie	56.7694932197	-2.47911726343
Panmure	56.5287566444	-2.74165424885
Inverquharity	56.709526652	-2.96330875801
Bonnyton	56.6934242952	-2.56168027778
Qwhitefield of Kirriemure		

Table for Fortalice Sites:

Place Name	Latitude	Longitude
Baikie	56.6306578199	-3.11260294593
Eastir- Denoon	56.5815212093	-3.06233560255
Balnamoon	56.7627958369	-2.73623626381
Broughty	56.462893999	-2.87019808116
Qwhitefield of Kirriemure		
Brechin and Nevar	56.7290432943	-2.65923857892
Dudhop	56.4642821451	-2.98386775785
Auchterhouse	56.5228756112	-3.08873288145
Kelly	56.5517945951	-2.63933367061
Dun	56.7290750351	-2.54482333187
Guthrie	56.6438811493	-2.71521412692
Fithie	56.6805453643	-2.59751055636
Panmure	56.5287566444	-2.74165424885
Inverquharity	56.709526652	-2.96330875801
Bonnyton	56.6934242952	-2.56168027778
Redcastle	56.6431748689	-2.51232609489
Dundee – St. Nicholas	56.4577188302	-2.96961330954

Table of Tower Sites:

Place	Latitude	Longitude
Eastir- Denoon	56.5815212093	-3.06233560255
Balnamoon	56.7627958369	-2.73623626381
Dudhop	56.4642821451	-2.98386775785
Kelly	56.5517945951	-2.63933367061
Wester- Morphie	56.7694932197	-2.47911726343
Guthrie	56.6438811493	-2.71521412692
Auldbar	56.7112428339	-2.69780475659
Bonnyton	56.6934242952	-2.56168027778
Redcastle	56.6431748689	-2.51232609489
Qwhitefield of Kirriemure		

Table of Mansion Sites:

Place	Latitude	Longitude
Fern	56.7435898928	-2.8450413971
Mains	56.4854453024	-2.95799552758
Balnamoon	56.7627958369	-2.73623626381
Lochmylne	56.6362126996	-2.93422921252
Cleaverhouse	56.5855104901	-3.00946761155
Dun	56.7290750351	-2.54482333187

Table of Manor-house Sites:

Place Name	Latitude	Longitude
Baikie	56.6306578199	-3.11260294593
Auchterhouse	56.5228756112	-3.08873288145
Fern	56.7435898928	-2.8450413971
Dalbog	56.8295935201	-2.66529800607
Eastir- Denoon	56.5815212093	-3.06233560255
Inverquiech	56.6329883163	-3.17858114621
Old Montrose	56.7072803675	-2.47456929953
Downie	56.5178670487	-2.78277025611
Carmyllie	56.5784921571	-2.74028391168
Ruthven	56.6177739164	-3.13746567059
Wester- Morphie	56.7694932197	-2.47911726343
Gardyne	56.6286975551	-2.69631277783
Guthrie	56.6438811493	-2.71521412692
Fithie	56.6805453643	-2.59751055636
Glenesk	56.8868223836	-2.70887041848
Finavon	56.6973510383	-2.82329911533
Cleaverhouse	56.5855104901	-3.00946761155
Inverarity	56.5855585783	-2.88270252539
Kinnaird	56.7040497894	-2.59883038809
Melgund	56.6965002805	-2.74284433295

Table of Mill Sites:

Place	Latitude	Longitude
Dundee	56.4559846654	-2.97764961592
Newbigging	56.4646820164	-3.06496170467
Pettendriech	56.5392592993	-3.1568034052
Balfour	56.6813276201	-3.08019412879
Kirriemuir	56.6769435581	-3.03358657618
Balkeerie	56.5970084102	-3.1078676471
Bow House	56.5210043861	-3.13812375094
Flemyington	56.6897755972	-2.77458014111
Balgillo	56.711814858	-2.83818648127
Kinnaber	56.7488198101	-2.4701878065
Kinnel	56.6417075381	-2.64266429863
Wester Derry	56.6775067068	-3.24231961155
Balglassie	56.7090101862	-2.76001322619
Glaskinno	56.7349385434	-2.51159659235
Montrose	56.7076659001	-2.47712215971
Balhallo	56.7519658271	-2.79826361704
Forfar	56.6358552974	-2.93276941422
Rossie	56.6973167466	-2.4999822391
Balcraig	56.5507975491	-3.13317816868
Kinnettes	56.6051311537	-2.94204629602
Kirkbuddo	56.5820348934	-2.84283290221
Grange	56.4135638052	-3.18154433474
Lunrathen	56.6776421671	-3.16510671639
Lownie	56.6214900761	-2.83533572209
Balmure	56.6797354244	-3.11205850779
Kingennie	56.5029476875	-2.87639539035
Chapelton	56.711949363	-3.01682196515
Balindarg	56.6472341836	-2.97320042607
Balmossie	56.4825704487	-2.85066067793
Glasswell	56.6725301066	-2.98395404579
Gilchorn	56.6286764936	-2.57564790574
Craigendowie	56.8126617242	-2.78682715147
Petmuies	56.6369278932	-2.7072896542
Tullo	56.7960208021	-2.76416330839
Easter- Marcus	56.7073338989	-2.79960472429
Auchendyne	56.7109390254	-3.10487663286
Campsie	56.6625002234	-3.17214424942
Panlaty	56.5220932666	-2.7151117099
Skryne	56.5220510715	-2.69724811012
Kyntrockat	56.7195666153	-2.70653680712
Blibberhill	56.7013010157	-2.73318937656
Arrat	56.7167008494	-2.58329856287
Telling	56.534101553	-2.9561020496
Petur	56.5190367126	-3.21588535269
Baldowrie	56.5455267016	-3.17825240063
Leidcreif	56.5214783839	-3.20226112807

Table of Fishing Sites:

Place Name	Latitude	Longitude
Balhawel (Blawyllo)	56.7612668451	-2.78795980831
Brechin	56.7287047791	-2.66039298342
Kynnabir	56.7510524796	-2.44189375821
Panbride	56.5129586082	-2.69251493012
Disart	56.7012588214	-2.50266376005
Bruchty	56.4629517081	-2.87349382488
Ville de Montrose	56.7051912383	-2.46874502813
Little Mylne et Lochmylne	56.6356748477	-2.93406919052
Claysched et Sandhauch (Balandro)	56.7739449073	-2.50743145328
Myltoun de Arrat	56.7158516089	-2.58431464588
Kirkton de Monyfuth,	56.4748947989	-2.81631696671
Bonyntoun	56.6913475321	-2.55399226956
Balnamone	56.7643463785	-2.74140312075
Dwn	56.7287584782	-2.54530902864
Grange	56.4142380143	-3.155761269
Stobhall	56.5239366814	-3.36682955921
Carrastoun	56.7151140527	-2.77688172532
Fethyis	56.6830651491	-2.6187048905
Dunnynad	56.6720400847	-2.47610044341
Auldbar	56.7193190748	-2.69945751665
Panmure	56.5279808901	-2.74217554356
Skryne – Panmure	56.5238691017	-2.69827303341
Newbigging	56.5113614512	-2.81914820485
Glenesk	56.8860003926	-2.70965900734
Finavon	56.698283113	-2.81682023361
Forest de Platane	56.6807780485	-2.90327544441
Pettintoskell – Brechin	56.7206638148	-2.67056203919
Inverquharity	56.5958290692	-2.91237020798
Hirdhill, Balbryde, Kynnordy	56.6752192062	-3.03783154449
Glenprosin	56.7772755589	-3.10219462229
Tayok on Southesk	56.7055814183	-2.53048666601
Tayok	56.7216974113	-2.47741428869
Gothrastoun	56.4626689957	-3.06187054114
Forfar	56.6443093045	-2.90108247856
Kynnard	56.7124839482	-2.59917679465
Balnacauch - melgund	56.7047686625	-2.73626199576
Dunloppy	56.8020209814	-2.67060600784
Laidcrieff	56.528535306	-3.2348369757

Table of Park Sites:

Place	Latitude	Longitude
Finavon - Parkford	56.6828494656	-2.85939941482
Finavon Parkyet	56.6973415331	-2.82473588947
Bonnyton	56.6948504189	-2.56219136114
Carmyllie	56.5784921571	-2.74028391168

Table of Woodland Sites:

Place	Latitude	Longitude
Wester Campsie	56.6654069557	-3.17259346175
Brechin	56.7280455958	-2.66271838707
Bonnyton	56.6948036595	-2.56259886091
Ledcrieff	56.5233729564	-3.20331270771
Glenprosen	56.7782064926	-3.10258195032
Gleneffock	56.8661636743	-2.70503486518
Aldbar	56.6913617485	-2.73064508501

Table of Forest Sites:

Place	Latitude	Longitude
Platane	56.6908415765	-2.89936950134
Glenprosen	56.7782064926	-3.10258195032
Kilgary	56.8082975028	-2.7117106403
Gleneffock	56.8661636743	-2.70503486518
Lisden	56.6766313456	-2.99132368834
Auldbar	56.6913617485	-2.73064508501

Table of Orchards:

Place	Latitude	Longitude
Old Montrose	56.7028230869	-2.53475930977
Downie	56.5178670487	-2.78277025611
Baikie	56.6306578199	-3.11260294593

Table of Gardens:

Place	Latitude	Longitude
Dudhop	56.4642821451	-2.98386775785
Old Montrose	56.7028230869	-2.53475930977

Appendix C: Calculations of Total Population and I_{max}, I_{min}, and RI**Affleck****Lower Tables**

$$696cm - 340cm = 356cm$$

$$\frac{356}{65} = 5.47 = 6$$

4(6) = 24 guests seated at the lower tables

High Table

$$696cm - 240cm = 456cm$$

$$456cm - 90cm = 366cm$$

$$\frac{366cm}{65cm} = 5.6 = 6 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 6 + 24 = 31$$

Total Number of Serving Staff

$$\text{Total Servants} = 3\left(\frac{31}{4}\right) + \frac{31}{10}$$

$$TS = 3(7.75) + 3.1$$

$$TS = 23.25 + 3.15$$

$$=27 \text{ *Serving Staff*}$$

Total Population of the Residence

Total Servants + Total Diners

$$31 + 27$$

$$=58$$

Affleck at Maximum Capacity

$$I_{max} = \frac{58(103353.5)}{1120^2}$$

$$I_{max} = \frac{5994503}{1254400}$$

$$I_{max} = 4.778781091$$

Affleck at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{1120^2}$$

$$I_{min} = \frac{1033535}{1254400}$$

$$I_{min} = 0.823927774$$

Relative Interaction

$$RI = \frac{4.778781091}{0.823927774}$$

$$RI = 0.172414$$

Broughty

Lower Tables

$$1051cm - 340cm = 711cm$$

$$\frac{711}{65} = 10.9 = 11$$

4(11) = 44 guests seated at the lower tables

High Table

$$1051cm - 240cm = 811cm$$

$$811cm - 90cm = 721cm$$

$$\frac{721cm}{65cm} = 11.09 = 11 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 11 + 44 = 56$$

Total Number of Serving Staff

$$Total\ Servants = 3\left(\frac{56}{4}\right) + \frac{56}{10}$$

$$TS = 3(14) + 5.6$$

$$TS = 42 + 5.6$$

$$=48 \text{ Serving Staff}$$

Total Population of the Residence

Total Servants + Total Diners

$$56 + 48$$

$$=104$$

Broughty at Maximum Capacity

$$I_{max} = \frac{104(103353.5)}{2490^2}$$

$$I_{max} = \frac{10748764}{6200100}$$

$$I_{max} = 1.7336436$$

Broughty at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{2490^2}$$

$$I_{min} = \frac{1033535}{6200100}$$

$$I_{min} = 0.1666965$$

Relative Interaction

$$RI = \frac{0.1666965}{1.7336436}$$

$$RI = 0.096154$$

Edzell

Lower Tables

$$700cm - 340cm = 360cm$$

$$\frac{360}{65} = 5.53 = 6$$

4(6) = 24 guests seated at the lower tables

High Table

$$700cm - 240cm = 460cm$$

$$460cm - 90cm = 369cm$$

$$\frac{369cm}{65cm} = 5.6 = 6 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 6 + 24 = 31$$

Total Number of Serving Staff

$$\text{Total Servants} = 3\left(\frac{31}{4}\right) + \frac{31}{10}$$

$$TS = 3(7.75) + 3.1$$

$$TS = 23.25 + 3.1$$

$$=27 \text{ *Serving Staff*}$$

Total Population of the Residence

Total Servants + Total Diners

$$31 + 27$$

$$=58$$

Edzell at Maximum Capacity

$$I_{max} = \frac{58(103353.5)}{1970^2}$$

$$I_{max} = \frac{5994503}{3880900}$$

$$I_{max} = 1.5446167$$

Edzell at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{1970^2}$$

$$I_{min} = \frac{1033535}{3880900}$$

$$I_{min} = 0.2663132$$

Relative Interaction

$$RI = \frac{0.2663132}{1.5446167}$$

$$RI = 0.1724137$$

Glamis

Lower Tables

$$1307cm - 340cm = 967cm$$

$$\frac{967}{65} = 14.87 = 15$$

4(15) = 60 guests seated at the lower tables

High Table

$$1307cm - 240cm = 1067cm$$

$$1067m - 90cm = 977cm$$

$$\frac{977cm}{65cm} = 15.03 = 15 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 15 + 60 = 76$$

Total Number of Serving Staff

$$\text{Total Servants} = 3\left(\frac{76}{4}\right) + \frac{76}{10}$$

$$TS = 3(19) + 7.6$$

$$TS = 57 + 7.6$$

$$= 65 \text{ Serving Staff}$$

Total Population of the Residence*Total Servants + Total Diners*

$$76 + 65$$

$$= 141$$

Glamis at Maximum Capacity

$$I_{max} = \frac{141(103353.5)}{2570^2}$$

$$I_{max} = \frac{14572843}{6604900}$$

$$I_{max} = 2.2063684$$

Glamis at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{2570^2}$$

$$I_{min} = \frac{1033535}{6604900}$$

$$I_{min} = 0.15648003$$

Relative Interaction

$$RI = \frac{0.15648003}{2.2063684}$$

$$RI = 0.0709219$$

Inverquharity

Lower Tables

$$1000cm - 340cm = 660cm$$

$$\frac{660}{65} = 10.15 = 11$$

4(11) = 44 guests seated at the lower tables

High Table

$$1000cm - 240cm = 740cm$$

$$740cm - 90cm = 645cm$$

$$\frac{645cm}{65cm} = 9.92 = 10 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 10 + 44 = 55$$

Total Number of Serving Staff

$$Total\ Servants = 3\left(\frac{55}{4}\right) + \frac{55}{10}$$

$$TS = 3(13.75) + 5.5$$

$$TS = 41.25 + 5.5$$

=47 *Serving Staff*

Total Population of the Residence

Total Servants + Total Diners

$$55 + 47$$

$$=108$$

Inverquharity at Maximum Capacity

$$I_{max} = \frac{108(103353.5)}{409^2}$$

$$I_{max} = \frac{11162178}{167281}$$

$$I_{max} = 66.727111$$

Inverquharity at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{409^2}$$

$$I_{min} = \frac{1033535}{167281}$$

$$I_{min} = 6.1784362$$

Relative Interaction

$$RI = \frac{6.1784362}{66.727111}$$

$$RI = 0.0925925$$

Redcastle

Lower Tables

$$1174cm - 340cm = 834cm$$

$$\frac{834}{65} = 12.83 = 13$$

4(13) = 52 guests seated at the lower tables

High Table

$$1174cm - 240cm = 934cm$$

$$934cm - 90cm = 844cm$$

$$\frac{844cm}{65cm} = 12.98 = 13 \text{ guests at the High Table}$$

Total Number of Diners

$$1 + 13 + 52 = 66$$

Total Number of Serving Staff

$$\text{Total Servants} = 3\left(\frac{66}{4}\right) + \frac{66}{10}$$

$$TS = 3(16.5) + 6.6$$

$$TS = 49.5 + 6.6$$

$$= 57 \text{ Serving Staff}$$

Total Population of the Residence*Total Servants + Total Diners*

$$66 + 57$$

$$=123$$

Redcastle at Maximum Capacity

$$I_{max} = \frac{123(103353.5)}{1390^2}$$

$$I_{max} = \frac{12712480}{1932100}$$

$$I_{max} = 6.579618$$

Redcastle at Minimum Capacity

$$I_{min} = \frac{10(103353.5)}{1390^2}$$

$$I_{min} = \frac{1033535}{1932100}$$

$$I_{min} = 0.5349283$$

Relative Interaction

$$RI = \frac{0.5349283}{6.579618}$$

$$RI = 0.0813008$$

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