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Introduction

1.1 Research Aims

Fortified hilltop enclosures, usually referred to as hillforts, are a common type of archaeological structure found throughout Europe. Hillforts are often seen as Bronze and Iron Age structures (Ralston 2000; Alcock 2003; Harding 2012; Lock and Ralston 2022), however, there is increasing evidence of a resurgence in construction and refortification in the early medieval period in northern and western Britain, and in particular Scotland (see Alcock's reconnaissance excavations; Alcock 2003; Noble and Evans 2019; 2022). Yet, the identification of early medieval hillforts in Scotland has been difficult and to date, there is no corpus of the fortified enclosure forms in the early medieval period and there have been few ways morphologically to identify new sites without excavation. The overall study of hillforts has often fallen into a narrow discourse on status (Ralston 2009; Harding 2012; Noble and O'Driscoll 2019), with very few new ideas being forwarded regarding their function and roles within early medieval society, and the overall number of identified sites still remains very small. More generally, particularly in Iron Age scholarship, forts have been viewed as defensive and military strongholds (see Wheeler 1943; Armit 2007; Collis 2007; James 2007), but discussions of their ceremonial and ritualistic purposes have emerged in recent years (see Bowden and McOmish 1987; Lock 2011; Harding 2012; Driver 2013), an element that has only seen limited discussion in the early medieval period.

In the early medieval period, debates about the potentially multi-functional elements of these enclosures, for example, defense, trade, and habitation have not received the same attention as Iron Age hillforts and even basic details about the morphology and character of these sites are underdeveloped. Very few Scottish early medieval forts have been excavated or dated with just over two dozen sites reliably dated. This book aims to provide a new means of identifying potential sites through keyhole excavation, geographical information systems (GIS) including hillshade, visibility, and landscape models, and will create a database of forts that have potential phases of occupation or construction in the early medieval period that can form the basis of field testing.

In northern and western Britain sources suggest that defended settlements, such as hillforts, were key manifestations of kingship, though sources are rather limited (Lane and Campbell 2000; Alcock 2003; Noble et al. 2019). There is clear evidence of wealth accumulation and redistribution at these sites through the presence of high-status metalworking, evidence of long-distance trade, and cattle-rich faunal assemblages (e.g., Clatchard Craig, Dundurn, and Dunadd in Scotland) (Lane and Campbell 2000; Seaman 2013; Noble 2016; Noble and Evans 2022). The most famous class of fortified site in early medieval northern Britain is the so-called 'nuclear hillfort' (defined by R.B.K. Stevenson in 1949), a hilltop site that has long been a classic element of our understandings of this period, yet few of these have been dated and the site type itself has been questioned (see Alcock et al. 1989; Lane and Campbell 2000; Alcock 2003; Harding 2012; Noble and O'Driscoll 2019). Stevenson defined the 'nuclear' fort as consisting of a central citadel or enclosure located on the summit or centre of the hill with connecting outworks that descend the summit connected to the central enclosure creating a hierarchal organisation of space (Stevenson 1949, 186). Stevenson coined the term 'nuclear' due to the amorphous 'organic' design and the morphology of the radiating enclosing elements from the 'nucleus' of the hillfort (Stevenson 1949, 186). A more comprehensive definition of the 'nuclear' fort is found in **Chapter 4**.

The main aim of this research is to create the first corpus of early medieval hillforts, more specifically of the 'nuclear' or 'complex' form in Scotland and develop a new understanding of this important category of evidence. The author will also assess how these monuments fit into the broader narrative of fortified settlements in early medieval Europe.

Some of the main questions to be addressed include:

- Are 'nuclear hillforts', a long-discussed site-type in early medieval archaeology, a distinct monument type? Or are they a product of archaeologists trying to add order to multi-period development of individual sites of multiple chronologies?
- What can field testing of potential sites reveal? How does the chronology of a number of case study sites compare – is there evidence for early medieval occupation at some or all these sites? Did these develop over comparatively short periods of time or are some sites the product of multi-period development?
- Are there clear differences in the character/date of 'classic' nuclear forts (as defined by Stevenson) such as Dalmahoy Hill, and citadel forts (as proposed by Feachem 1955), such as Dumyat, the courtyard forts of southern Scotland (proposed by Truckell 1963), and complex dun-with-outworks in western Scotland (suggested by Alcock 2003) and do these sub- categories stand up to scrutiny?
- Can keyhole trenching reveal anything about the status/function of these sites? Are there clear differences between enclosing elements within the forts?

- If early medieval deposits are identified within the fort, how does this alter the regional evidence for early medieval activity in each case? Likewise with Iron Age activity/other periods how does this evidence augment or alter local and regional patterns?
- Is it possible to determine if the 'nuclear' hillforts in this work are 'central places' or part of a central place complex?

During this project the new database and the results of fieldwork will allow a new and more complete consideration of hillforts in early medieval Scotland and the distribution of these sites. The fieldwork will provide a new body of data to be produced to address this seminal period of Scottish history. Since Alcock's reconnaissance excavations in the 1980s, there has been very little done to evolve or add to the 'nuclear/complex' fort concept and very few sites added to the corpus. The terms 'nuclear' and 'complex' are used interchangeably until the discussion where the author suggests the term 'complex' is better suited for these forts.

1.2 Structure

This book consists of seven chapters starting with a brief overview of early medieval Scotland in chapter 2. Chapter 3 is an overview of Hillfort studies. Chapter 4 is a review of early medieval forts in Scotland and the history of the 'nuclear' fort. Brief summaries of past excavations of 'nuclear' forts are also in this chapter. Chapters 5 focuses on a discussion of the database and sites. The sites are summarised with analyses of each fort's height, size, number of enclosing elements, and morphology. This discussion groups the sites loosely on cultural area and geographical location. Chapter 6 is a discussion on chronology, excavations undertaken by the author, and an overview of how the sites fit into the early medieval world. The chapter will also discuss issues with the 'nuclear' definition. Chapter 7 is the conclusion and focuses on important future studies on the topic.

The main discussion chapter focuses on many questions including:

- What is the purpose(s) of these sites in the local and wider environment?
- Why were hillforts seemingly abandoned in the Roman Iron Age Scotland, with a return in the early medieval period? Is there evidence of this at 'nuclear/complex' forts?
- Were these forts 'central places'?
- Were these sites built to be visible?
- Is the 'nuclear' fort a distinct site type?
- How do the field excavations and chronologies obtained from the case studies from this project allow us to reassess the chronology of early medieval forts? How do the excavations compare to past excavations?
- How do the Scottish examples compare to forts from the continent and the rest of Britain and Ireland?

Each hillfort in these chapters is described with a map of its location in its respective landscape including known or possible early medieval sites within 5km. This data was collected from Canmore (https://canmore.org.uk/) between 2021-2024, however Canmore no longer is accessible and has switched over to trove.scot (https://www.trove.scot/) (date accessed 01/03/2026). All ID numbers are the same on this website, the national historic record of Scotland. Additionally, each fort's location in the landscape, morphology, past excavations (if any), and local archaeological landscapes are discussed.

1.3 Landscape Archaeology and GIS

Drone survey to create models for ArcGIS was undertaken at many of the sites in the database. Imagery from the drone was placed into the application Pix4D (https://www.pix4d.com) (date accessed 01/03/2026). This application was then used to create a DTM (digital terrain model) and an orthomosaic which can be used in ArcGIS to create other spatial models such as hillshade and slope models. Oblique aerial photos were also taken. Some sites were not visited due to time constraints and COVID, however, some of the sites have LiDAR that was sourced from the Scottish Remote Sensing Panel website (https://remotesensingdata.gov.scot/data#/map) (date accessed 01/03/2026). If the site was not visited and there has been no LiDAR carried out, plans for the forts were redrawn from past surveys, mostly from past RCAHMS inventories. A small number of sites have no official plan of the hillforts morphology drawn by past researchers and their inclusions in the database is based on previous survey, aerial imagery, or photogrammetry done by the author.

A map of Scotland was sourced from Edina Digimap (Digimap (edina.ac.uk)) (date accessed 01/03/2026) and all forts in the database were mapped. Other early medieval sites, possible early medieval sites, and some prehistoric sites were mapped using datasets from Canmore to create a picture of a possible early medieval landscape. Cumulative viewsheds were created for each fort in the database by plotting numerous points within the fort (on average 20-50). Numerous points within the forts were placed due to the size of the sites as well as considering visibility from a variety of locations within the fort, including the lower enclosing elements and terraces. This creates a more nuanced and complete visibility model instead of a static point.

1.4 Landscape Archaeology

Landscape archaeology is defined as the study of cultural and environmental variables and how they influence the relationship of humans with the landscape (See Ingold 1993; David and Lourandos 1999; Hu 2012, 80). This is done by collecting information on land use from prehistoric landscapes to elucidate relationships between the communities and the lived landscape (Turner 2013, 15). This includes locations of monuments and structures, as well as the visibility of these sites from each other. There

are many ways to interpret landscape archaeologically, however, a full review of landscape archaeology is outside the scope of this book. The study of the landscape within archaeology has been used since the 1920s, however, this method did not reach significant levels of usage until the 1960's and 70's with Aston and Rowley (1974). The term 'Landscape Archaeology' however is not mentioned in archaeological journals until the mid-1980s (Bintliff 1996, 246; Thomas and David 2008, 27-8). During this time, quantitative methods, such as geographical and statistical methods were popular. However, it was not until the 1980s and 90s when post-processualism began to grow within archaeology that qualitative methods were used to examine past landscapes in a cultural view with more emphasis on the individual and group perceptions of the landscape and how it affected behaviour (Bintliff 1996, 246). Others such as Turner (2013, 131) view landscape as part of a network between it and people which in turn illuminates an individual's experience of the world. This fits into the broader topic of landscape phenomenology. Tilley (2009, 25) states that the landscape through a phenomenological perspective 'is gained through perceptual experience of them from the point of view of the subject.' Tilley suggests the main objective of studying past landscape is to provide a deep description to allow others in the present or future the ability to comprehend it creating more diversity and complexity to create a wider understanding (Tilley 2009, 25). Tilley (2009) and Thomas (2006) both view statistical analysis such as GIS unfavourably because it does not allow personal experience to influence the data (Tilley 2009, 26). Turner (2013, 15) and others (see Dommelen 1999 and Given and Knapp 2003) have stated that research on the entire landscape is necessary instead of focusing on individual high-status sites.

1.5 GIS

GIS has become an integral part of landscape archaeology over the past few decades. It allows the user to examine large quantities of spatial data in a short amount of time. Wheatley and Gillings (2000, 1) state that viewshed analysis is one of the more significant uses of GIS for archaeologists and allows researchers to view the site from numerous locations. The use of GIS is extensive in archaeology with it becoming a prominent data method of many projects whether in academia or the commercial sector.

Forerunners of GIS methods began in the 1970s with research conducted in Britain by the likes of Cunliffe (1971), Clarke (1972), Hogg (1975), and Collis (1977) using Thiessen Polygons to define hillfort territory (O'Driscoll 2017, 75). Then, during the 1990s, an increase of the use of visibility analysis using computer generated GIS models to develop an understanding of the landscape occurred and it became one of the most popular techniques used by archaeologists (O'Driscoll 2017, 75).

Major works arose from the use of GIS in the 1990s with Lock and Harris (1996, 232) using visibility viewsheds to show the expansive visibility from Danebury Hillfort over the local landscape and its position as a 'central place' in the Iron Age. Lock and Harris (1996, 232) also argue that for GIS to be used effectively it must be through a theoretical approach.

Viewshed analysis is used to identify things that are and are not visible from a single, or numerous points within a digital terrain model (Paliou 2013, 2; O'Driscoll 2017, 75). Viewshed analysis has been used to determine the visibility of numerous objects and features in the landscape including, contemporary or past monuments, environmental influences, as well as the position of astronomical arrangements (Wheatley and Gillings 2000, 2). Wheatley (2004, 11) states that viewshed analysis can be beneficial to more theoretical approaches including temporality, directionality, and cognitive perception. In the context of hillforts, the reason for construction in certain areas was likely due to visual prominence and ability to see certain pathways and routeways in the landscape (Wheatley and Gillings 2001, 3). Viewshed analysis is also used to view connections between similar structures or site types creating 'chains' or networks that cross the landscape (Wheatley and Gillings 2001, 4). For example, Ozawa (et al. 1995) used viewsheds to examine Late Yayoi Period hilltop sites that were used as a 'beacon system' through line of sight. Kantner and Hobgood (2016, 1314-15) used viewsheds to assess intervisibility between kiva towers in Chaco Canyon and determined visibility was poor and they were unlikely built to be part of a wider communication network. However, visibility and intervisibility of local housing structures was good. Seaman and Thomas (2020) analysed the early medieval fort of Dinas Powys in Wales using Least Cost Pathways (LCPs), 3D analysis, and viewshed analysis to determine how the fort implemented its high status throughout the local landscape. LCPs are used to map the easiest route between two points and are helpful in establishing visibility or possible routeways through the landscape, however, there are issues when topography is more open with less variation in terrain (O'Driscoll 2017, 75). Using spatial analysis on hillforts can help analyse the importance of the location of the site and its visibility over routeways, communities, and other hillforts (Seaman and Thomas 2020). O'Driscoll (2017) used cumulative viewshed analysis on Irish Bronze Age hillforts and determined that visibility was one of the primary reasons for the location of their construction. This work also suggested the importance of hillforts in the control of movements of people and trade, having similar views as Sherratt (1996) and Fonte et al. (2011).

1.6 Drawbacks and Bias of GIS

There are differing opinions of the significance of GIS in archaeology, especially while examining past landscapes (Hu 2012, 80-1). Tilley (1994, 14) states that there are two definitions of what landscape is, a scientific/abstract definition, which views the landscape as universal and absolute, while a 'humanised' definition sees it as qualitative and experienced differently between

individuals. An argument that continues to be discussed is whether GIS is a beneficial theoretical tool in archaeology with major criticisms from the likes of Thomas (2004; and David 2008) and Tilley (1994). Arguments made against the use of GIS mostly focus on how it is a digital interpretation of the past and takes any aspect of individual experience out of the equation. Tilley (1994, 7-11) views maps as a container and suggests that they reduce space to simple dots that are measured without human action. These views seem to be directed towards more simple models which are not three-dimensional. GIS used on its own does create issues while studying the past, however, used within a theoretical framework and with understanding of its limitations it can benefit landscape archaeology tremendously.

Other concerns put forward by Gaffney et al. (1996) suggests GIS has not been as beneficial to archaeology as some believe due to creating a structured construct on past people's cognition and view of the landscape they lived in – something that is not possible, albeit no part of prehistoric archaeology can do this. GIS creates a 'static' view of past landscapes and simplifies the complexities of the past (Gilling and Goodrick 1996).

1.7 The Central Place

Central places in archaeology are defined as structures or monuments that would have had some sort of significance over a local landscape or settlement, such as control of political, trade, or religious functions (Brink 1996, 237). Central Places were integral to early medieval society throughout Europe and seem to increase at an exponential rate between the 5th and 8th century AD. This rise in kingship and elite centres coincides with the changes to economic, religious, and political entities within the early medieval world (Del Rio 2020, 31). Central place theory has been an essential part of the study of geography and archaeology through the years with more well-known examples beginning in the late 1970s (see Hogg 1971; Cunliffe 1971; Hodder and Orton 1976; Clarke 1972; 1977; Hodder 1977; Renfrew and Level 1979), however, Christallers (1966) was the first to publicise the concept in spatial geology.

Haselgrove's (1986) paper summarises past work on central places in the British Iron Age, while acknowledging the constraints and bias of using Iron Age data, while Collis (1986) disagrees with the term 'central place' suggesting it is overused. He also disagrees with hillforts being 'assumed' as central places even if there is evidence of permanent and extensive occupation (Collis 1986, 39). Cunliffe has also criticised parts of central place theory such as how sites need to have evidence that prove it was a 'central place' and that its purpose is not assumed (Cunliffe 1976). Earlier studies by Cunliffe (1971) and Hogg (1971) were integral to central place studies, however, there is valid criticism of the papers due to, as Haselgrove (1986, 5) states, 'a blanket treatment' of sites without recognition of their morphological or chronological differences. Hogg (1971) created a hierarchal model that determined that the larger the site was, the larger the territory was spatially, which surely could garner criticism with Collis (1984; 1987, 37) stating that the most central place in Bohemia, Závist, was unlikely the top of settlement hierarchy with the much smaller site of Stradonice a more likely contender due to coin and pottery distribution. Clarke's (1972) work on the Glastonbury region created a predictive model that determined that the hillfort in the region was the central foci of the territory (Haselgrove 1986, 5). He suggested that the increase of specialisation and exchange led to the Late Iron Age and the beginning of a more complex hierarchy (Clarke 1972; Haselgrove 1986, 5).

The author is basing the central place complex and landscape maps created through this project on Stefan Brink's (1996;1997) seminal work on Viking Age Scandinavia. Brink attempted to reconstruct political structures and territorial regions in Scandinavia that were predecessors to 'state' societies (Brink 1996, 236). He suggested this was a process that forced petty kingdoms and chieftains into a more hierarchal society (Brink 1996, 237). He also argues that there is a hierarchy within central places; Brink uses the example of well-known places in Sweden, such as Uppsala, Sigtuna, Birka, and Lejre as well-known central places, however, states there are smaller central places that have been lost (Brink 1996, 236). Brink identifies central places, or central place 'complexes' by looking for specific clusters of sites including 'special buildings', such as churches and halls, high-status artefacts (gold, weapons, bracteates, and craftsman tools), prehistoric monuments (burial mounds, boat burials, and graves with weapons), and placenames, that would suggest a central place or significant community (Brink 1996, 236).

The author has created landscape maps looking for a group of sites around possible early medieval hillforts. Sites identified included early medieval or possible church sites, square barrows, long cists, carved stones, Pictish symbol stones, hoard sites, Neolithic monuments (chambered cairns, stone circles, henges, etc.), penannular brooches, cave sites, and Viking/Norse sites. Neolithic monuments were selected to see if there is a possible connection in visibility or location of sites to earlier monuments (see the work of Semple 2013 examining Anglo-Saxon landscape). Dunadd, for example, is a well-known early medieval fort with a mention in the *Annals of Ulster* (AU 683.3) as being sieged. The fort is surrounded by other possible early medieval forts, Neolithic sites, and many early medieval sites. Others such as Craig Rock in Fife, have not been suggested as early medieval forts, yet have an abundance of possible early medieval sites in the local landscape. Identifying hillforts in regions with high concentrations of early medieval sites may suggest sites they acted as central places, or part of a central place complex.

1.8 Research Approach/Theory

The approach taken during this book while analysing early medieval hillforts and the 'nuclear' fort in Scotland

considers it as a potential site type found throughout modern day Scotland while also considering regional disparities. The author argues that the rigidness of the traditional 'nuclear' fort definition has stunted the growth of understanding of early medieval fortified hilltop sites. As mentioned previously, the forts have been placed within three distinct regions (Southern Scotland, Dál Riata, and Pictland) with analysis in the discussion chapter and individual site descriptions in the fort appendix.

A key question of this project is the significance and function of these hilltop monuments and how they fit into the overall landscape. Landscape and visibility models have been created for all the forts in the database using other archaeological monument datasets from Canmore. Keyhole excavation was undertaken at six different forts within Pictland, specifically targeting enclosing elements to obtain dating evidence of their construction.

1.9 Excavations and Database

During the author's masters dissertation, a database using Microsoft Access was created with hillforts that have characteristics of an early medieval phase or construction. The sites were added to the database by using numerous sources including *The Atlas of Hillforts of Britain and Ireland* (Lock and Ralston 2017), Canmore, RCAHMS inventories, past analysis of the 'nuclear' fort, and survey and ArcGIS work undertaken by the author. Specific attributes were reviewed to determine if the sites fit into the category of a 'nuclear' fort. These include:

- A small central enclosure or citadel (usually around or less than 0.2ha)
- A rocky isolated outcrop or promontory
- Complex morphology with walls attaching to a central nucleus
- Natural and or artificial terracing within enclosing elements
- Landscape prominence
- Visibility of local landscape and archaeological landscape
- Known excavated sites with early medieval dates in close proximity of the hillfort

All 1,695 hillforts in the *Atlas of Hillforts* in Scotland were reviewed, with 120 sites fitting into these attributes. Each fort was defined as being a known, probable, or possible early medieval complex fort (table 1.1). Some examples in this database are confirmed, while are others are less certain. The database was then split into three geographical regions, Pictland, Western Scotland, and Southern Scotland. Each site has its own discussion with images of landscape, plan (if any), and aerial photos. These are all found within **the Database**.

One of the main approaches of this work was keyhole excavation at six hillforts that show characteristics of the 'nuclear' or 'complex' hillfort site type. The sites chosen are Mither Tap of Bennachie, Aberdeenshire (**NRHE 85507**), Craig Dorney, Aberdeenshire (**NRHE 17275**), Norman's Law, Fife (**NRHE 31814**), Dunmore, Fife (**NRHE 51028**), Craig Rock, Fife (**NRHE 340454**), and Dunsinane Hill, Perth and Kinross (**NRHE 30660**). Sites such as Dunsinane Hill and Norman's Law were chosen due to having a structural 'nuclear' morphology yet being larger in scale than most early medieval forts in Scotland. Mither Tap and Norman's Law have in the past been determined to fit into the 'nuclear' category, while the other four are previously unidentified targets that the author suggests fits the definition. Targeted keyhole excavation of enclosing elements at these sites to retrieve dating evidence has been undertaken to test the applicability of the traditional 'nuclear' definition, as well as investigate new characteristics to determine the nature of these sites. Targeted excavation will not tell the whole history of the site, however, early medieval dates from the sites may add validity to the site type. Excavation of the enclosing elements was used to determine the construction and occupation of parts of the fort on a broad level to help create a new chronology of these sites.

The sites of Craig Rock, Dunmore, and Craig Dorney were selected to their specific topographic position and size. Each site has a similar appearance to what is seen at other known early medieval forts such as Dundurn and Dunadd. This was a main point of this work: an attempt to identify sites that are not historically referenced such as the *Annals of Ulster* and similar sources of the early medieval period. Mither Tap was selected to its possible historical reference in the name Bennachie, meaning 'The mountain of the people *Cé*' as well as having a higher degree of inaccessibility than many other forts found in Scotland (Noble and Evans 2022). The sites of Dunsinane Hill and Norman's Law were selected to their nucleated morphology and their large size compared to other forts in this database.

The main aim of the keyhole excavations was to target the enclosing elements of the fort to determine construction phases. More specifically the central enclosure or citadel was specifically targeted. Excavation focused on uncovering occupation layers near the base of the rampart walls for charcoal or faunal remains to try and pinpoint the original construction of the enclosure. Samples were taken in 2L bags and were brought back to the University of Aberdeen for post-excavation analysis.

Table 1.1 Hillfort categories

Known	A fort that has radiocarbon dates in the early medieval period
Probable	Forts that have confirmed or possible historical connections or sites that share many of the attributes of the 'nuclear/complex' definition
Possible	Forts that have some of the attributes with no historical connection

1.10 Post-Excavation

Dating strategy focused on dating samples of occupation layers found near the base of rampart walls. These contexts were preferred in an effort to determine the date of the rampart walls, specifically those of the innermost enclosure. Each soil sample was hand flotated by the author with help from Dr. Gordon Noble picking the most likely datable charcoal from the significant contexts to send off for radiocarbon dating to Queen's University Belfast. This was also done with faunal remains with Dr. Edouard Masson-MacLean selecting the best samples for dating. The soil samples were floated to remove the charcoal and bone fragments from the soil. The samples were then laid out to dry and placed within bags to be sent off for processing.

During this time Data Structure Reports (DSRs) were written by the author, Dr. Gordon Noble, Dr. James O'Driscoll, and Dr. Edouard Masson-MacLean. These reports discuss the basic information on the site and the reason for excavation. They then detail the excavation results with tables of all soil samples, stratigraphic layers, and finds at the site.

1.11 Visibility and Photogrammetry

Drone survey was conducted on many of the sites in this database. The author as well as other members of the Northern Picts Project went to sites within the database and surveyed the sites which then were put into the program Pix4D where a dtm (digital terrain model) and an orthomosaic model were created (figure 1.1). These were then put into ArcMap where a hillshade model was created. With the hillshade model, it is easier to identify the enclosing elements of the site.

Each site was then planned with some based off pre-existing plans. For example, sites such as Dundurn in Perthshire have had numerous surveys and the author redrew the plan from past work. Sites that were surveyed by drone by the author were drawn using Affinity Designer. Some of the photogrammetry models uncovered unrecorded enclosing elements. Other sites were planned using LiDAR, specifically sites in the Scottish Borders where there is better data for LiDAR. The plans are found within **the database**. These plans were then analysed and compared to determine whether any noteworthy similarities or differences could be discerned amongst them.

After the creation of the database, all sites were mapped onto a digital terrain model of Scotland. Other datasets of early medieval sites such as square barrows, churches (that are early medieval, have been suggested to be early medieval, or structural remains that possibly could have been from the early medieval period), carved stones, and others were also placed within the map. These datasets came from Canmore. Landscape maps were created for each fort as well as visibility models. These visibility models were created by placing numerous points within the fort to create a larger visibility model, not just from one static point on the fort. Each fort's visibility model is found in the fort appendix.

This chapter gives a brief overview of the methods and analysis for this database and work. The database itself is found within the appendix online at https://doi.org/10.30861/9781407364292-Appendix, which discusses more detail on each fort within the database.

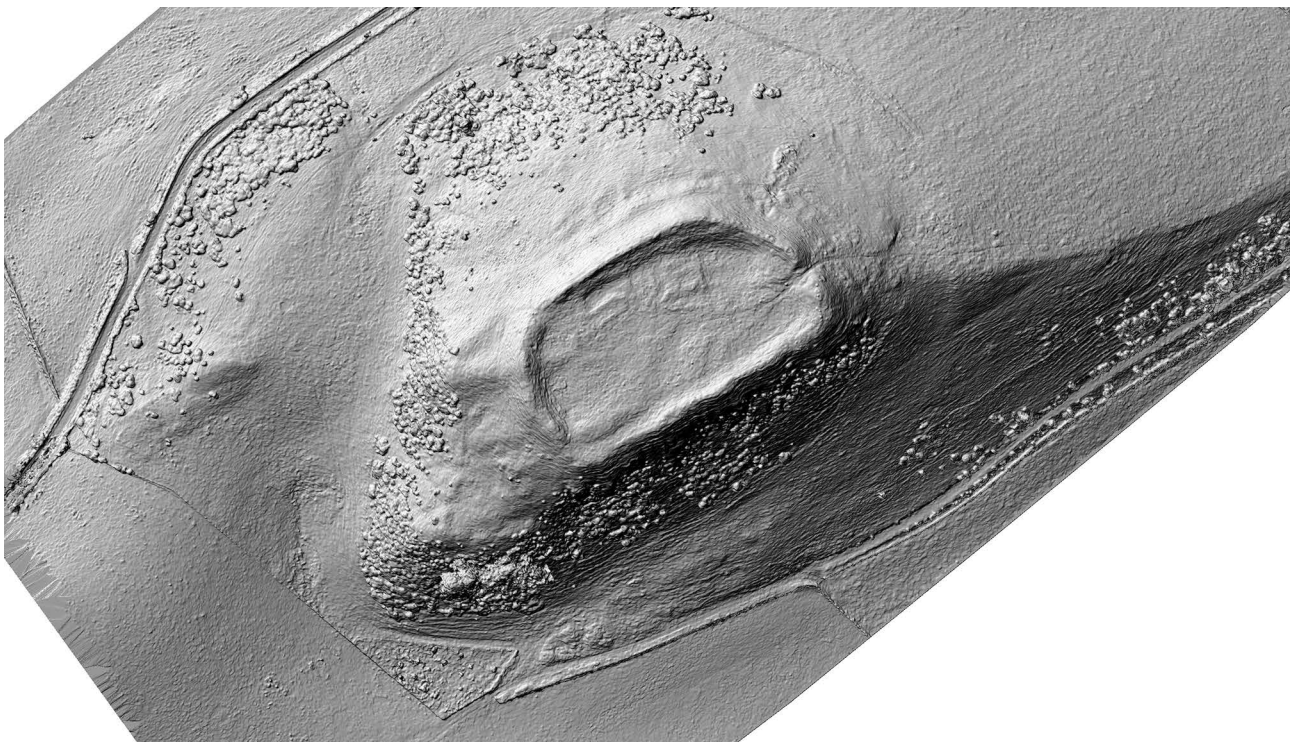

Figure 1.1 Example of hillshade model (Denoon Law)