

NORTHLIGHT HERITAGE



NORTHLIGHT HERITAGE	Killearn Glen Heritage Project
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DATA STRUCTURE REPORT	



Green Aspirations
Scotland CIC



Data Structure Report
Prepared on behalf of
Killearn Community Futures Company (KCFC)

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Cover Plate: Volunteers recording one of the 'Hollow Ways' during the training day, 10th April 2016.

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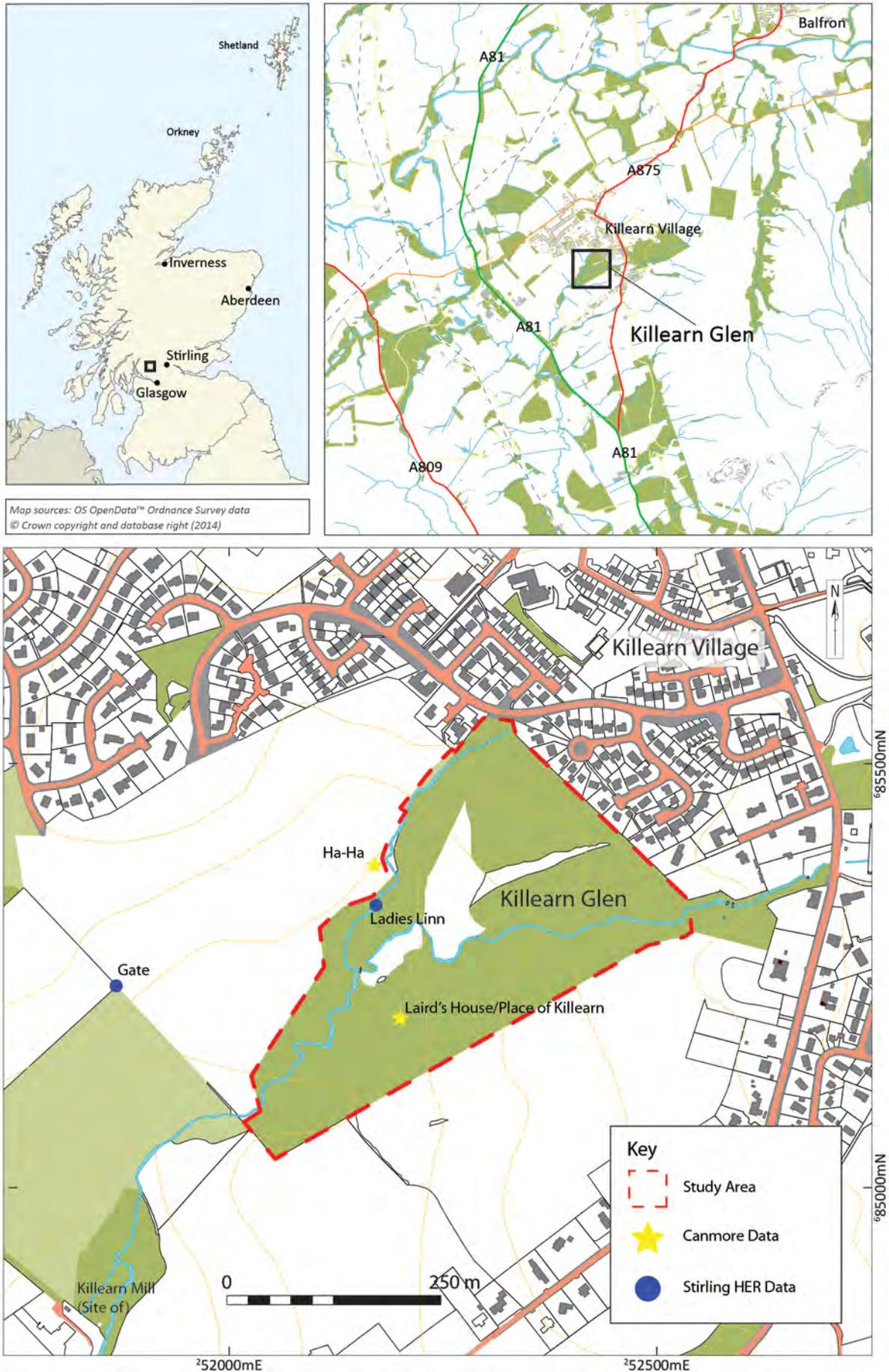


Fig. 1: Site Location

Abstract

This report presents the results of an archaeological walk over survey, rapid assessment and characterisation of the historic woodland and a dendrochronological study of three tree specimens all in Killearn Glen, next to Killearn Village, Stirlingshire as part of the 'Killearn Glen: Rediscovering the Communities' Lost Landscape Project'. The work was carried out across four days of activities between 10th April and 8th May 2016 with members of the local community and Killearn Community Futures Company (KCFC) archive group and others from further afield. A total of 22 individuals were engaged with throughout the project, in addition to Green Aspirations Scotland CIC who organised community woodland activities and workshops in the Glen.

Twelve new archaeological sites were identified throughout the woodland by the walk over survey, potentially spanning the Late Medieval to Modern periods.

The woodland survey transect confirmed that the woodland in Killearn Glen is diverse in tree age, form and species. The dendrochronology identified Scots Pine and Yew that date to the late 18th or early 19th centuries, and a coppiced oak that was last cut in the inter-war period - providing clues to the management of the woodland over the past two hundred years.

1. Introduction

1.1

The local community through the Killearn Community Futures Company (KCFC) secured a small Heritage Lottery Fund grant to assess the woodland and undertake various community projects within it. The heritage project was developed, with the support of the Stirling Council archaeologist, as part of this broader scheme of community engagement, 'Killearn Glen: Rediscovering the Community's Lost Landscape', organised on behalf of the Killearn Community Futures Company by Green Aspirations Scotland CIC. The archaeological and woodland heritage surveys were designed to undertake an assessment of the archaeological and historic woodland assets surviving within Killearn Glen.

1.2

This report presents the results of an archaeological walk over survey, rapid assessment and characterisation of the historic woodland and a dendrochronological study of three tree specimens all in Killearn Glen, next to Killearn Village, Stirlingshire as part of the 'Killearn Glen: Rediscovering the Communities' Lost Landscape Project'. All the work was carried out between 10th April and 8th May 2016 with members of the local community and Killearn Community Futures Company (KCFC) archive group. The work was carried out with Killearn Community involvement on behalf of KCFC along with Green Aspirations Scotland CIC who organised community woodland activities and workshops in the Glen.

1.3

Training in archaeological walk over survey was provided for the volunteers on Sunday 10th of April, and the walk over survey was carried out on Saturday 23rd and Sunday 24th April. Dr. Coralie Mills from Dendrochronicle also conducted an historic woodland survey on Saturday 23rd April and dendrochronological coring on Sunday 8th May. The field work was then followed by a public presentation of results and consultation for future project(s) on Saturday 11th June 2016.



Plate 1: The project team on the final day of field work. (© Jo Edwards, Lucidity Images)

2. Location, Geology and Topography

Location

2.1

Killearn Glen forms the Stirling Council owned half of a 17th / 18th century designed landscape to the south of Killearn village. The Glen is a roughly trapezoidal shape in plan on a roughly north-east to south-west orientation and is now bounded along its north-western edge by a large field of rough pasture with a spread of isolated trees formed from remnants of parkland. To the south and south-east of the wood it is bounded by open fields, which appear to be currently used as pasture but may have been cultivated in the relatively recent past. The north-eastern side of the woodland is now bounded by a housing estate that was open fields until relatively recently.

Geology

2.2

The area surrounding Killearn Glen is dominated by two broad types of sandstone bedrock. The Kirkhouse Burn broadly lies along the division between the two, but the sandstone to the south of the burn is part of the Stockiemuir Sandstone formation formed circa 359 to 385 million years ago, while the higher ground to the north of the burn is part of the Teith Sandstone formation which is slightly older, having been formed circa 398 to 407 million years ago, both during the Devonian Period. The superficial geology of the whole area is dominated by glacial deposits of Devensian Tills formed within the last 2 million years (BGS, 2016).

Topography

2.3

Lying immediately outside the Loch Lomond and Trossachs National Park, the area of Killearn Glen shares the same post glacial topographic features as the lowland areas of the National Park which were formed by the retreating ice sheet and glaciers, some 10,000 years ago, of the Loch Lomond Re-advance glaciation. Killearn Village occupies a natural, broad terrace above Strathblane to the west and to the south of the village Killearn Glen nestles in a depression cut by streams and rivers that have carved deep gorges into the sandstone bedrock, forming what is now called the Kirkhouse Burn and others. The natural platforms between the gorges

are now occupied by reasonably dense woodland for the most part with occasional clearings, but in contrast to the open fields and pasture to the north-west and south-east.

3. Summary Objectives

The objectives of the walkover were:

- to conduct a rapid desk-based assessment comprising identification and review of archaeological and heritage assets relating to Killearn Glen from documentary and cartographic sources;
- to undertake a walk over survey with the assistance of volunteers, principally drawn from the local community and to provide them with suitable training and support;
- to identify the location, nature and extent of any hitherto unrecorded features or objects of archaeological significance;
- to undertake an assessment of the surviving archaeological and historic woodland assets of Killearn Glen;
- to propose appropriate recommendations for further investigative, consolidation work and/or future management of the woodland.

The objectives of the woodland survey and dendrochronology were to:

- offer training opportunities in recording and interpreting the woodland heritage of the glen;
- assess what is most interesting and significant in historic woodland terms;
- undertake dendrochronological analysis of two trees to augment the assessment;
- make recommendations for further stages of work.

4. Methodology

4.1

The project was divided into three principal stages of activity:

Stage 1: Desk-Based Assessment

Stage 2: Field Survey (Walk Over Survey, Woodland Survey & Dendro-Coring)

Stage 3: Analysis (GIS)

4.2

The desk-based assessment comprised a rapid identification and review of archaeological and heritage assets relating to Killearn Glen from documentary and cartographic sources, including: local and national historic environment records, cartographic sources held at the National Library of Scotland and a preliminary search of the online holdings of the National Archives of Scotland. As well as providing a broad archaeological and historical context to Killearn Glen, the results of Stage 1 were used to assist the assessment of the significance and age of the surviving archaeological and woodland features (see Section 3. Archaeological and Historical Context).

4.3

Guided by the results of the desk-based assessment, the field survey in Stage 2 comprised an initial training day for volunteers in walk over and measured survey, introduced them to basic principles and techniques and combined these with practical sessions.

4.4

The volunteers were then supported to undertake a reasonably comprehensive walkover of Killearn Glen over a separate weekend. Features and structures previously recorded, as noted on the local and national historic



Plate 2: Training in background research, cartographic evidence. (© D. Clark)

environment records (see above), were noted but not re-recorded in any detail. Identified features and structures were located using handheld GPS, and recorded using standard pro-forma recording sheets and high resolution digital photographs.

4.5

The analysis of the field work results in Stage 3 was undertaken using appropriate techniques including compiling data into GIS software (QGIS version 2.14 *Essen*). This enabled the manipulation and geo-referencing of historic mapping, and plotting the results of walk over and woodland survey data on these maps. An analysis of the character and extent of archaeological and woodland assets was therefore possible, in addition to facilitating a reflection on how these features and structures inter-related with each other, in terms of the designed garden and wider landscape, and the broader issues of woodland management and natural processes of regeneration and change.

Woodland Heritage & Dendrochronology

4.6

The main assessment of the historic woodland was conducted by surveying a longitudinal transect through the woodland, following the slope down along its longest axis (Figure 3). This provided an opportunity to train volunteers in tree recording techniques, as well as giving a reasonable overview of the variation in tree cover through the glen.

4.7

The survey involved marking out a transect line with canes, and then recording each tree encountered along the transect. For each tree, the GPS location, species, girth, and form were recorded (Appendix 1, Table 4). Peter Quelch and Dr. Coralie Mills also made more general observations during the survey.



Plate 3: Dendrochronology coring in progress at tree KLG02. (© N. McNab)

4.8

Our conclusions are also informed by the Woodland Management Plan (Hyde 2016) and by additional tree survey work undertaken by Gill and Peter Smith, who have surveyed GPS locations for notable trees, especially those in the relict designed landscape in fields adjacent to the wood in the glen, shown on (Figure 4).

4.9

A presentation on woodland heritage and dendrochronology was given by Dr. Coralie Mills, on Sunday 8th May, followed by dendrochronological sampling undertaken with the assistance of members of the local community and Northlight Heritage.

4.10

Three trees were sampled by coring; a very tall Scots pine (KLG01) growing from low down in the gully, a coppiced oak (KLG02) beside one of the possible hollow way features, and one of the yew trees (KLG03) near the Ladies Linn. Their locations are shown on Figure 3 and more details about them are listed in Table 2 and Appendix 1, Table 4.

4.11

The cores were taken to the Dendrochronicle lab where they were taped to mounts, and gently air dried before being glued into the mounts and sanded to reveal the ring patterns.

4.12

The ring width series of each sample was then measured on a Heidenhain stage under a low power microscope, using the DENDRO software suite (Tyers 1999) to obtain an accurate ring count and a record of the ring pattern.

4.13

The cores got close to but did not hit centre so 'pith offsets' were made using an overlying transparency of concentric rings to give a good estimate of how many more rings would be present to centre. A further

estimate was made of how many years it would have taken the sapling tree to reach the sampling height. In this way a reasonably precise age estimate can be made for each cored tree.

4.14

The actual vertical growth rate would depend heavily on the degree of grazing pressure on the saplings as well as other local environmental factors and the species of tree. One can argue for a vertical growth rate between 10 cm and 20 cm per annum, with both alternatives used in reaching the estimates of tree birth dates listed in Table 2. In this way the ring counts from the cores were adjusted to give a reasonably precise estimate of the age of the sampled trees. Given many of the trees present must have been planted, we should also bear in mind that the planting-out date rather than the sprouting date is what we seek in terms of woodland history. Historically, well grown nursery specimens were probably planted out at between 3 and 5 years of age, but older nursery-grown saplings were used where their growth was not so good (Boutcher 1775; Brown 1847). If we assume the saplings were 1m tall when planted out, then the age including the pith offset gives us a close estimate of the likely planting out date (Table 2).

5. Archaeological and Historical Context

Statistical Accounts of Scotland

5.1

The [old] Statistical Account of Scotland (Ure 1791-99, 100-129) briefly describes the 'Place of Killearn'. Referring to the Laird's Seat, which sat adjacent to Killearn Glen as we now see it, under the subheading 'Gentlemen's Seats, etc.' he writes (sic.):

"About a mile and a half south of the village is the *Place of Killearn*, anciently the seat of a cadet of the Montrose family, but lately of Robert Scott of Killearn, Esq; and now the property of the Right Hon. James Montgomery, Lord Chief Baron of Scotland. The present edifice, which is far from being large, was built in the year 1688. Numerous plantations, regularly disposed in form of clumps, belts, and wildernesses, beautify and shelter an extensive tract of pleasure ground around the house."

5.2

Ure later goes on to discuss the trees in the immediate vicinity and grounds of the 'Place of Killearn' in detail, and draws a picture of an area of well-developed woodland with a wide variety of species, many of which had reached a great size, although he concentrates on the elder and larch – the latter of which he claims were amongst the first larches to be planted in Scotland.

5.3

The New Statistical Account of Scotland (Graham 1841, 60-71) also discusses the origin of the trees and woodland at the Place of Killearn, recapping much the same history as the Old Statistical Account. Graham (*ibid.*) does discuss possible inaccuracies in the Old Statistical Account in relation to the size of various trees around the Place of Killearn based on a series of trunk measurements, but what he could not have factored in, at that time, were changes in climatic conditions during the early part of the 19th century:

"These trees are all in vigorous growth, yet the increase during forty years is inconsiderable."

5.4

These sources generate a picture of the Place of Killearn as a densely wooded area, although in a more formal manner during the 18th century to the 19th century. What is missing is any direct reference to Killearn Glen or

any specific landscape features. The New Statistical Account does, however, mention that “every glen and ravine is covered with copse wood”. This is embellished with a description of landowners converting oak woodland plantations to copse and actively coppicing approximately every twenty years.

National Records of Scotland

5.5

A summary search of the holdings at the National Records of Scotland was carried out on their online search engine. The search parameters were defined quite broadly: Phrase = 'Killearn'; dates between '1650' & '1900'. This returned 169 results, one of which was disregarded as it specifically referred to Aberdeen.

5.6

These results were rapidly graded based on the title and how likely it might be to yield information on the Place of Killearn and / or its estate. Sixty-four results seemed of no relevance, fifteen showed indications of being of some relevance, thirty-one of relevance and fifty-eight of significant relevance. It was beyond the scope of this project to follow up on this any further.

Historic Environment Records

5.7

A review of the extant records for Killearn Glen held on Canmore (Historic Environment Scotland’s national historic environment record) and the Stirling Councils regional historic environment record, reveals only 4 distinct sites within the immediate vicinity of the Glen (see Table 1, ‘The Laird’s house’ appears twice, as it is listed on both datasets), and one archaeological intervention (see Table 1 – in italics). Only one of these ‘sites’ actually lies within the Glen.

<i>Dataset</i>	<i>Dataset UID</i>	<i>Name</i>	<i>Easting</i>	<i>Northing</i>	<i>OS NGR</i>	<i>Classification</i>
Stirling HER	7076	Place of Killearn gateway	251868	685238	NS 51868 85238	Gate
Stirling HER	7077	Place of Killearn, Ladies' Linn	252172	685333	NS 52172 85333	Designed Waterfall
Stirling HER	1915	Place of Killearn	252170	685380	NS 52170 85380	Laird's House
Stirling HER	1915.01	Place of Killearn	252170	685380	NS 52170 85380	Geophysical Survey
Canmore, HES	348782	Killearn	252170	685380	Ns 52170 85380	'Ha-Ha'
Canmore, HES	86382	Killearn	252200	685200	Ns 52200 85200	Laird's house = Place of Killearn

Table 1: extant historic environment records

5.8

Plotting these sites on a map reveals errors with the Canmore grid references. They locate the site of the ‘Ha-Ha’ just outside of the woodland on the same site as the Place of Killearn (the Laird’s House) as defined by the Stirling Council HER, and the Place of Killearn (the Laird’s House) in the middle of the woodland, rather than just outside.

Cartographic Sources

5.9

The earliest representation of Killearn on a map is Pont's late 16th century map of Scotland, 1583-1596 (Appendix 5, Plate 15), using his 'castle' symbol with the place name adjacent. Pont's map provided the principal reference for Blaeu's map of Scotland, 1654 (Appendix 5, Plate 16), although Blaeu added the detail of the 'Kirk of Killearn' with church symbol, the village name and a labelled symbol for the Mill which lay to the south-west of Killearn Glen. Herman Moll, 1745 (Appendix 5, Plate 17), also only depicts a church symbol with the place name, but none of these early maps gives any detail of the woodland in the area around Killearn.

5.10

Killearn Glen and its woodland are depicted for the first time on General Roy's map, 1745-52 (Appendix 5, Plate 18). This shows a narrow strip of woodland bounded to the north-west by a meandering burn and a perfectly straight boundary to the south-east, possibly a wall, with a building(s) to the immediate north-west of the burn surrounded by a formal garden, the design for which is reminiscent of the Union Flag. The short ends of the woodland, to the north-east and south-west, are shown as straight sections of boundary, and the overall impression is that of a rectangular, enclosed woodland exclusively on the south-east side of the Kirkhouse Burn. This has caused some confusion over the interpretation of exactly what Roy is representing on his map in relation to the Glen as there is only one burn shown – rather than the main Kirkhouse Burn with four distinct tributaries that can be seen today. The house or structure shown to the north-west of the woodland is assumed to be the 'Place of Killearn', built in 1688 (see 5.1). Several other woodland features are represented, including a 'bottle-shaped' area that appears to have had internal rides and/or vistas intersecting it.

5.11

Other notable features of the Roy map include the general lack of woodland in the wider landscape, apart from the glen woodland and the formal designed wooded features at Killearn. While Roy should be viewed as an impressionistic sketch rather than a full detailed survey, it is evident that the woodland at Killearn must have been a valuable and rare resource in this 18th century landscape.

5.12

Another notable aspect of Roy's map is the number of small townships scattered across the landscape, with the character of a pre-improvement settlement pattern, including places like Townhead on the immediate eastern edge of the glen woodland. Many of these small settlements have disappeared by the time of the first edition OS mapping in the mid 19th century.

5.13

Early 19th century maps such as Arrowsmith, 1803 (Appendix 5, Plate 19), Grassom, 1817 (Appendix 5, Plate 20), Ainslie, 1821 (Appendix 5, Plate 21) and Thomson, 1832 (Appendix 5, Plate 22) are at a much smaller scale than Roy or later Ordnance Survey maps. They have enough detail, however, to give an impression of a grand house, most likely the Place of Killearn, surrounded by dense patches of woodland, mainly to the south-east and south-west of the house, the village, public roads etc. but there is still only a single 'river channel' shown within the woodland. Grassom 1817 and Thomson 1832 both show Killearn Mill just to the south of the glen wood, which would have been fed by the Kirkhouse Burn.

5.14

The first edition Ordnance Survey map of 1864-65, surveyed 1861-62 (Appendix 5, Plate 23) shows a landscape much more familiar to a modern eye. Any trace of the 'Place of Killearn' had apparently gone at that stage and the footprint of the Killearn Glen woodland had reached its current extent, covering the full breadth of the burn system. Many of the woodland elements relating to the former designed landscape, particularly to the west of

the Glen, were still present, including the distinctive remnant of the 'bottle-shaped' plantation, although most of this has been lost over more recent decades under housing development. The overall impression of the landscape to the south-west of the village is one of 19th century 'parkland' with scattered trees across pasture. It is unclear whether the status of 'parkland' represented the principal use of the Glen, as there is also a well marked near the northern corner of the wood, adjacent to where Beech Drive is today, with access from 'Crosshead Farm'. It is important to note that the first edition Ordnance Survey map is the first formal record of we currently have for Ladies Linn or the so called 'Tea House' (see section 5.18). However, it is not clear that the Ladies Linn relates to the designed waterfall until it appears on the second edition Ordnance Survey map as this appears to be the name for the whole woodland (see below).

5.15

The 1918 second edition Ordnance Survey map (Appendix 5, Plate 24) is very similar to the first edition, but with a few important differences. One of the most obvious is the clear indication of variable tree and understory cover within the area of the Glen. The area in the northern part of the Glen that is predominantly covered by grass and bracken, forming a clearing in which the ornamental bench sits, is shown here, on the 1918 edition. To the south of this, on the south-east side of the Kirkhouse Burn is a long blank space, defined by a dashed line, which has been the topic of much debate, but is quite likely to represent a temporary clearance in the tree cover. The well that appeared on the first edition is still marked with the same access path from 'Crosshead Farm', but no sign of this was seen on the ground. The name for the woodland on this map is Killearn Glen (its first formal use); where as the Ladies Linn is used to relate just to the waterfall adjacent to the north-western edge of the woodland.

Previous Archaeological Work

5.16

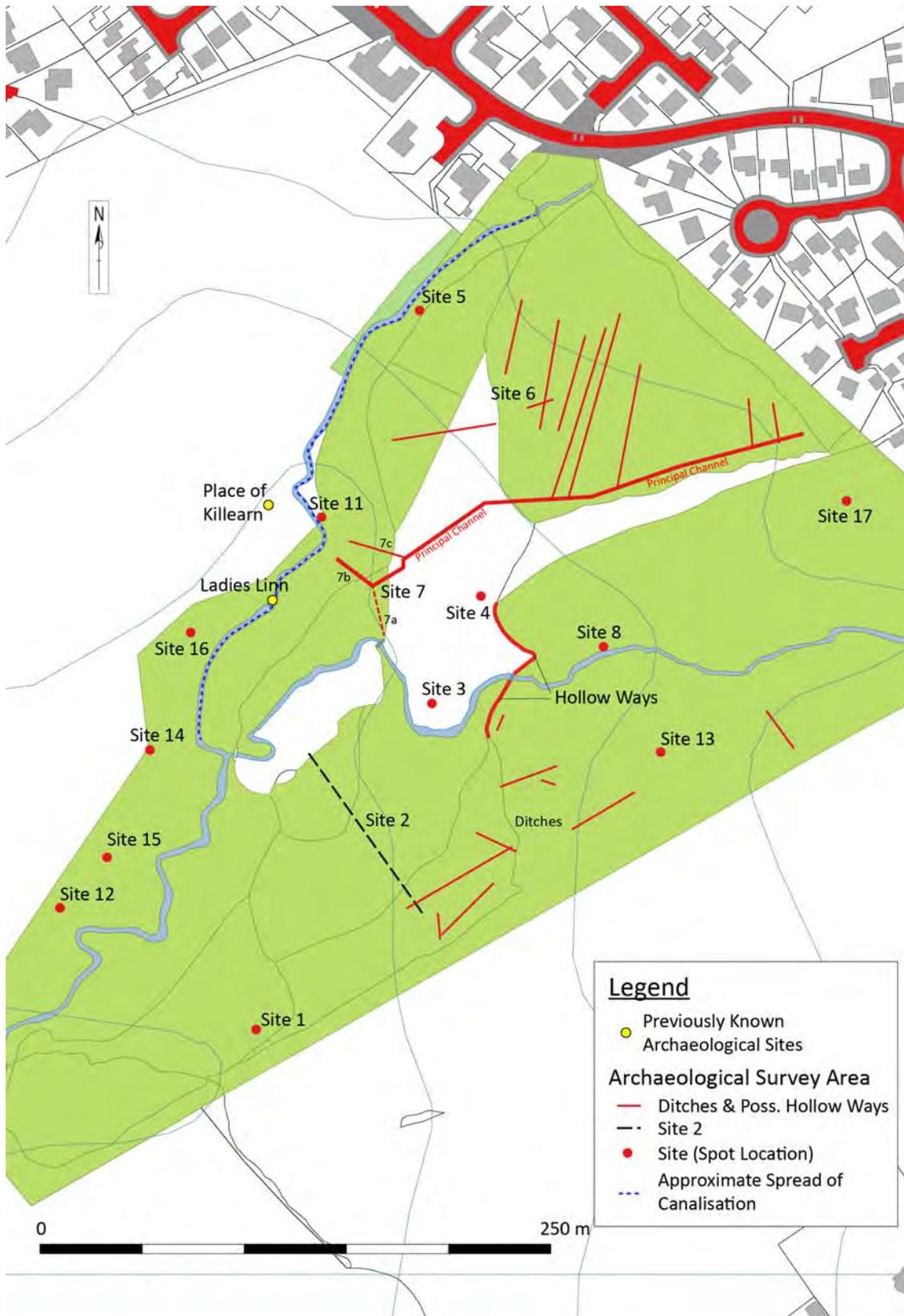
A Geophysical Survey was undertaken by Glasgow University Archaeological Research Division (GUARD) in 1993 on behalf of the Killearn Trust. They conducted a small resistivity survey, covering a total of 2400 m², of the supposed site of the 'Place of Killearn' house within the open field immediately to the north-west of Killearn Glen. This survey concluded that it had probably located a large rectangular structure with possible adjoining structures and walls within the surveyed grids. This was suggested to most likely be part of the 'Place of Killearn'.

5.17

In 2012, a series of test pits were excavated across the supposed site of the Place of Killearn by Murray Cook, Archaeologist for Stirling Council with Northlight Heritage, in addition to a walk over survey of the surrounding area as part of a community research programme. The test pits confirmed the presence of a substantial stone structure, most likely the Place of Killearn, although the walls had been extensively robbed out. It also identified a formal staircase linking the house to the Ladies Linn amongst several other features of various dates (Cook 2013, 176).

5.18

In 2013, further small scale excavations/test pits were excavated by the same team as a continuation of the community research programme. This time the excavations concentrated on the site of a revetment wall, a supposed 'Ha-Ha' just inside the north-western edge of the woodland near the Ladies' Linn (cf. Table 1). This identified a small structure apparently built into the wall that has become known as the 'Tea-House'. This small structure appears on the first edition Ordnance Survey map as a rectangular annex to the line of the revetment wall. It was more formally interpreted, by the excavators, as a likely location for a set of steps leading down from the level of the field to the terrace above the Ladies' Linn (Cook 2014, 180)



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Fig. 2: Archaeological sites found

5.19

Over a number of recent years, a few members of the KCFC Archive Group have undertaken a survey of the trees, within the open field to the north-west of Killearn Glen, to try to understand the development of the formal gardens and parkland as seen on the cartographic evidence and described in the Statistical Accounts. We have kindly been granted access to this data and it has been incorporated into the GIS analysis as part of this project.

6. Results

Archaeological Walk Over Survey

6.1

A total of fifteen distinct sites were identified and recorded during the walk over survey of Killearn Glen. Of those fifteen, only two had been previously recorded as part of the archaeological record in some way (see Figure 2).

6.2

Site 1 was identified as a small reservoir, probably for Killearn Mill which was located further downstream. Found to be in reasonable state of preservation, although heavily silted up, the reservoir was predominantly surrounded by deciduous woodland with bluebell and bracken undergrowth and marsh plants present across the infill material. It is defined by a large boggy depression circa 38 metres long by 15 metres wide, with evenly sloping banks on all sides and fed by a small stream/ditch at its eastern end. The outflow sits at the south-west end where there is a sudden drop to a small tributary of the Kirkhouse Burn below through a narrow and quite deep channel where there is some evidence of stone work suggesting the former presence of a dam or sluice.

6.3

A bank and ditch (Site 2), up to 3 metres wide, was identified and thought to be of post-medieval date, laying approximately perpendicular to the south-eastern boundary wall of the woodland. It is orientated circa north-west to south-east and extends circa 120 metres from just inside the boundary wall to the break of slope above the Kirkhouse Burn ravine. It was noted that the vegetation coverage to the north-east of the bank and ditch predominantly consisted of birch trees and marshy understorey, whereas to the south-west it was predominantly scots pine and oak in less dense woodland with numerous grassy areas. The ground in the immediate vicinity of the bank and ditch was very boggy.

6.4

A naturally formed oxbow lake (Site 3) was recorded during the survey and originally thought to be a man-made feature relating to water management. It has been noted that the shape of the burn as shown on the first edition Ordnance Survey maps matches the shape of the oxbow lake.

6.5

A rectangular structure (Site 4), circa 10 m by 5 m, is thought to represent a possible dwelling of some sort, and was identified during the survey on the north-western edge of a narrow re-entrant between the Kirkhouse Burn and a small tributary immediately to the north. The structure sits on what is now the very edge of the re-entrant probably due to natural erosion along the steep-sided, narrow ravine of the tributary. The upper surface of the small plateau is gently sloping, with a western aspect and covered in reasonably well-spaced trees with a dense bluebell and grass understorey. The structure itself appeared at first to consist of earthen banks, but was later realised to also consist of red sandstone masonry, some of which is well dressed. The primary structure may be sub-divided by an internal dividing wall, and is apparently abutted on its north-eastern end by a small rectangular annex, circa 3 m by 3 m.



Plate 4: The mill reservoir (Site 1) from its southern end.



Plate 5: The rectangular structure (Site 4) from its south western corner. (© P. Smith)

6.6

A possible bridging point (Site 5) was found approximately 80m from the northern entrance to the woodland where the burn is circa 4 m wide. There is evidence of cutting into the bedrock with two distinct corners, one either side of the burn, that have been embellished and/or strengthened with dry stone walling. At this point the burn cascades, in 3 stages, down a drop of approximately 1 m, into a pool. It was noted that there appeared to be some collapsed, dressed stone blocks lying in the pool – possibly from the embellishment mentioned above. This possible bridging point and associated revetting was recorded as a sample of the lengthy canalisation observed along much of the northern tributary burn, including the area around the Ladies Linn and Site 11 (see below).

6.7

A complex network of drainage channels (Site 6) were identified across the area between the two northernmost tributary streams within the woodland. The principal channel within this network is a large channel with raised banks extending from the north-eastern boundary of the woodland, adjacent to the housing estate, to the area of Ladies' Linn where it apparently feeds northwards into the north-western tributary burn. This larger channel runs parallel to the tributary burn and gradually gets bigger from circa 0.5 m across to circa 3 m across. A series of smaller channels feed into this from its northern side, all orientated approximately perpendicular to the slope.

6.8

A complicated junction of various channels (Site 7) was recorded at the southern end of the woodland clearing on the narrow re-entrant between the two northern tributary burns. The larger channel (a continuation of Site 6) appears to split, with one spur, site 7a (circa 3 m wide) heading south and the other, site 7b, heading west (circa 5 m wide) into different tributary streams. The latter appears to show signs of a large land slip at the mouth of the channel.

6.9

A few metres north of the divergence of these two channels, a third, narrower channel, site 7c (c. 2m wide) splits away to the west and drops steeply into the north-western tributary burn. At the principal break of slope in this small channel, and at various points below it, several large blocks of masonry can be seen partially buried and in no particular order.

6.10

A possible quarry (Site 8) was recorded on the steep, northern bank of the Kirkhouse Burn, near the centre of the woodland. It comprised a rough semi-circular bowl or scoop in the bank circa 15 m across. On revisiting this site, it was realised to be a natural feature of erosion within the river system, and as such is not particularly significant.

6.11

A dry stone wall (Site 11) was identified on the open, confluence area of the north-western tributary, adjacent to the boundary of the woodland. It was predominantly built of sandstone and orientated approximately north-south. At its greatest, it was seen to survive to circa 1.5m high toward its southern end and gradually decreasing in height to ground level at its northern end. The wall is circa 0.5 m wide at its base, but narrows slightly towards the top, which is finished with semi-circular sandstone coping stones, where they survive, and a number of rotten fence posts were present on the western side of the wall. The southern extent of the wall is where it meets the burn, but there are indications this section of walling may represent a continuation of the wall on the other side of the burn which may make it a northern extension of the 'Ha-Ha' feature.



Plate 6: The junction within the lower drainage system (Site 7) from the south west.



Plate 7: The drystone wall on the flood plain of the burn (Site 11) from the south east.

6.12

Two parallel, horse-shoe shaped, ceramic field drains (Site 12) were identified protruding from the collapsing break of slope of the ravine above the Kirkhouse Burn, near the south-western corner of the woodland. The orientation of the drainage pipes indicates that they run directly under the adjacent tree on the boundary of the woodland and field to the north-west. The pipes appeared to discharge in to an open ditch which falls circa 7 m down to the burn.

6.13

A possible Saw Pit (Site 13) was identified near the south-eastern edge of the woodland on a gently sloping area with relatively sparse woodland. It consisted of a rectangular pit, circa 3 m long by 2.5 m wide and 0.7 - 0.8 m deep. Sharp breaks of slope form the upper edge with small banks arranged next to each edge, above near vertical sides. No indications of any 'structure', e.g. of wood or metal, was evident, but a possible entrance was present as an L-shaped, sunken channel circa 0.7m wide and 3m long, identified meeting its southern corner.

6.14

A distinct elongated mound (Site 14) was identified, toward the south-western corner of the woodland, extending from the level of the field beyond the woodland boundary, circa 8 metres down to the edge of the river channel. It was defined by ditches on either side, which were circa 2 m wide by 0.5 m deep. The mound was topped with large, multi-stemmed lime trees, which formed the end of a line of similar trees running across the open field on the west side of the woodland boundary. The north side of the mound has a shallower descent to the river with a ledge, or possible path, about 1 m wide running down as far as circa 2 m above the river. At the end of the possible path, what looked like several courses of stonework were visible in the river bank within a patch of erosion, but the provenance or function of this stonework remains unclear.

6.15

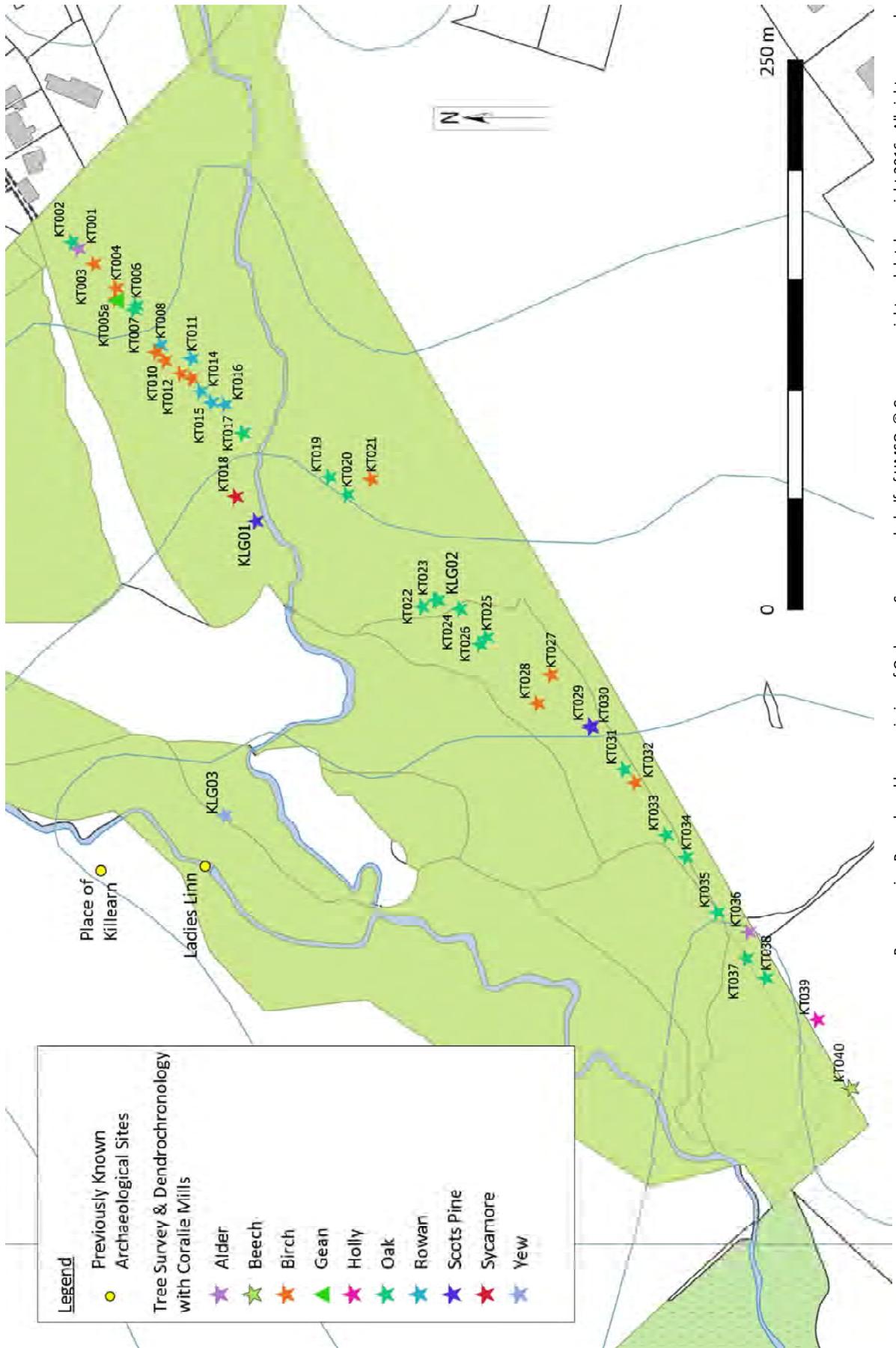
On a slight, south-east facing slope, just to the south of Site 14, three shallow, parallel ditches were identified with broad banks in between (Site 15) and probably represent remnant rig and furrow. The ditches were spaced approximately 11 m apart and the broad banks extended to around 0.5 m higher than the base of the ditches. The feature terminated at the sharp break of slope that is the ravine for the Kirkhouse Burn. At its western end, most of the feature extended only as far as the boundary fence between the field and woodland, but the southernmost bank may extend into the open field.

6.16

Just to the west/south-west of the Ladies' Linn waterfall a level, terraced area (Site 16) was identified between the revetment wall to the north-west and the break of slope on the bank of the burn to the south-east. The terrace is approximately 12.5 m wide adjacent to the Ladies' Linn waterfall, but narrows slightly along its length to the southwest. The terrace wall is the so called 'Ha-Ha' and the small inset building is the 'Tea-room' Structure as described elsewhere (see Section 5).

6.17

A mound circa 15-25 m in diameter (Site 17) was identified as a midden or refuse tip, in a relatively level area near the northern edge of the woodland. The edge of the feature is most distinct at the north-western and western limits. The remaining edges are poorly defined and merge into the woodland floor. A variety of glass and ceramic bottles were found across the top of the mound, all of which were late 19th or early 20th century in date.



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Fig. 3: Transect and coring tree locations

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6.18

The uppermost part of the transect started with an alder (KT001, Appendix 1, Table 4 and Figure 3) beside the entrance from Elm Road. This is one of a number of alders, some apparently coppiced, along a wet flush to the north west of the Kirkhouse burn, as noted in Compartment 1 in the WMP. Trees KT01 to KT19 inclusive are in that part of the transect which spans WMP Compartment 1 (Hyde 2016), and the species encountered include mature alder (e.g. KT001), mature oak maidens (e.g. KT002), young oak maidens (e.g. KT006 & 007), maiden downy birch (e.g. KT005a), multi-stem pendulous birch (e.g. KT009b), self-seeded single- (e.g. KT015) and multi-stemmed rowan (e.g. KT008), gean (e.g. KT005b), sycamore (e.g. KT018) and Scots pine (e.g. KLG01). While the oldest elements are likely to be 18th century specimen trees, much of the woodland cover is more recent regeneration (rowan and birch) or, in the case of the young c 30 year old maiden oaks, probably the result of planting. There are several instances of birch and rowan growing together out of decaying conifer stumps which are possibly of larch, evidence of an episode of felling in fairly recent times. This part of the transect ends at the north bank of the Kirkhouse burn, near pine KLG01.

6.19

The part of the transect south of the Kirkhouse Burn is dominated by oak coppice, and in large part coincides with Compartments 2 and 3 identified in the WMP (Hyde 2016). Trees KT020 to KT028 lie between the Kirkhouse Burn and the early bank (Site 2) and are mostly oak coppice with some multi-stem birch. The birch may have been coppiced as well as the oak. There are trees growing on the bank (Site 2) and its function as a boundary must pre-date most or all of the current tree cover.

6.20

Just below this ancient bank, the transect impinges slightly on WMP Compartment 6, a stand of pine, larch and spruce, with KT029 and KT030 both being pine trees. They do not look so large or old as cored pine KLG01.

6.21

From KT031 oak coppice dominates the transect record, corresponding to WMP Compartment 3. However, some other species are present including multi-stemmed birch (eg KT032), multi-stemmed alder on the burn-side (eg KT036), multi-stemmed holly (eg KT039) and at the southernmost end, in the south-west corner of the wood, the massive fluted beech tree KT040. While having the appearance of a bundle planted beech, PQ advises that this is a single-stem tree, the fluting being a characteristic acquired with age. There is another similar beech just west of it and they both sit on the same line as the lime-dominated avenue just to the west of the wood and south of the Place of Killearn (Figure 4).

6.22

Our observations made in assessing the tree cover and recording the transect informed the selection of trees for coring for dendrochronological analysis. With only two trees to be sampled it was difficult to reflect the diverse range of tree ages, species and forms present, and this is very much a pilot study to show what more extensive dendrochronological work could reveal. In fact, three trees were cored to improve our coverage. The selected trees are described further in Appendix 1, Table 4.

6.23

The Scots pine KLG01 was selected as it appeared to be amongst the older trees present, one of the specimen trees mentioned in the WMP within Compartment 1 (Hyde 2016). It grows very tall and straight from near the base of the Kirkhouse Burn's gully, on its northern bank. Given that pine would not have occurred naturally here, it must have been planted.



Plate 8: A close up detail of the horse shoe shaped, ceramic drains (Site 12).



Plate 9: The saw pit (Site 13).

6.24

The oak KLG02 was selected as representative of the oak coppice stools present, most frequent in the central and southern parts of the glen (in Compartments 2 and 3 of the WMP), to the south of the Kirkhouse Burn; one of its five stems was cored to find out when it was last coppiced. It is located immediately above one of the possible hollow ways in this part of the glen (Plates 3 & 10).

6.25

The yew KLG03, just east of the Ladies Linn (in Compartment 5 of the WMP) was selected because it is regarded as an element of the designed landscape around the former Place of Killlearn, located in that part which lies on the Stirling Council side of the land ownership boundary. It is one of a number of similar yews at this location, and from external observation this particular yew was selected because it appeared to be the least affected by rot.

6.26

The results of the dendro-analyses are given in Table 2. The pine KLG01 is demonstrated to be from late 18th century planting, in the 1780s, while oak KLG02 was last coppiced in the 1920s. There is less certainty regarding the yew KLG03 because despite its sound appearance, the heart was rotten causing the inner core to fragment, and all that is possible is to give an indication of a minimum age. This tree must pre-date 1843 and could be either 18th or early 19th century in origin. Many of the yew trees by the Ladies Linn were oozing black viscous stuff and are probably similarly affected by rot. Any further coring of the yews should proceed with caution, as it is in rotten trees that corers can become stuck.

Sample / species/ form	Sample height (m)	Total rings measured	Last measured ring date <i>Calendar year AD</i>	First measured ring date <i>Calendar year AD</i>	Pith Offset -Inferred date of central ring at sample height <i>(approximates to planting out date for pine & yew)</i>	Estimated sprouting date, assuming vertical growth rate of 10cm pa	Estimated sprouting date, assuming vertical growth rate of 20cm pa
KLG01 Scots pine - maiden	1.0	214	2015	1802	1787 <i>(PO-15)</i>	1777 <i>(10 years to reach 1m ht)</i>	1782 <i>(5 years to reach 1m ht)</i>
KLG02 oak coppice stem	1.0	76	2015	1940	1930 <i>(PO-10)</i>	1920 <i>(10 years to reach 1m ht)</i>	1925 <i>(5 years to reach 1m ht)</i>
KLG03 yew – maiden	1.0	118	2015	1898	Older than 1848 <i>(est. 30 rings present in un-measured fragmented rotten inner part of core - no curvature so some way off centre, say minimum PO-20)</i>	Before 1838 <i>(10 years to reach 1m ht)</i>	Before 1843 <i>(5 yrs to reach 1m ht)</i>

Table 2: Killlearn Glen dendrochronological results

7. Discussion and Summary

7.1

The walk over survey conducted during this project has added a significant amount to the history and archaeology of Killlearn Glen. In addition to the archaeological sites identified, we have learnt a reasonable amount about the natural processes of erosion that are still active along the river channel in the Glen, through the two sites of natural origin that were recorded. Site 3, located approximately in the centre of the woodland, is a dried-up section of river channel, called an oxbow lake, which can be confirmed by comparison of the modern course of the burn and the first edition Ordnance Survey map. The other, Site 8, is a natural area of collapse and erosion of the upper sides of the Kirkhouse Burn stream channel although we are unable to allocate a date for the last land slip in this area.

Late Medieval

7.2

Perhaps the most surprising discovery of the project has been the distinct possibility of a late Medieval phase of archaeology surviving below and within the extant woodland. The first of the sites that fall into this category is Site 14, the rig and furrow feature identified adjacent to the western edge of the woodland. It is an oddity, because this small patch of rig and furrow may only survive because of the woodland having been planted on top of it. In contrast is the area further to the west and north-west, beyond the woodland boundary, where no indications of rig survive on the ground surface.

7.3

Even more compelling is the discovery of the previously unknown, rectangular structure (Site 4) sitting above the small tributary ravine. This structure seems most likely to represent a dwelling, as it is of very similar morphology to dwellings excavated at Ben Lawers, which dated to the late 15th century AD (Boyle, 2003). It is not suggested that the structure in Killearn Glen is quite as early as those at Ben Lawers, but a late 16th or early 17th century date is plausible. The presence of red sandstone blocks as part of the structure is intriguing and, when considered together with the suggested date and location within the former estate of the 'Place of Killearn', might suggest that this represents a higher status structure – possibly the Laird's house that preceded the one built in 1688.

7.4

One of the hypotheses proposed prior to the walk over survey was the presence of 'hollow-ways' (sometimes called 'sunken lanes') throughout the Glen. Many of the channels to which this hypothesis had been attached, however, were ephemeral in nature and very unlike most hollow ways. They have been re-interpreted as drainage channels (see 7.11 – 7.13 below). Three sections of channel are, however, suggested to be hollow ways. The two sections either side of the new wooden bridge over the Kirkhouse Burn and a short, more indistinct section immediately to the north of Site 4. Considered together with the rectangular structure (Site 4), these channels appear to form a linear access to and from the structure across the burns via fording points. It is unlikely that these channels have ever been used as water channels, as no typical evidence for water erosion was identified along their course.

Post Medieval

7.5

Along the western edge of the woodland, three features were recorded that are considered to be Post Medieval in date. These are essentially those features which are thought to have been more or less contemporary with the 18th century gardens of the 'Place of Killearn'. Perhaps the most obvious of these is the broad terrace (Site 16) that sits above the Ladies' Linn waterfall. The exact date of this feature is unknown, but it is most likely to have been constructed at the approximately the same time as the revetment wall (also referred to as a 'Ha-Ha'¹) and the development of the waterfall as a decorative feature. How the 'tearoom' structure (see 3.15 above) relates to these other elements remains unclear, but it is suggested to have been the site of an access stairway leading to the terrace area from above.

7.6

There has been much debate throughout the project as to whether the Terrace, revetment wall, Ladies' Linn waterfall and related structures were originally built in the 18th, 19th or 20th centuries, and - whenever they were originally built – to what extent and how many times they may have been 're-imagined' or repaired. The

¹ The revetment wall does not represent a 'Ha-Ha' in terms of architectural and landscape design due to the lack of a ditch or continued vista to the south-east side of the wall. In addition, the ravine forms a natural barrier for livestock or traffic and so a 'Ha-Ha' would be a redundant feature at this location.

consensus reached would seem to suggest that the general scheme of the designed landscape does go back to at least the late 18th century, but may well have been extensively re-imagined during the early 19th century. At this point it seems likely that the estate was transformed from the formal, baroque style gardens into rustic parkland which was popular at the time. This would have echoed the construction of the new House of Killearn on the banks of the Blane River, nearby.

7.7

The dry stone wall (Site 11) identified just to the north-east of the waterfall appears to form a continuation of the revetment wall on the east bank of the burn. This interpretation was, at least initially, based on a close study of the first edition Ordnance Survey map. While it may continue the alignment, however, it is clear that Site 11 was not a retaining wall due to its small size and ephemeral construction. One suggestion has been that this section of wall doesn't relate directly to the revetment wall of the terrace, but instead is connected with the water management systems that appear to have been put in place in the late 19th century (see below). If the latter were true, it seems particularly odd that it should be built to respect an earlier feature on the opposite side of the burn.

7.8

More ambiguous yet is the elongated mound (Site 14) which extended over the edge of the ravine circa 50 metres to the south of the terrace. This has been defined and interpreted within the context of the alignment of trees recorded growing on the top of the mound and extending into the open field to the north-west. It is unclear whether this is an extension of the plateau created above the revetment wall or part of some other, more discrete garden feature - but it seems most likely to have formed some part of the 18th century formal garden.

7.9

The other features in this area that probably originate during this Post Medieval period are the ceramic field drains (Site 12) identified on the edge of the ravine. Ceramic field drains were first used during the 'improvement period', although they continued in use throughout the 19th and early 20th centuries.

Late 19th Century

7.10

The extensive series of small channels identified throughout the northern part of the Glen (Site 6), when mapped using handheld GPS, were seen to form a systematic network across the slope, orientated to work with the topography. The principal, arterial channel, into which all the others were connected, was identified as the source for the very large channels that made up Site 7. When viewed as a single feature, the whole makes sense as a water drainage and management system. This is emphasised by the spur channel (described in section 6.9) that contained large masonry blocks. It is probable that these masonry blocks were originally part of a sluice, or similar structure to control the flow of water. Probably associated with this system of water management, but located further down the Glen, was the in-filled mill pond or reservoir (Site 1), which also has indications of originally having been controlled by a sluice system.

7.11

The apparent canalisation of the northern tributary, which appears to include the possible bridging point (Site 5), is one of the more difficult features to place within a phased history of the Glen. It is, however, probably associated with the general scheme of water management within the Glen as seen in Sites 6 and 7. If this was the case, it seems unusual that the northern tributary is the only one that has evidence for canalisation and revetment.



Plate 10: One of the possible 'Hollow Ways' (Site 4) on the south side of the Kirkhouse Burn. The cored tree (KLG02) is located to the left of the photograph, at the top of the bank.



Plate 11: The 'Hollow Way' immediately to the south of the rectangular structure (Site 4).

7.12

The interpretation of these various features throughout the Glen is supported by an oral history account collected locally by members of the KCFC Archive Group (Peter Smith, pers. com.), which suggests that, at the end of the 19th century, the owners of Killearn Mill carried out extensive works to improve the water supply from the Glen in order to better power the mill. It is still unclear to what extent they built or excavated brand new infrastructure rather than enhanced and repaired existing structures.

7.13

Proposing a date of construction for the bank and ditch (Site 2) identified on the south-east side of the Kirkhouse Burn requires a little explanation. It first appears on the second edition Ordnance Survey map (1918) as a sinuous feature with rounded ends, but does not appear on the Ordnance Survey first edition (1865), and was initially thought to be late 19th century in origin on this basis. Its identification as the mapped feature, however, was only confirmed by topographic observations as the handheld GPS location of this feature, obtained during the field work, is inaccurate due to the dense tree cover. However, it is possible that it may have been built much earlier than late 19th century because the Dendrochronology data (see above) suggests the extant woodland growing on top of the bank was largely planted in the late 18th or early 19th centuries. Furthermore, it has been suggested that the bank and ditch may have extended underneath the boundary wall of the woodland in to the adjacent field, although no earthworks are visible on the far side of the wall to support this. What is more clear is its relationship to the ditch running along the north-west side of the boundary wall and when considered more widely in terms of its topographic relationship to the surrounding woodland it seems probable that the bank and ditch was created during the early to mid 19th century and intended as a woodland management and /or a drainage feature.

Modern/20th Century

7.14

Site 13, the possible saw pit on the south-east side of the woodland, is a fascinating glimpse into the relatively recent, yet forgotten, history of the Glen. Despite the saw pit being quite heavily eroded, the shape and function remain relatively clear. This feature represents a phase of forestry exploitation within the Glen that probably dates to the inter-war period (1920s or 1930s). This date is indicated in the results of the Dendrochronology undertaken as part of this project, which revealed the oak coppice in the vicinity of the saw pit had last been cut about then.

7.15

The most recent site or feature identified during the walk over survey is the midden (Site 17) identified adjacent to the north-eastern limit of the woodland. Some of the volunteers were aware that it had been used as recently as the 1950s, or possibly a bit later, and this was demonstrated by the assortment of glass bottles and a tin bath that were found strewn across the top of the pile. The size of the midden should be borne in mind, however, as this probably indicates that the midden was started decades earlier, possibly in the 19th century.

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7.16

Aerial photographs taken in 1946 (see <http://ncap.org.uk/>) are informative, as they show open grassland and sparser woodland cover in the north western portion of the wood than exists now. This makes sense of the two massive mature oaks with broad open-grown canopies at the northern end of the wood (see PQ's observations in Appendix 2). They must have originated in a more open parkland setting, and much of the smaller tree cover at the upper end of the wood, typified by rowan and birch, has to be recent regeneration, or in the case of the young oaks especially, probably the result of some fairly recent planting.

7.17

In the WMP (Hyde 2016) the massive open grown oaks are seen as specimen trees, as are the mature conifers such as the sampled pine KLG01 which our analysis shows was planted in the 1780s. It would seem reasonable to propose a similar late 18th century origin for those two massive open grown oaks at the north end of the wood. An oak tree of similar size and form was cored at south Loch Katrine and was found to be very fast grown and only early 19th Century in age (Mills, Quelch & Stewart 2009; Mills 2011), driving home the message that size can be mis-leading. Furthermore, not all of the maiden oaks in this northern section of Killearn Glen are as old as the 18th or 19th century; a large oak which fell in 2012 on the northern edge adjacent to the modern housing has been ring-counted in the field to only c 100 years old (Plate 12) and is therefore of early 20th century origin. Some other recently felled trees, including larch, felled for safety along path routes, have been estimated as having c 100 rings and there must be a cohort of trees across the wood of this sort of early 20th century origin.

7.18

Tree size can be deceptive, and one must look for other signs of ageing such as stag-headedness, where the boughs of deciduous trees die back and the canopy is reduced. The massive oak in the cow field (Plate 13), near the site of the Place of Killearn, is a good example of a stag-headed oak. It is probably one of the oldest trees present and could easily be 17th century. It could be the same oak as the one of 12 feet circumference mentioned in the 1790s First Statistical Account (Appendix 3). It is too large to core, but it would be feasible to obtain a minimum age from any fallen branches. It has an interesting form, as the trunk appears to be formed from fused multiple stems which have later been cut high to give the characteristic candelabra form of a pollard (Plate 13). The holly nearby (Plate 14) is probably of similar great age.

7.19

So far the oldest tree scientifically aged within the Killearn Glen woodland is the Scots pine KLG01. It is a very tall straight specimen growing from near the base of the Kirkhouse Burn gully. Tree ring analysis of the core sample shows that it was planted in the 1780s. Thus it was just a young sapling when the First Statistical Account was written in the 1790s, and is too young to have been present when Roy's map was drawn up in the mid 18th century.

7.20

The First Statistical Account mentions larches of c 60 years of age which adorn 'the banks and inclosures (sic)' of the house of Killearn (Appendix 3). The Account says they are amongst the earliest examples of larch planted in Scotland, already three feet in diameter and 100 feet tall by the 1790s. This reference must allude to the European Larch which was introduced to Scotland in c 1728 (Boulton & Jay 1946), as the Japanese larch and hybrid larches are a later 18th century development. While there are still larches in Killearn Glen, none of them appear to be as old as the early 18th century, and one recently felled example was ring-counted in the field to have c 100 rings (Gill Smith pers comm).

7.21

There are large conifer stumps in the upper end of the transect in which self seeded rowan and birch grow, and these stumps could potentially be from older larch specimens, either storm-thrown or felled within the last few decades. These stumps could be in the same age class as the cored pine tree, ie late 18th Century, or even younger, perhaps in the 100 year age class seen in the recently felled example. There is as yet no clear evidence of any of the really early larch surviving.

7.22

Dendrochronological analysis of a core from the oak coppice KLG02 demonstrated that it was last cut over in the 1920s, and that coppicing ceased thereafter. The sampled stool was very typical in size and form of the oak



Plate 12: Stump of large maiden oak, on the north west edge of Killearn Glen, which fell in the winter of 2011/12 and which has c 100 rings and thus originates in the early 20th century.



Plates 13 &14: Two of the oldest trees in the area: Plate 13 (L) The massive stag-headed oak and Plate 14 (r) the ancient holly beside the location of the Place of Killearn, just west of Killearn Glen wood.

stools throughout the wood, and it is likely that the coppice wood as a whole was last cut in the 1920s. Most of the coppice stools are quite compact even though the component stems are quite large and overgrown, and it seems unlikely that the oak stools are of great antiquity.

7.23

The Second Statistical Account for Killearn Parish, published in 1841 but written in the mid 1830s states that “There is little natural wood in the parish. The extent under plantation, is about 1,140 acres. The object of proprietors is to convert these plantations into copse, filling them entirely with oak, and cutting them, every twenty years: yet, as oak bark has fallen to about £8 per ton - less than half of the war prices, and as there is a growing demand for fir, especially larch, it is probable that the latter will be more extensively planted. The annual value of wood sold, is about £400. It may increase considerably beyond that sum, as a great part of the oak copse is not arrived at perfection. (sic)”

7.24

The use of the term ‘copse’ here means coppice. The implication is that the oak coppice in Killearn Glen was established in the late 18th or early 19th century, at the time when the value of domestic oak coppice products such as tan-bark and charcoal escalated to very profitable levels during the Napoleonic Wars (Stewart 2003; Mills 2011). If established in c 1800, the oak stools could have gone through about 5 or 6 typical coppice rotations of about 20-25 years (Gilchrist 1874) each in the intervening period. The archaeological feature interpreted as a saw-pit (Site 13) could easily date to the last coppicing episode in the 1920s, or perhaps has been in use even more recently given how fresh it looks. Two man saws continued in use until relatively recent times, within living memory, and chain saws did not come into widespread use until after World War II.

7.25

If the oak coppice hails from the Napoleonic Wars era, ie in the very late 18th or early 19th century, then what was the woodland shown in the Glen on Roy’s mid-18th century map? The only component we can identify with any certainty is the ‘great number’ of larch which were about 60 years old when the First Statistical Account was written in the 1790s (Appendix 3). We also know that there was a notably large oak tree present, with a 12 foot circumference by the 1790s. More generally, we know that “In the vicinity of the larixes are many beautiful spruce and beech trees, of uncommonly large dimensions. The oriental maple, the sweet chestnut and tulip trees have, in this place, arrived to great perfection and beauty”, First Statistical Account, see Appendix 3. Spruce and beech still occur in the wood, but only two beech trees, at the southern end of the wood, have ‘uncommonly large dimensions’. They appear to be a relict eastern end of a designed avenue of trees (mostly lime to the west of the Glen) which has been ‘swallowed up’ by the southern end of the glen wood. Most of the spruce and beech trees present now look too young to have been present on Roy’s map. As noted in the WMP (Hyde 2016), the oriental maple, the sweet chestnut and the tulip tree are no longer represented in the wood.

7.26

The greatest clue we have to the nature of the wood shown on Roy’s map is from the First Statistical Account of the 1790s which in describing notable places in Killearn parish says

“About a mile and a half south of the village is the Place of Killearn, ... now the property of the Right Hon. James Montgomery, Lord Chief Baron for Scotland. The present edifice, which is far from being large, was built in the year 1688. Numerous plantations, regularly disposed in form of clumps, belts, and wildernesses, beautify and shelter an extensive tract of pleasure ground round the house.”

7.27

All the evidence is pointing to a largely planted origin for the wood in Killearn Glen, which in the mid 18th century must have included larch, spruce and beech. Thus, as Peter Quelch says in Appendix 2, this is a historic

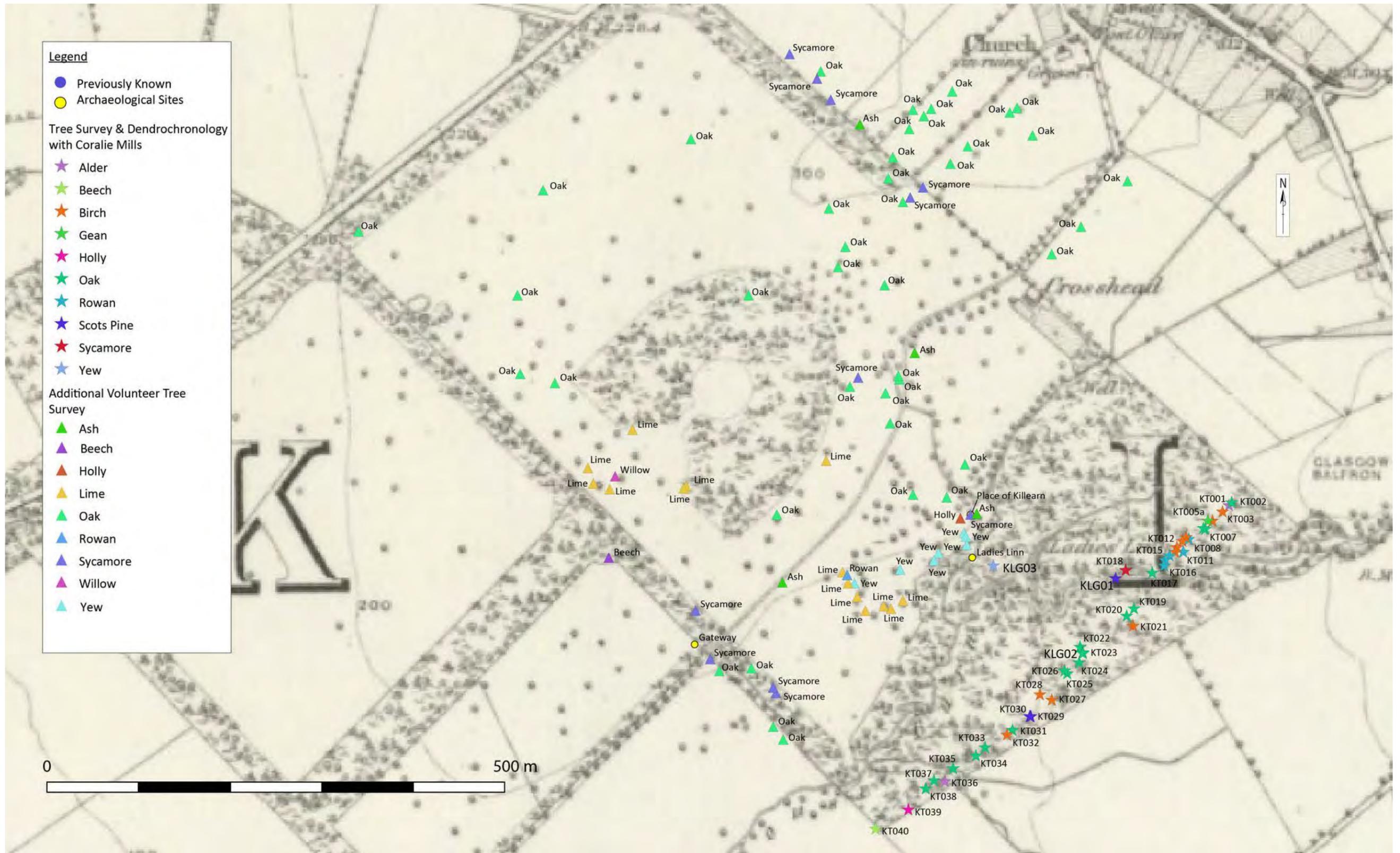


Fig. 5: All tree data superimposed on the first edition Ordnance Survey map

woodland, not an ancient natural woodland. In the WMP (Hyde 2016) it is described as semi-natural with some parts identified as LEPO (long established plantation origin). The more natural aspects of the wood are probably derived from residual semi-natural woodland in the steepest least accessible parts of the gully of the Kirkhouse Burn, where they would have been protected from grazing pressure. Even the oak coppice can be seen as likely to have a planted origin, given the evidence of the two statistical accounts and the tree-ring evidence that the last time coppicing was practiced was in the 1920s.

7.28

One interesting implication of the coppice dendro-date is that the coppice was being worked and harvested as part of a mixed species woodland, including conifers as well as deciduous species, because specimen conifers such as the pine KLG01 were definitely present while coppicing was being carried out. This points to careful small-scale forestry operations, able to target individual trees, and is a guide for any renewed forestry operations, including the possibility of re-starting coppicing in parts of the wood. The most natural elements now are in the more recent self-seeding growth of rowan and birch, as well as the spread of beech and sycamore saplings, the parent trees of which must have been planted. The WMP suggests eliminating these, but they have been a long-standing element of the ancient plantation that is Killearn Glen wood, and one could argue for their retention, or at least argue against their complete elimination.

7.29

So where are the oldest trees, if not represented by the oak coppice, and given the late 18th century date for the oldest of the cores obtained thus far (Scots pine KLG01). Probably the late 17th to mid-18th century trees are represented by the elements of the designed landscape around the former Place of Killearn, mainly in the cow field to the west of the glen, such as the ancient pollarded oak, its adjacent ancient holly and the mature lime trees on the Gordon Trust land, but with some elements which over time have become absorbed into the expanding footprint of the Killearn Glen wood, i.e. within the Stirling Council land. The two large beech at the southern end of the wood are potentially of this period, and the yew trees around the Ladies Linn might be too, and it would require more intact cores to determine that.

7.30

All the evidence from this project is pointing towards a largely planted origin for the woodland in Killearn Glen. Any more natural early components must have been limited to the steeper parts of the gully, inaccessible to grazing impact. The species likely to be represented on Roy's mid 18th century map include young European larch, spruce and beech, as well as the now lost oriental maple, sweet chestnut and tulip trees mentioned in the First Statistical Account. Larch, spruce and beech are still present today, but few of them appear old enough to have been present since the heyday of the Place of Killearn.

7.31

The glen woodland has spread into a wider footprint since Roy's map, when it is shown only on the east side of the Kirkhouse Burn, and combined with the evidence from the archaeological survey, we can see how features of more open ground such as an early rectangular structure (Site 4) and old broad rig (Site 15 at the NW end) have been absorbed into the wood and planted over. Much of this expansion happened after Roy's mapping and before the first edition Ordnance Survey of 1860-61, and echoes the history of other complex lowland woods (eg Balgownie Wood, Fife, Mills & Quelch 2011; Callender Wood, Falkirk, Mills & Quelch 2012). However, even more recent changes have occurred because the 1946 aerial photography shows the north west portion was still quite open even then, more akin to the parkland in the adjacent cow field around the site of the Place of Killearn.

7.32

The oldest tree for which we have dendrochronological evidence is the fine tall Scots pine, KLG01, down in a

steep part of the gully and planted in the 1780s. This shows that the planting was not confined to the flatter areas, and that the planting around the Place of Killearn continued for at least a century after it was built. The tree-ring evidence indicates the oak coppice was last cut in the 1920s (KLG02), and given the form of the stools, and the evidence of the Second Statistical Account, this coppice was most probably established in the Napoleonic Wars era, when domestic coppice products were very profitable, and arguably was not present when Roy's map was drawn up.

7.33

The age of the earliest designed landscape features is inferred from the date of construction of the Place of Killearn, and we have yet to sample any trees demonstrably from the later 17th or early 18th centuries. The yew KLG03 was too rotten in the centre to allocate to any particular period, but must pre-date the 1840s.

8. Cultural Heritage Management Issues

8.1

Of the sites found within Killearn Glen two are of little cultural heritage interest and, therefore, pose no immediate management issues. The oxbow lake (Site 3) and the area of collapse (Site 8) being naturally formed features are important, however, in terms of indicating how the natural heritage is continuing to shape and re-work the topography of the woodland. These processes do pose issues elsewhere in the Glen and need to be kept in mind going forward.

High Sensitivity

8.2

Four of the sites identified (No's 4, 5, 11 and 16) each have pressing management issues due to existing impacts. The rectangular structure (Site 4) was seen to be poorly preserved and slowly deteriorating due to the presence of large and small trees which have become established on and within elements of the structure as well as in its close vicinity. It is at added risk due to its proximity to the edge of the small ravine, which has clearly seen natural erosion during seasonal flooding within the woodland.

8.3

The possible bridging point (Site 5) observed near the north-western boundary of the woodland is currently quite well preserved but is at significant risk from seasonal flooding, as seen from the presence of collapsed masonry in the pool below. The presence of trees along the banks more generally is also causing collapse, as much of the banking is revetted by masonry similar to that at Site 5.

8.4

The dry stone wall (Site 11), circa 100 m to the south-west of Site 5, is quite poorly preserved and appears to be actively deteriorating, although slowly. It is at risk from tree root incursion, particularly at its northern end, as well as from seasonal flooding and occasional pedestrian traffic, the latter more during dry summer weather.

8.5

The section of burn immediately downstream of the Ladies' Linn waterfall is particularly threatened by the presence of large trees, many of which have already fallen over, pulling sections of banking with them. Although this is not a direct impact on any of the sites defined in this report, it is in very close proximity to Site 16, the terrace below the revetment wall. This small area of the woodland is particularly sensitive due to the inter-relationship of several key features; i.e. the revetment wall (Ha-Ha), the terrace and the designed watercourse. There are also short sections of drystone canalisation along this section of burn similar to those seen higher up the burn which are also directly threatened by seasonal flooding.

Medium Sensitivity

8.6

The mill pond/reservoir (Site 1) is thought to be in a reasonable state of preservation, and in a stable condition based on visual inspection. The current tree cover in this part of the Glen is relatively light, and the understorey of the woodland appears to provide some consolidation to the surviving elements of the structure. The biggest threat here is probably the presence of the footpath across the northern end of the feature, although this impact is quite limited.

8.7

The fairly extensive system of drainage (Site 6) seen across the northern area of the woodland is covered in reasonably dense woodland and understorey. There are many trees that appear to have self-seeded on the edge of ditches, particularly where there is a small bank and these are generally quite stable. However, in places some of these trees have attained considerable size and are at greater risk of falling or being blown over and that could damage the ditch system.

8.8

Site 7 is reasonably well preserved at present, but is slowly deteriorating. As a continuation of Site 6 it is, to some degree, at risk from the same pressures. However, due to the greater scale of the ditches that constitute Site 7 it is less threatened by tree root damage than the smaller ditches of Site 6. Instead, pedestrian erosion is a particular risk to this feature, as one of the principal paths within the woodland crosses these ditches and diverges in the bottom of the main channel. Seasonal flooding poses a secondary risk to Site 7 as it lies at the lower end of the extant drainage system.

8.9

The possible saw pit (Site 13) near the south-eastern boundary of the woodland is in reasonably good condition and is perhaps most threatened by a small tree growing 1 – 2 m to the west. In addition, the nature of the feature with its steep to vertical sides means that it is steadily collapsing in on itself, but given its current state this process should cease in the not too distant future.

8.10

The possible landscaped feature (Site 14) on the south-western edge of the woodland is currently in a reasonable state of preservation, but is slowly eroding as the steep ravine of the Kirkhouse Burn gradually collapses. In addition to this, the presence of trees growing out of the feature is potentially very damaging in the long term, but equally for the time being is likely to be providing a stabilising effect against the erosion on the side of the ravine.

8.11

The possible rig and furrow (Site 15) identified circa 55m south of Site 14, is also reasonably well preserved. Site 15 occupies a similar location to Site 14, between the open field and the edge of the ravine above the burn, and is under threat from essentially the same risks – i.e. proximity to the eroding edge of the ravine and the presence of tree roots.

Lower Sensitivity

8.12

The bank and ditch (Site 2) on the south-eastern side of the woodland is reasonably well preserved and currently in a stable condition. It is covered by trees and understorey shrubs that may, in the long term, cause

some damage, but for the time being don't appear to pose a threat. It is also crossed by principal footpaths at either end. The impact of the footpaths seems to have already caused some damage, but further damage has been arrested by the maintenance of the footpaths.

8.13

On the other side of the woodland, the ceramic field drain (Site 12) is currently fairly well preserved. Although it protrudes from the eroding bank is not considered to be at great risk as it is very likely to continue into the adjacent field.

8.14

At the northern end of the woodland, the midden/rubbish tip (Site 17) being on a relatively level area is at no risk of erosion and as it is shaped organically the trees and shrubs present are not likely to remove or damage any archaeological evidence.

9. Recommendations

Archaeological & Historical Research Recommendations

9.1

The primary focus of any future investigations in Killearn Glen should be led by the discovery of the previously unknown structure (Site 4) within the Glen. This structure is thought to be late Medieval and probably domestic in origin based on the cartographic and morphological evidence, and therefore raises a number of questions about the Medieval to post-Medieval transition within the area and how that relates to the history and use of the woodland in Killearn Glen, specifically:

- what and where was the precursor to the 1688 'Place of Killearn'?
- when was this built, and how did this develop?
- how did this function as a place of authority and how did it relate to the surrounding landscape?

9.2

In order to address these questions, it is recommended that several key sites within Killearn Glen should be targeted for further archaeological investigation and research:

- the rectangular structure (Site 4)
- the rig and furrow (Site 15)
- the terrace, 'tea house' and revetment wall complex.

9.3

Future research would ideally also consider the wider landscape, rather than just Killearn Glen as it is defined today. In order to understand the Medieval Killearn estate, a wider geographical area needs to be studied to fully answer the questions outlined above. This should include pursuing the archival research, briefly discussed in sections 3.5 – 3.6, to try to identify surviving estate records for the Late Medieval – Post Medieval period.

Historic Woodland Research Recommendations

9.4

A wider dendrochronological project could enhance our understanding of which species of trees were planted where and when. This would also help to provide a chronological framework for the evolution of the built heritage components of the archaeological landscape as well as for the biocultural heritage. In particular, it

would be informative to obtain some definite evidence for trees planted in the early days of the Place of Killearn, with its 'numerous plantations, regularly disposed in form of clumps, belts, and wildernesses' established to 'beautify and shelter an extensive tract of pleasure ground round the house'. This development did not occur in an empty landscape, instead it modified elements of the pre-improvement farming landscape some of which have become fossilised 'under' the woodland cover.

Archaeological Management Recommendations

9.5

A Woodland Management Plan (WMP) has already been prepared, on behalf of Stirling Council, by Iona Hyde (2016). The proposals outlined below are designed to complement or enhance those recommendations already put forward in the WMP.

9.6

The area of the Glen currently under greatest pressure from negative impacts is the corridor along the north-western boundary of the site defined by the stream channel of the northern tributary. Along its length there are several large trees that are rooted in the banking of the stream channel and are either damaging the canalisation of the burn or have already collapsed, and taken sections of the bank with them:

- it is proposed that these trees are felled and the stone work should be consolidated (see Hyde 2016, 57; WMP Compartments 1 & 5).

9.7

Adjacent to this stream is the terrace (Site 16) and the associated revetment wall (Ha-Ha) which are subject to similar pressures as the canalisation of the burn:

- it is proposed that any mature trees along the terrace or revetment wall are removed and the revetment wall be consolidated to prevent further collapse (see Hyde 2016, 58; WMP Compartment 5).

9.8

The rectangular structure (Site 4) is potentially one of the most significant archaeological features within the Glen (located in WMP Compartment 5). Further appropriate archaeological investigation is required in order to better understand the structure and allow a more detailed assessment of its conservation needs. Following such investigations, it may be appropriate to:

- carefully remove any mature trees from on or within the structure to prevent further damage;
- present the structure, with some appropriate interpretation, for example by leaving the wall lines exposed;
- establish an appropriate system to monitor the stability of the structure given its proximity to the edge of the ravine, that has potential for significant erosion.

9.9

The mill pond/reservoir (located in WMP Compartment 3) also has mature trees in close proximity to the edges and on/around the sluice end of the feature that are potentially damaging:

- these mature trees should be felled to prevent further damage;
- the footpath that crosses the northern end of the pond should be consolidated and formalised to prevent further erosion.

9.10

The Woodland Management Plan (Hyde 2016, p.55; WMP Compartment 1) recommends 'maintaining ditches to prevent siltation and inspect regularly'. This has potentially strong implications for the archaeological features identified by this project, specifically Sites 6 and 7. In light of that, it is proposed that:

- a detailed archaeological survey of the ditches be carried out before re-excavation or enhancement;
- any such 'maintenance' should seek to divert water away from Site 7, and into the extant stream system;
- the public paths that cross Site 7 should be formalised and consolidated to reduce erosion.

9.11

A number of features identified throughout the Glen that are of a medium sensitivity would benefit from further archaeological investigation to help inform current and future management needs. These include:

- the saw pit (Site 13), WMP Compartment 2;
- the landscaped feature (Site 14), WMP Compartment 4;
- the possible rig and furrow (Site 15), WMP Compartment 4.

9.12

The bank and ditch (Site 2), located across WMP Compartments 2 & 6, is considered to be low sensitivity, but is mentioned here to emphasise that it will need ongoing maintenance in order to prevent it from deteriorating further. This will include:

- removal of several mature trees along its length to prevent large wind-blown trees;
- maintenance of the two footpaths across it, to prevent chronic erosion.

9.13

Only as a point of clarity, it should be mentioned that, with regard to the recommendation in the WMP to 'replace the bridge' (Hyde 2016, 57; WMP Compartment 5), there is no evidence to suggest that a bridge existed downstream of the Ladies' Linn waterfall. Construction of such a bridge should therefore be seen in terms of continuing the heritage and cultural legacy of the designed landscape, rather than as a replacement or re-instatement.

Historic Woodland Management Recommendations

9.14

In the past this woodland has been mostly planted and more intensively managed than it is now. The character of the wood has changed and evolved over time, and there is no reason why it should not continue to be managed in the future. Some degree of reactive management is already ongoing, mainly to make the paths safe, with selective felling here and there. The WMP has a comprehensive scheme for future management, and by and large we would endorse its adoption. However, contra the WMP we would recommend the retention of some beech and sycamore for their wildlife value and because they are probably longstanding members of the old planted wood from which the cover today has evolved.

9.15

If the community support and funding could be found, it would be informative and engaging to manage this wood using traditional forestry methods, as would have been in use pre-mechanisation, when this woodland was established. One can imagine that felling by axe, and removal of logs by horse to a local saw-pit or saw-mill for conversion would be of great interest for the local community to witness or indeed take part in.

9.16

We would recommend re-coppicing some of the oak, perhaps first in a small experimental plot, or plots to assess the ability of the older stools to regenerate. Some of the younger planted oaks could also be coppiced and would be likely to do well. Any new coppicing would require deer-proof fencing around for the first few years.

9.17

The archaeological management recommendations include the removal of trees at a number of the sites. This would offer an opportunity to undertake targeted dendrochronological analysis of some of the trees on, or associated with the archaeological sites, not least to provide *terminus ante quem* dates for their construction and use. It would be straightforward to arrange for disk samples to be taken when any trees in meaningful locations are felled. For example, a large oak grows from one corner of the rectangular structure (Site 4), and the age of this tree would give a minimum timespan since the structure fell into ruin. More generally, the opportunity for a wider set of dendro-dates would augment the work already undertaken and help to provide a chronological framework for the landscape's evolution, both natural and cultural.

Acknowledgements

Northlight Heritage & Dendrochronicle are grateful to the local community volunteers for all their enthusiastic participation and for so generously providing additional information about the history of Killearn Glen. We are also grateful to Killearn Community Futures Company and Green Aspirations for involving us in this fascinating project and for all the assistance they have given us. We are grateful too to the Heritage Lottery Fund and other funding partners, and to Murray Cook and colleagues at Stirling Council for supporting this project.

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11. Appendices

APPENDIX 1: Tables / Concordances

Table 3: Archaeological Site Information

<i>Site No.</i>	<i>Easting</i>	<i>Northing</i>	<i>Marked on Map?</i>	<i>Previously Unknown?</i>	<i>Description of Feature/Structure</i>	<i>Current Impacts</i>	<i>Survival</i>	<i>Stability</i>	<i>Identified as (Site Type)</i>	<i>Estimated Date</i>
1	252164	685121	No	Yes	SW Facing. Deciduous Woodland, Bluebell & Bracken Undergrowth, Bog Plants in depression. Large boggy depression, surrounding sloping banks on all sides. Feeding stream from east, outflow continues east to join Kirkhouse Burn.	Trees, Footpath through top end	Good	Stable	Reservoir for Mill	Post-Medieval
2	252245	685179	No	Yes	Shallow slope parallel to side boundary wall. Perpendicular to side boundary of glen (Drumbegloan Side). Woodland/ Undergrowth Marsh Plants. Bank and ditch starting at side boundary wall extending c. 120 m in straight line to steep path to crossing of the burn just below group of Yew trees. Change in ground vegetation above and below line of ditch is marked - especially near the wall. Above denser birch and marsh plants, below Scots Pine/Oak less dense - grassy areas.	Boggy ground	Good	Stable	Bank & Ditch	Post-Medieval
3	252250	685282	No	Yes	Bank of main burn. Shallow west facing woodland. Flat section next to burn. There is a semi-circular depression across the flat area.	Flooding	Fair	Slow Deterioration	Natural Oxbow Lake	Unknown

Site No.	Easting	Northing	Marked on Map?	Previously Unknown?	Description of Feature/Structure	Current Impacts	Survival	Stability	Identified as (Site Type)	Estimated Date
4	252274	685335	No	Yes	Gentle slope above steep but shallow ravine. West facing. Spaced trees, bluebells and grass. Edge of steep, narrow ravine above small burn at SW end of natural re-entrant between two burns. Rectangular structure identified occupying the north western edge of narrow re-entrant between burns. The earth works appear to form a rectangular structure (c. 10 m x 5 m) with possible internal dividing wall and a small, rectangular annex abutting northeast end (c. 3 m x 3 m)	Tree roots, possible erosion on NW edge	Poor	Slow Deterioration	Rectangular Structure	Medieval / Post-Medieval
5	252244	685476	No	Yes	Gentle slope to NW & SE, steep sided cut of stream channel. SSW facing. Deciduous Woodland, Bluebell Bracken Undergrowth. NW edge of Killearn Glen, steep sided burn with dense Tree cover along edges. Laying approx. 80 m from northern entrance to the woodland, the burn is approx. 4 m wide - evidence of cutting into rock with 2 distinct corners that have drystone walling to build them up. Burn cascades down 1 m drop, into a pool, in 3 stages. Evidence of dressed stone blocks laying in pool.	Water Erosion	Good	Stable	Possible Bridging Point	Modern
6	252322	685415	No	Yes	Even, raised area between two northern tributary streams within the woodland. W facing. Deciduous Woodland, Bluebell & Bracken Undergrowth. Gently sloping	Bracken & woodland vegetation / Modern path	Fair	Stable	Water Drainage/ Woodland Management	Post-Medieval

Site No.	Easting	Northing	Marked on Map?	Previously Unknown?	Description of Feature/Structure	Current Impacts	Survival	Stability	Identified as (Site Type)	Estimated Date
					woodland. Channel with raised banks extending from the NE boundary of the woodland (housing estate) to the area of Ladies Linn, where it apparently feeds northwards into northern tributary burn. This larger channel runs parallel to tributary burn. Smaller channels feed in from northern side at upper end. No obvious side channels feeding into burn toward the south end.	erosion				
7	252227	685346	No	Yes	Undulating area where ground between two western tributaries narrows. W facing. Rough woodland/bracken. Southern edge of woodland clearing at narrowing of ground between upland tributaries. Allocated to complicated junction of various channels at narrowing of ground between the two northern tributary burns. The larger channel (Site 6) appears to split with a spur of the channel (c. 3 m wide) going roughly south and one going roughly west (c. 5 m wide) in to opposite tributary stream channels. The latter appears to show signs of a large land slip at the mouth of the channel, on the south side of that tributary stream. A few metres north of the divergence of these two channels, a narrow channel (c. 2 m wide) leads away from the	Footpath erosion, seasonal water flow, large tree root systems	Fair	Slow Deterioration	Water Drainage/Woodland Management	Post-Medieval

Site No.	Easting	Northing	Marked on Map?	Previously Unknown?	Description of Feature/Structure	Current Impacts	Survival	Stability	Identified as (Site Type)	Estimated Date
					original channel, to the west and drops steeply in to the stream. At the principal break of slope in this last channel, and at various points below it, several large blocks of dressed and undressed masonry can be seen partially buried and in no particular order.					
8	252334	685310	No	Yes	Northern bank of Kirkhouse Burn ravine. Dense woodland, with predominantly grass understorey. Steep sided, SE facing bank with semi-circular bowl/scoop in bank of Kirkhouse Burn ravine, c. 15 m across.	Seasonal water flow/tree root systems	Fair	Stable	Natural Erosion	n/a
9					(Void)					
10					(Void)					
11	252196	685374	Yes	No	Crosses burn flood plain. Shallow, S Facing. Overgrown by marsh plants, bracken and long grasses. Sits in base of burn flood plain opposite the confluence with small burn from west. Dry stone wall (predominantly sandstone), c. 1.5 m high toward southern end graduating to ground level at northern end of open, confluence area. Wall narrows slightly towards the top, which is finished with semi-circular sandstone coping stones. Wall c. 0.5 m wide at base. Rotted fence posts on west side of wall. The southern extent of the wall is where it meets the burn, but there are indications that it	Pedestrians, Tree Root Damage/Vegetation, seasonal flooding	Poor	Slow Deterioration	Dry Stone Wall	Post-Medieval

Site No.	Easting	Northing	Marked on Map?	Previously Unknown?	Description of Feature/Structure	Current Impacts	Survival	Stability	Identified as (Site Type)	Estimated Date
					continued further south on other side of burn. This could be the northern extension of the 'Ha-Ha'.					
12	252068	685181	No	Yes	Edge of plateau above deep river channel. Steep, S facing. Relatively sparse tree cover with shrubs. Open field to the west, above steep drop in to deep river/burn channel for Kirkhouse Burn. Two parallel, horse shoe shaped, ceramic field drains. Discharges in to open ditch which falls c. 7 m to the Kirkhouse Burn. Evidence of stonework along the ditch. Runs directly under tree on the boundary of wood and field.	Tree roots.	Good	Stable	Field Drain	Post-Medieval/Modern
13	252362	685258	No	Yes	Feature sits in relatively flat, open area on SE side of woodland. SW Facing, gradual slope. Sparse, mixed woodland with ferns, bracken and brambles. Open woodland, on SE edge of deep burn channel. 3 m by 2.5 m rectangular sunken dug out, c. 0.7 - 0.8 m deep. Sharp breaks of slope above vertical sides. No indications of any 'structure' i.e. wood or metal. An L-shaped, sunken entrance(?) c. 0.7 m wide and 3 m long was identified meeting its southern corner.	Collapse/Erosion, tree roots.	Good	Slow Deterioration	Possible Saw Pit	Modern
14	252112	685259	No	Yes	Top of steep bank to river, almost flat land behind. SE facing, on edge of woodland. Distinct elongated mound extending from		Good	Slow Deterioration	Landscaped escarpment?	Unknown

Site No.	Easting	Northing	Marked on Map?	Previously Unknown?	Description of Feature/Structure	Current Impacts	Survival	Stability	Identified as (Site Type)	Estimated Date
					field level to edge of river channel, c. 8 m above river. Ditch on south side is c. 2 m wide, 0.5 m deep. Large, old multi-stem lime tree at top. This is end of a line of similar trees running across open field on west side. North side of mound has less steep descent to river with a ledge (path?) about 1 m wide running down to c. 2 m above river. Several courses of stonework visible in river bank at end of this.					
15	252091	685206	No	Yes	Level area with slight slope to SE, towards the Kirkhouse Burn. Slopes gently W-E. Trees, bluebell etc. understorey. Woodland backing on to field area. Three shallow, parallel ditches with banks between. Ditches spaced approximately 11 m apart. Higher ground around 0.5 m higher the base of the ditches. Sudden drop off to burn at Eastern edge. Possible extension of southern bank in to open field planted with (lime?) trees.	Tree and shrub roots	Fair	Slow Deterioration	Possible Rig & Furrow	Medieval / Post-Medieval
16	252132	685317	Yes	No	Sits below 'Ha-Ha' and above tributary of Kirkhouse Burn. Feature forms level area in a steep, SE facing slope. Rough grass and sycamore seedlings. Revetment wall with inset building, parallel with terrace over Ladies Linn. The terrace is defined by the 'Ha-Ha' to the NW and the bank of the burn	Collapse/Erosion of revetment wall and river bank, and presence of Tree roots.	Fair	Slow-Deterioration	Terrace over Ladies Linn	Post-medieval

<i>Site No.</i>	<i>Easting</i>	<i>Northing</i>	<i>Marked on Map?</i>	<i>Previously Unknown?</i>	<i>Description of Feature/Structure</i>	<i>Current Impacts</i>	<i>Survival</i>	<i>Stability</i>	<i>Identified as (Site Type)</i>	<i>Estimated Date</i>
					to the SE. It is approximately 12.5 m wide between revetment wall and Ladies Linn, but narrows slightly to the SW.					
17	252453	685382	No	Yes	Clearing in woodland. Gently sloping to the west. Predominantly trees with bluebell understorey, with shrubs, ferns, bracken and brambles. Relatively level area near northern edge of woodland. Mound c. 11-12 m in diameter - the edge is most distinct at NW and W edges. Rest of edges indistinct and merge into woodland floor. Variety of glass and ceramic bottles identified across top of mound, all late 19th/early 20th century in date.	Nothing apparent	Good	Stable	Midden/Refuse Tip	Post-Medieval/Modern

Table 4: Woodland Assessment: Tree Record Information

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
3217	KT001	Alder	Double stem – forked	1.17	372	NS 52453 85390	
3218	KT002	Oak	Maiden, sessile oak	3.87	373	NS 52456 85393	
	KT003	Birch	3 fused stems, downy birch	1.26	374	NS 52446 85383	
	KT004	Birch	Maiden	1.28	375	NS 52435 85373	
	KT005a	Veteran birch (with Gean)	Maiden, downy birch	2.84	376	NS 52430 85373	
	KT005b	Gean (with Veteran	Maiden, gean=wild cherry	0.77	376	NS 52430 85373	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
		birch)					
	KT006	Oak	Maiden, young	0.48	377	NS 52427 85364	
	KT007	Oak	Maiden, young	0.44	378	NS 52425 85365	
	KT008	Rowan	Multi-stem, had to girth all 4 together	1.15	379	NS 52409 85353	
	KT009a	Rowan (with Birch)	Multi-stem, largest stem girthed.	0.95	380	NS 52406 85355	
	KT009b	Birch (with Rowan)	Multi-stem, pendulous birch	0.79	380	NS 52406 85355	See above

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT010	Birch	Maiden, growing from ?larch stump	0.88	381	NS 52402 85351	
	KT011	Rowan (with dead birch)	Maiden, phoenix rowan fallen with broken birch	0.23	382	NS 52403 85339	
	KT012	Birch (with felled Rowan)	Both maidens, grow from ?larch stump	0.83	383	NS 52396 85344	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT013a	Rowan (with birch)	Maiden rowan, grows from ?larch stump	0.44	384	NS 52394 85339	
	KT013b	Birch (with Rowan)	Multi stem birch, grows from ?larch stump	0.60	384	NS 52394 85339	See above
	KT014	Rowan	Maiden, grows from ?larch stump	0.60		<i>Between WM384&385</i>	
	KT015	Rowan	Maiden, probably all these rowan self-seeded	0.62	385	NS 52383 85330	
	KT016	Rowan	Maiden, nr stand of European larch	0.60	386	NS 52382 85324	
	KT017	Oak	Maiden, sessile oak	2.59	387	NS 52369 85316	
	KT018	Sycamore	Maiden	2.15	388	NS 52340 85319	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT019	Oak	Coppiced oak, multi-stem, largest girthed	1.29	389	NS 52349 85277	
	KT020	Oak (dead)	Maiden, standing dead	2.20	390	NS 52341 85269	
	KT020	Repeat waymark at KT020			391	NS 52343 85270	
	KT021	Birch	Multi-stem pendulous birch, 1 large (girthed) & 2 small stems	1.74	392	NS 52348 85258	
	KT022	Oak	Coppice, multi-stem, 7 stems, largest girthed	1.46	393	NS 52290 85235	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT023	Oak	Coppice, multi-stem, 3 stems, largest girthed	1.41	394	NS 52293 85229	
	KT024	Oak	Coppice, 2 stems - 1 large (girthed) 1 small fused	2.26	395	NS 52289 85218	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT025	Oak	Coppice, multi-stem, 1 dominant (girthed) & 1 small dead	1.81	396	NS 52276 85206	
	KT026	Oak	Coppice, multi-stem 3 large (largest girthed) & 2 small. Stool of 3m diameter	1.82	397	NS 52273 85209	
	KT027	Birch (pendulous)	Multi-stem, 2 stems measured together	2.55	398	NS 52259 85177	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT028	Birch (& fallen oak)	Birch with fallen phoenix oak growing out of birch stump	not taken	399	NS 52246 85183	
	KT029	Scots pine	Maiden (just S ie downhill of 'my' bank)	1.87	400	NS 52236 85159	
	KT030	Scots pine	Maiden (just S ie downhill of 'my' bank)	1.73	401	NS 52235 85159	See above
	KT031	Oak	Probably fused coppice, ie fused multi-stem	2.51	402	NS 52216 85144	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT032	Birch	Fused multi-stem (3 stems fused)	1.48	403	NS 52210 85139	
	KT033	Oak	Coppice, multi-stem, 2 main & 2 small dead sawn off	1.63	404	NS 52186 85125	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT034	Oak	Coppice, multi-stem partially fused, girth taken low down around fused stems	3.43	405	NS 52176 85116	
	KT035	Oak	Coppice, multi-stem, girth taken low down around fused stems	4.37	406	NS 52151 85102	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT036	Alder	Double stem, largest girthed, on edge of burn,	1.06	407	NS 52142 85088	
	KT037	Oak (with holly)	Maiden, with holly around the base	3.05	408	NS 52130 85089	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KT038	Oak (with holly)	Multi-stem, 1 dominant one smaller stem, girthed 2 stems together	2.37	409	NS 52121 85080	
	KT039	Holly	Multi-stem, 7 stems, girthed together, approx girth	4.00	410	NS 52102 85057	
	KT040	Beech	Single stem (says PQ), fluted, massive, dead	4.50	411	NS 52066 85036	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KLG01	Scots Pine - cored	Single stem, very tall straight	2.50	412	NS 52329 85286	
	KLG02	Oak coppice - cored	Coppice, multi-stem, largest girthed, stool about 2m diameter, 'inside' 'my' bank and beside Murray's 'hollow way'	1.47	413	NS 52293 85228	

Existing No.	Tree Feature No	Species	Form & other info	Girth (m)	Way-mark	NGR	Photo
	KLG03	Yew - cored	Maiden, near Ladies Linn	2.47	414	NS 52195 85324	

Table 5: Digital Photographs

<i>Photo No.</i>	<i>Camera Model</i>	<i>Site No.</i>	<i>Description</i>	<i>From (Compass)</i>
001	NIKON D3100	6	South eastern stretch of drainage system	SW
002	NIKON D3100	6	South eastern stretch of drainage system	S
003	NIKON D3100	6	South eastern stretch of drainage system	E
004	NIKON D3100	6	Mid-section of Drainage system	SW
005	NIKON D3100	6	Mid-section of Drainage system	SW
006	NIKON D3100	6	Upper section (sample) of drainage system	SE
007	NIKON D3100	6	Upper section (sample) of drainage system	SE
008	NIKON D3100	6	Upper section (sample) of drainage system, showing trees on edges of ditch.	SE
009	NIKON D3100	6	Upper section (sample) of drainage system, showing trees on edges of ditch.	SE
010	NIKON D3100	7	Lower section of drainage system	SW
011	NIKON D3100	7	Lower section of drainage system	SE
012	NIKON D3100	7	Lower section of drainage system	S
013	NIKON D3100	7	Lower section of drainage system	N
014	NIKON D3100	7	Lower section of drainage system, showing sluice channel	NW
015	NIKON D3100	7	Lower section of drainage system, showing sluice channel and landslip	S
016	NIKON D3100	11	Dry stone wall at north-west limit of site	S
017	NIKON D3100	11	Close up of dry stone wall, site 11	E
018	NIKON D3100	11	Dry stone wall at north-west limit of site	N
019	NIKON D3100	11	Dry stone wall at north-west limit of site	SW
020	NIKON D3100	5	Canalisation of burn adjacent to Site 5	SW
021	NIKON D3100	5	Canalisation of burn adjacent to Site 6	NE
022	NIKON D3100	5	Close up of dry stone revetting adjacent to Site 5	N
023	NIKON D3100	13	G Sims stood in saw pit (Site 13)	S
024	NIKON D3100	13	Saw pit (Site 13)	SE
025	NIKON D3100	1	Mill reservoir	NE
026	NIKON D3100	1	Mill reservoir	NE
027	NIKON D3100	1	Mill reservoir	E
028	NIKON D3100	1	Mill reservoir	NE
029	NIKON D3100	1	Mill reservoir, close up of sluice area	NE
030	NIKON D3100	1	Mill reservoir	S
031	NIKON D3100	2	South eastern end of Bank & Ditch	NW
032	NIKON D3100	2	South eastern end of Bank & Ditch	NW
033	NIKON D3100	2	North western end of Bank & Ditch	SE
034	NIKON D3100	2	North western end of Bank & Ditch	NW
035	NIKON D3100	~	Drainage ditches near Site 13	NW
036	NIKON D3100	~	Drainage ditches near Site 13	NW
037	NIKON D3100	~	Working Shot: Drainage ditches near Site 13	NW
038	NIKON D3100	~	Working Shot: Drainage ditches near Site 2	SW
039	NIKON D3100	~	Drainage ditches near Site 2	SW
040	NIKON D3100	~	Drainage ditches near Site 2	SW
041	NIKON D3100	~	Drainage ditches near Site 2	SW
042	NIKON D3100	~	Drainage ditches near Site 2	?
043	NIKON D3100	~	Drainage ditches near Site 2	S
044	NIKON D3100	~	Drainage ditches near Site 2	NE
045	NIKON D3100	~	Drainage ditches near Site 2	SW
046	NIKON D3100	~	Drainage ditches near Site 2	E

Table 6: Other Digital Photographs (by set)

<i>Set No.</i>	<i>Photographer</i>	<i>Date</i>	<i>Description</i>	<i>No. of Images</i>
001	Peter Smith	23/04/16 & 24/04/14	Site Photographs & Working Shots	79
002	Peta Glew	10/04/16	Working Shots – Training Day	6
003	Duncan Clark	10/04/16	Site Photographs, Scenic & Working Shots	183
004	Duncan Clark	23/04/16	Site Photographs, Scenic & Working Shots	390
005	Jo Edwards	08/05/16	Team Photos	2
006	Norman McNab	08/05/16	Dendro-coring work	7

APPENDIX 2: Observations by Peter Quelch of visit on 23rd April 2016

The day was arranged around carrying out a transect across the wood from the village edge to the southwest corner. Local volunteers rotated in groups of three between tree studies and archaeological exploration.

The first remarkable trees were at the start of the transect, beside a small stream issuing from below the boundary fence. Enormous mature oak with wide spreading crowns, from a previous generation of perhaps parkland trees, more or less one each side of a wide open ride to the west, beside the minor burn. Lower down that burn on wet soils were extensive alders in an alder-carr woodland.

The rest of the woodland had a large variety of types and ages of trees, including roughly 30 year old oaks, carefully planted and spaced, with occasional gean perhaps from the same planting episode. It was nice to see good oaks carefully tended, compared to the often ill shaped young oaks coming from planting in plastic guards and tubes. There is a cohort of middle aged oaks now widely spaced across the site, many of tall straight stems, which would be valuable in a commercial woodland.

The large numbers of conifers pointed to a previous nurse crop grown with those oaks to bring them up straight and fast, mainly of European larch, with plenty of examples of Norway spruce and Scots pine to indicate a mix of those species had been used as nurses, and then mainly removed for utilisation. Whole groups of larch had survived giving a nice landscaping effect. Close to them were also numbers of larch stumps, many with rowans growing out of them, probably arising after windthrow of the larch in the past.

We spent some time looking at the two species of birch, their differences and the fine examples of both downy birch and pendulous birch to be found in the wood. We talked about possible markets for birch in the past, and I said that it used to be in strong demand for making bobbins for the cotton industry. Later I found that neighbouring Balfron had a big cotton mill built in 1790, and there would probably have been several bobbin or 'pinn' mills around the district to supply that mill. Maybe the mill just downstream of this woodland would have been one of those – only documentary research can prove that I suspect.

Our group also saw many other tree species growing in Killearn wood, for example wych elm and ash in the burn-sides, bird cherry, elder and hazel as bushes. Sycamore was found in both large stools arising from previous felling of large sycamores, and smaller trees presumably arising as seedlings from older sycamore. Beech were also numerous for the same reasons. However, it must be said that this is a historic woodland rather than an ancient natural woodland and both these species were a normal part of woodland planting schemes in the 18th and 19th centuries. Indeed, at the south west corner were two huge beeches remaining from some of the earliest planting. Other notable planted trees along the straight SE boundary included old rowans, almost rotted away but hanging on, and one very large ash stool, while just outside the woodland near the south west corner was a nice maiden ash, probably planted as part of improvements on an old field edge.

I won't go into the sequence of old maps, as others in the team are already working on these in connection with the archaeology of the old Killearn house and its associated parkland just to the west of this woodland.

So far most of what I have described have been features of planting on flattish land that must have been old fields previously. Indeed, at one point close to the south east boundary we saw what we thought were wide rig under the planted trees coming at an angle from across the dyke (more or less east-west) which then stopped abruptly at an old field edge dyke, still very visible within the woodland. These tie in with Roy's map of approx 1750 which shows only a narrow belt of woodland south of the burn and arable fields south east of the wood. *(CMM notes that Northlight Heritage staff consider these possible rig features to be drains rather than rig, and also notes that the undergrowth is now too dense and tall as of June 2016 to check this out further at this stage.*

Something to pursue further in the winter months).

So the most notable feature for me was surely the area of old oak coppice stools both sides of the Kirkhouse burn and over quite a lot of the woodland in the south west area. It would be a good step forward to map these stools carefully, as there was a distinct edge to their extent, at one point coinciding with what seemed to be an old hollow-way (*CM note; this equates to Compartment 3 in the WMP, Hyde 2016*). If any trees represent remnant ancient semi-natural woods from before the improvement era it must be these, and the woodland strip shown on Roy seems to equate with this area of old oak coppice, most other planting being more recent.

However perhaps the oaks that now seem to be ancient or natural were also planted in earlier landscapes created on this site? Only further history and archaeology studies can help uncover the truth, but Killearn woodland makes a fascinating ongoing study for the local community group.

APPENDIX 3: Extracts from the Old and New Statistical Accounts of Scotland

First Statistical Account for Parish of Killearn (1791-99 Vol 16)

Gentlemen's Seats, etc.

"About a mile and a half south of the village is the Place of Killearn, anciently the seat of a cadet of the Montrose family, but lately of Robert Scott of Killearn, Esq; and now the property of the Right Hon. James Montgomery, Lord Chief Baron for Scotland. The present edifice, which is far from being large, was built in the year 1688. Numerous plantations, regularly disposed in form of clumps, belts, and wildernesses, beautify and shelter an extensive tract of pleasure ground round the house" p.102

Plants, Trees etc.

"Great varieties of indigenous plants ornament the numerous glens, rocks, and muirs. The Juniper grows in some places to a great size, and is commonly very prolific." p.110

"The *Sambucus nigra* (elder tree, England) is no stranger in many places of the parish. Some of the trees are very well shaped, and by the natural bending of the branches cause an agreeable shade, or bower, exhibiting an example of the propriety of the name given to that species of plants in Scotland, namely, the Bower-tree. A great number of beautiful oaks ornament the estate of Ballikinrain. The largest, and probably the oldest in the parish, grows in full vigour at Killearn Place. The trunk is 12 feet circumference, and supports many stately branches that widely display a foliage uncommonly pleasant. No production of the vegetable kingdom in this parish is, however, more remarkable than two large yew trees at Ballikinrain." p.110-111

"This part of the country is far from being destitute of exotic plants in a high degree of perfection. This is particularly the case with respect to the *larix*, a great number of which adorn the banks and inclosures at the house of Killearn. They are about 60 years old, being amongst the first of the kind that were planted in the open field in Scotland; they are generally 3 feet in diameter at the thickest and have grown to the tallest of nearly 100 feet. For beauty and size very few, if any of the kind in Scotland surpass them. In the vicinity of the *larixes* are many beautiful spruce and beech trees, of uncommonly large dimensions. The oriental maple, the sweet chestnut and tulip trees have, in this place, arrived to great perfection and beauty." p.111-112

"Extremely few of the lately improved instruments of husbandry have been brought into practice. The common Scotch plough, wrought with four horses, is in general use. The farmer, before agriculture can be brought to any tolerable degree of perfection, must direct his care to free his land from under water, which almost universally prevails. But the practice of draining, although very much needed, meets here with small attention." p.114

Second Statistical Account for Parish of Killearn, 1841

Hydrography

"At the southern extremity of the parish, where it meets Kilpatrick, there is an artificial lake, covering about 150 acres, a reservoir to supply water during summer to the Partick mills, on the Kelvin near Glasgow, as the sources of that river were taken to form the summit reservoir of the Forth and Clyde Canal. Besides the Enrick and Blane, already alluded to, there are many rivulets descending rapidly from the mountain's brow, and forming numberless cascades in their course. Of these, the finest is in the glen of Dault, near Killearn House, where in a deep wooded ravine, amid many smaller falls, the rivulet rushes over a perpendicular precipice of sixty feet. In the same neighbourhood, the Carnock, another rivulet, has worn a channel seventy feet deep, through red sandstone. (Most names of places are Celtic, and significant. The chasm of Carnock is called Ashdow, a corruption of Uisk-dhu, black water, from the dark appearance of the rivulet, as the rays of the sun rarely reach it, on account of the high precipices and overhanging woods. Carnock is a diminutive of Carron, and signified

little winding river. Dualt flows through mossy ground; hence its origin dhu-alt, black rivulet. Avon or Ann is the same in sense and sound with the Latin Amn is.) There are also many cascades on the rivulets of Ballikinrain and Boquhan, the steep banks of which have been planted by the proprietors; and numerous walks have been made along them, that the scenery may be seen to advantage." p.61-62.

Trees

"The arable part of the parish is generally well wooded as regards both shelter and ornament. Besides the plantations which surround the houses of proprietors, every glen and ravine is covered with copse wood. The following table contains the dimensions of some remarkable trees, as measured at present, and as reported in the former Statistical Account. The yew trees are near the House of Ballikinrain; the others are on the estate of Killearn, near the old mansion house.

Trees	Girth 1794	Girth 1834	Cubic contents
Yew, berry-bearing	8 feet 0 inches	8 feet 5 inches	89 feet
Yew, barren *	10 feet 8 inches	10 feet 3 inches	103 feet
Oak	12 feet 0 inches	13 feet 3 inches	300 feet
Silver fir	Not reported	12 feet 1/2 inches	302 feet

(* The former reported must have measured this tree, and perhaps the others, where thickest, as his measurement is greater than the present at three feet above the surface. At six feet, near the branches, the girth is eleven feet.)"

"These trees are all in vigorous growth, yet the increase during forty years is inconsiderable. There is a possible error in the comparison. The former reporter does not state the height where he measured the circumference. I made all the measurements at three feet above the ground. From many observations on yew trees, Dr Candolla of Geneva calculates their average annual increase in diameter at one-twelfth of an inch, which is more than double of what is shown in this table; and by that rule the age of one yew is 404 years, and the other, 492. If we assume that the increase of the oak, as in the table, is 15 inches in circumference, or 5 in diameter, during a period of forty years; then, on the supposition that its growth has been equable, the age of the tree is 424 years. The age of the silver fir is known to be about 100 years, while it nearly equals the oak, however old it may be, in circumference, and, from its greater height, exceeds it in cubic contents." p.63-64.

Land-owners.

"The greater part of the parish belonged, at an early period, to the family of Montrose, who still retain the superiority, though they have alienated all the property but one farm. Originally, the patron of a church was proprietor of the parish annexed to it. In 1429, six churches, Cambuslang, Tarbolton, Eaglesham, Luss, Kirkmahoe, and Killearn, were, with consent of the patrons, erected into prebends of the cathedral of Glasgow. (Chartulary of Glasgow, quoted in Connel on Tythes, Volume iii. Appendix, Number 13.) Vicars were appointed afterwards to these parishes; and, as an illustration of their comparative opulence, the stipend assigned to Killearn was fifteen merks, while that of the others was twenty. (The following table shows the rent of Luss and Killearn at later times: Luss, Valued rent 1656, £1,500 Scots. Real rept 1841, £7,000 Killearn, Valued rent 1656, £2,840 Scots. Real rept 1841, £6,900.)"

"In that erection, Patrick Lord de Graham is mentioned as patron of Killearn. In 1560, William, second Earl of Montrose, gave to his youngest son, by a charter of that date, the lands of Killearn, Ibert, and Drumbeg. (Douglas' Peerage - Article Montrose. These names continue still unchanged. Ibert, according to Dr Macleod of St Columba's, Glasgow, signifies the Well of Sacrifice, equivalent to Holywell in Ireland. Drumbeg is Celtic for little ridge.) A descendant of that family represented the county in the British Parliament, during the earlier part of last century. When he entered England, he could not fail to observe the nakedness of his native land. He was the first in this district who attempted, by plantations, to improve the climate, and to adorn the country.

Besides the usual forest trees, of which there are many beautiful specimens at Killearn, he was among the first that introduced the larch into Scotland. From want of timely thinning, the larch trees have not thriven, as they are remarkable only for extreme height; many of them being 100, and one 114 feet high. In the former Statistical Account, they are said, when sixty years old, to be three feet in diameter; now when they are upwards of 100 years, I could find only one that was 3 9/12 feet, at the height of three feet from the ground. In 1750, the estate was sold to Mr Scott of Glasgow, whose only daughter was married to Sir James Montgomery, Bart., Chief Baron of the Exchequer. That excellent man here, as well as in his native county of Peebles, patronized rural improvement, by feuing ground for the village, by enclosing his whole estate with hedges, and by giving leases generally of fifty seven years, to enable his tenants to reap the benefit of their outlay on their farms. The result of these leases does not seem encouraging either to tenant or landlord." p.64-65.

Plantation and Pasture.

"There is little natural wood in the parish. The extent under plantation, is about 1,140 acres. The object of proprietors is to convert these plantation into copse, filling them entirely with oak, and cutting them, every twenty years: yet, as oak bark has fallen to about £8 per ton - less than half of the war prices, and as there is a growing demand for fir, especially larch, it is probable that the latter will be more extensively planted. The annual value of wood sold, is about £400. It may increase considerably beyond that sum, as a great part of the oak copse is not arrived at perfection."

"The ground that is waste, or in permanent pasture, extends to 8,860 acres, and admits of some improvement by draining marshes, and by sheltering exposed ground by artificial plantations - even though not partially brought into cultivation." p.68

APPENDIX 4: National Records of Scotland Search Results

Search Criteria: 'Killearn'; dates between '1650' & '1900'.

This returned 169 results, one of which was disregarded as it specifically referred to Aberdeen.

These results were rapidly graded based on the title and how likely it might be to yield information on the Place of Killearn and / or its estate. Sixty-four results seemed of no relevance, fifteen showed indications of being of some relevance (Low), thirty-one of relevance (Medium) and fifty-eight of significant relevance (High). The latter fifty-eight are summarised below.

Table 7: Summary of National Records of Scotland Search.

Level of Significance	Date	Reference	Title
High	1713	CS232/B/2/32	Anna Butler v Lord and Lady Killairn [Killearn]
High	1713	GD220/5/317	Correspondence of James, 1st Duke of Montrose: Montrose to John Graham, younger, of Killearn. Glasgow
High	1715	CS232/H/2/20	Hamilton of Bardowie v Grame [Graham] of Killearn
High	1733	CS181/1977	Archibald Edmonston, of Duntreath, and others, heritors of Parish of Killearn vs Graham: Unstated
High	1757	CS234/K/2/11	Killern [Killearn]: Minutes of Ranking
High	1823	CS232/B/27/1	Blackburn and others v Graham and others: Suspension and interdict
High	1878	ED2/9/61	Stirling: Killearn to Strathblane
High	[c 1727]	GD220/1/J/4/5/4	Instrument of sasine following on precept contained in the heritable bond by John Graham of Killearn obliging him and his heirs to pay James, Duke of Montrose, his male heirs and successors in the estate of Montrose, £16 scots yearly at two terms in the year from Martinmas 1727 for as long as John Graham or his male heirs possess the lands of Killearn, Ibert, Treinbeg and Miln of Killearn (see GD220/1/J/4/5/3).
High	1 Feb 1712	GD220/1/H/7/5/3	Contract between James, Duke of Montrose and John Graham, younger of Killearn whereby the Duke disposes to John Graham, his heirs and assignees the whole teind sheaves of his lands of Killearn, Ibert, Treinbeg and mill of Killearn for yearly payment by John Graham of 100 merks as stipend to the minister of Killearn and relieving the Duke of all augmentations or public burdens that might be imposed on the said teinds. Contains precept of sasine.
High	1 Jan - 30 May 1723	GD220/5/1000	Letters to Mungo Graham of Gorthie: John Graham younger of Killearn. London
High	10-15 May 1710	GD220/5/241	Correspondence of James, 1st Duke of Montrose: John Graham, younger, of Killearn. Drymen, Killearn
High	11 Apr 1716	GD220/5/973	Letters to Mungo Graham of Gorthie: John Graham, younger, of Killearn. Killearn
High	11 Jan-24 Dec 1724	GD220/5/1009	Letters to Mungo Graham of Gorthie: John Graham younger of Killearn. London
High	12 Jan 1706	GD220/5/947	Letters to Mungo Graham of Gorthie: John

Level of Significance	Date	Reference	Title
			Grahame younger of Killearn. Glasgow
High	14 Jan-28 Dec 1727	GD220/5/1054	Letters to Mungo Graham of Gorthie: John Graham of Killearn. London, Killearn, etc,
High	15 May 1710	GD220/5/767	John Graham of Killearn to Captain Thomas Graham. Killearn
High	16 Feb-10 Dec 1736	GD220/5/1372	Letters to Mungo Graham of Gorthie: Graham of Killearn
High	1693-1717	GD1/850/70	Miscellaneous receipts for teinds in Killearn parish (enclosed in a home-made parchment poke, made out of a discarded 17th cent charter)
High	1717-1719	E636/6	Forfeited Estates: Inversnaid [alias Craighroyston]: Estate Management: Accounts, charge and discharge, John Graham, younger, of Killearn, factor, crops 1717-19
High	1758-1767	GD220/6/622	Papers relating to vacant stipend of parish of Killearn
High	1765-1766	GD220/6/174	Writs of lands of Killearn in parish of Killearn, and others
High	1788-1807	GD461/145	Correspondence to William Finlay of Moss, writer, Killearn, sometime factor over the estate of Killearn, concerning both family news and affairs and estate business. (19 items)
High	18 Apr-28 Jul 1715	GD220/5/556	Correspondence of James, 1st Duke of Montrose: John Graham, younger, of Killearn. Killearn, Buchanan, Stirling
High	1800-1804	GD461/148	Copy correspondence from Mr Charles MacNab, tenant of Killearn House from James Montgomery, Whim, with reference to William Finlay, writer, Killearn. (3 items)
High	1801-1807	GD293/2/29	Killearn Rent Rolls
High	1810-1813	GD293/2/59	Rental Accounts of the lands of Killearn
High	1833-1839	GD314/855	Business correspondence between James Gillespie Graham and Mrs Blackburn, and financial accounts for James Gillespie Graham that refer to architectural plans for a house at Killearn and Heriot's Hospital, Edinburgh.
High	1852-1930	HR201	Records of heritors of Killearn Parish
High	19-23 Jul 1717	GD220/5/976	Letters to Mungo Graham of Gorthie: John Graham younger of Killearn. Buchanan, Inversnaid
High	2 Jan-26 Dec 1729	GD220/5/1103	Letters to Mungo Graham of Gorthie: John Graham of Killern
High	2 Mar 1712	GD220/5/276	Correspondence of James, 1st Duke of Montrose: John Graham, younger, of Killearn. Killearn
High	2 Oct-5 Nov 1705	GD220/5/946	Letters to Mungo Graham of Gorthie: John Graham younger of Killearn and Andrew Clow
High	21 Feb-23 Dec 1732	GD220/5/1223	Letters to Mungo Graham of Gorthie: Graham of Killearn
High	21 Jan-11 Dec 1725	GD220/5/1020	Letters to Mungo Graham of Gorthie: John Graham. Glasgow
High	22 Sep-23 Dec 1707	GD220/5/138	Correspondence of James, 1st Duke of Montrose: John Graeme of Killearn. Edinburgh, Killearn

Level of Significance	Date	Reference	Title
High	23 Oct 1727	GD220/1/J/4/5/2	Bond of tailzie by John Graham of Killearn to James, Duke of Montrose containing procuratory of resignation for resigning the superiority of the lands of Killearn, Ibert, Treinbeg and miln of Killearn, multures and sequels of the same in the King's hands, in favour of the said John Graham and his male heirs, whom failing to the Duke of Montrose or his male heirs of tailzie, with the provision that it shall not be lawful for John Graham or his heirs to alter the substitution in favour of the Duke and his heirs, nor to grant any rights of the superiority of the said lands, nor to contract any debt which might culminate in the eviction to the prejudice of the substitution, declaring all such deeds null and void and the granter of any such to forfeit the superiority of the said lands which will revert to the Duke. Registered in the Register of Tailzies, 19 Jul 1728.
High	23 Oct 1727	GD220/1/J/4/5/3	Heritable bond by John Graham of Killearn obliging him and his heirs to pay James, Duke of Montrose, his male heirs and successors in the estate of Montrose, £16 scots yearly at two terms in the year from Martinmas 1727 for as long as John Graham or his male heirs possess the lands of Killearn, Ibert, Treinbeg and Miln of Killearn, and also obliging the successors to John Graham to make payment to the Duke of Montrose of £200 on the decease of John Graham and on the decease of each heir. Containing precept of sasine.
High	23 Oct-20 Dec 1722	GD220/5/998	Letters to Mungo Graham of Gorthie: John Graham, younger, of Killearn. London
High	24 Dec 1709	GD220/5/220	Correspondence of James, 1st Duke of Montrose: John Graham, younger, of Killearn. Edinburgh, 24 Dec.
High	25 Nov 1727	GD220/1/J/4/5/1	Procuratory of resignation by John Graham of Killearn in favour of himself and his male heirs, whom failing to return to James, Duke of Montrose and his heirs in the estate of Montrose, of the superiority of the lands of Ibert, Treinbeg and Miln of Killearn.
High	27 Apr 1703	GD220/5/55	Correspondence of James, 1st Duke of Montrose: John Graeme of Killearn. Killearn
High	27 Sep 1715	GD220/5/786	Copy letter, Earl of Mar to John Graeme of Killearn. From the camp at Dunkell
High	27 Sep 1715	GD220/5/787	Copy letter, 5th Earl of Linlithgow to John Graeme of Killearn. Dunkeld
High	27 Sep-5 Dec 1714	GD220/5/375	Correspondence of James, 1st Duke of Montrose: John Graham, younger, of Killearn. Stirling, Killearn
High	29 Mar-16 Jun 1708	GD220/5/166	Correspondence of James, 1st Duke of Montrose: John Graeme of Killearn. Killearn
High	3 Feb 1735	GD220/5/1334	Letters to Mungo Graham of Gorthie: James Graeme, Killearn's brother. Glasgow
High	30 Aug 1701	GD220/5/10	Correspondence of James, 1st Duke of Montrose: William Cochrane of Kilmarnock and John Graeme of Killearn. Mugdock

Level of Significance	Date	Reference	Title
High	31 Jan-24 Dec 1735	GD220/5/1333	Letters to Mungo Graham of Gorthie: Killearn.
High	5 Feb 1713	GD220/5/966	Letters to Mungo Graham of Gorthie: Gorthie to John Grahame younger of Killearn. Glasgow
High	5 Jan-28 Dec 1726	GD220/5/1028	Letters to Mungo Graham of Gorthie: John Graham. Glasgow, etc
High	5 Jan-28 Nov 1725	GD220/5/1018	Letters to Mungo Graham of Gorthie: John Graham younger of Killearn. London
High	6 Aug 1711	GD220/1/H/7/5/4	Charter of resignation containing a novodamus by James, Duke of Montrose in favour of John Graham of Killearn of the lands of Killearn to be held feu of the Duke for payment of 24 merks yearly (the whole feu duty formerly paid for the said lands) and the lands of Ibert and Treinbeg and the mill of Killearn, and acceptance of this charter shall bind John Graham to pay the burden of the lands for all time coming to the crown.
High	8 Feb-22 Dec 1726	GD220/5/1036	Letters to Mungo Graham of Gorthie: John Graham of Killearn
High	8 Sep 1707	GD220/5/761	John Graeme of Killearn to Capt. Thomas Grahame. Killearn
High	9-19 Jan 1715	GD220/5/477	Correspondence of James, 1st Duke of Montrose: William Graham, cousin of Graham of Killearn. The Hague
High	c 21-28 Nov 1716	GD220/5/702	Correspondence of James, 1st Duke of Montrose: Drafts of letters from Montrose, relating to kidnapping of Graham of Killearn and measures to be taken against Rob Roy
High	Mar 1885	CS46/1885/3/153	Decree for payment in maills and duties, The Rt. Hon Colin Baron Blackburn of Killearn, John Blackburn Esq, Andrew Blackburn Esq, and Hugh Blackburn Esq, the accepting and surviving trustees for Miss Isabella Blackburn against Andrew Gray Simpson, Esq of Carfin, and others
High	Mar 1885	CS46/1885/3/154	Decree for payment in maills and duties, The Rt. Hon Colin, Baron Blackburn of Killearn against Alexander Gray Simpson of Carfin and others

APPENDIX 5: Historic Map Sequence



Plate 15: Pont (1583-1596) Map of Scotland – Extract of Killern Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 16: Blaeu (1654) Map of Scotland – Extract of Killern Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 17: Moll (1745) Map of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 18: Roy, General (1747-1755) Roy Military Survey of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 19: Arrowsmith (1807) Map of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 20: Grassom (1817) Map of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 21: Ainslie (1821) Map of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).



Plate 22: Thomson (1832) Map of Scotland – Extract of Killearn Area; National Library of Scotland, <http://maps.nls.uk/geo/explore/> (accessed 08/04/16).

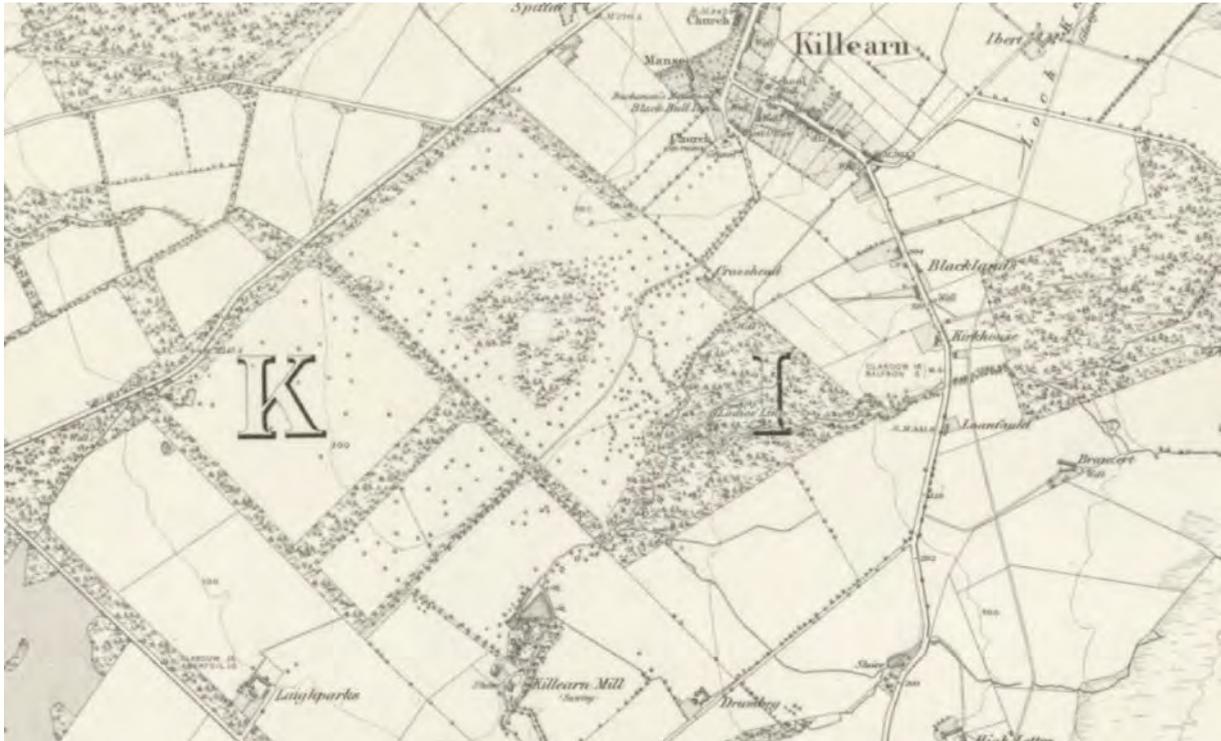


Plate 23: Ordnance Survey (1865) First Edition, 25-inch to the mile- Surveyed 1861, Stirlingshire [New Series] Sheets nXX.7, nXX.8, nXX.11, nXX.12; National Library of Scotland, <http://maps.nls.uk/geo/explore/>, (accessed 08/04/16).

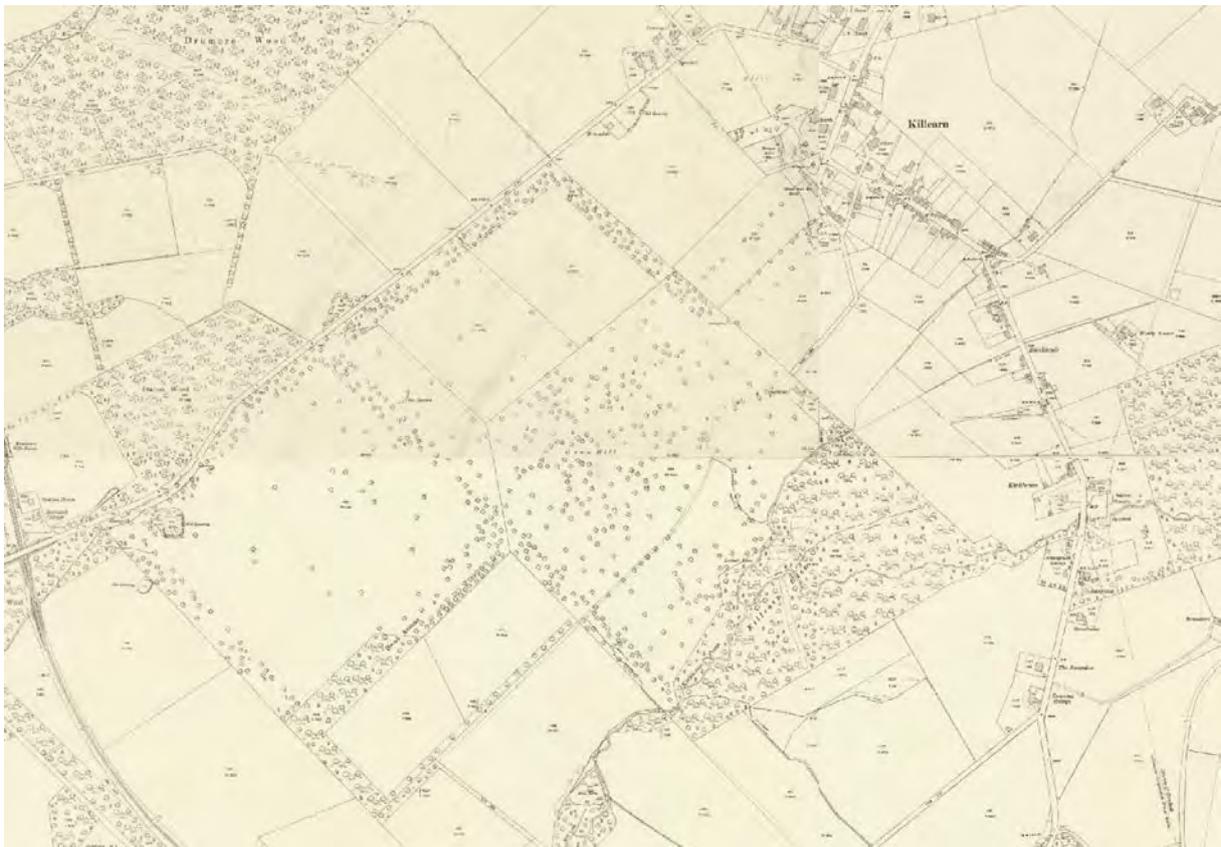


Plate 24: Ordnance Survey (1918) Second Edition, 25-inch to the mile- Revised 1914, Stirlingshire [New Series] Sheets nXX.7, nXX.8, nXX.11, nXX.12; National Library of Scotland, <http://maps.nls.uk/geo/explore/>, (accessed 08/04/16).

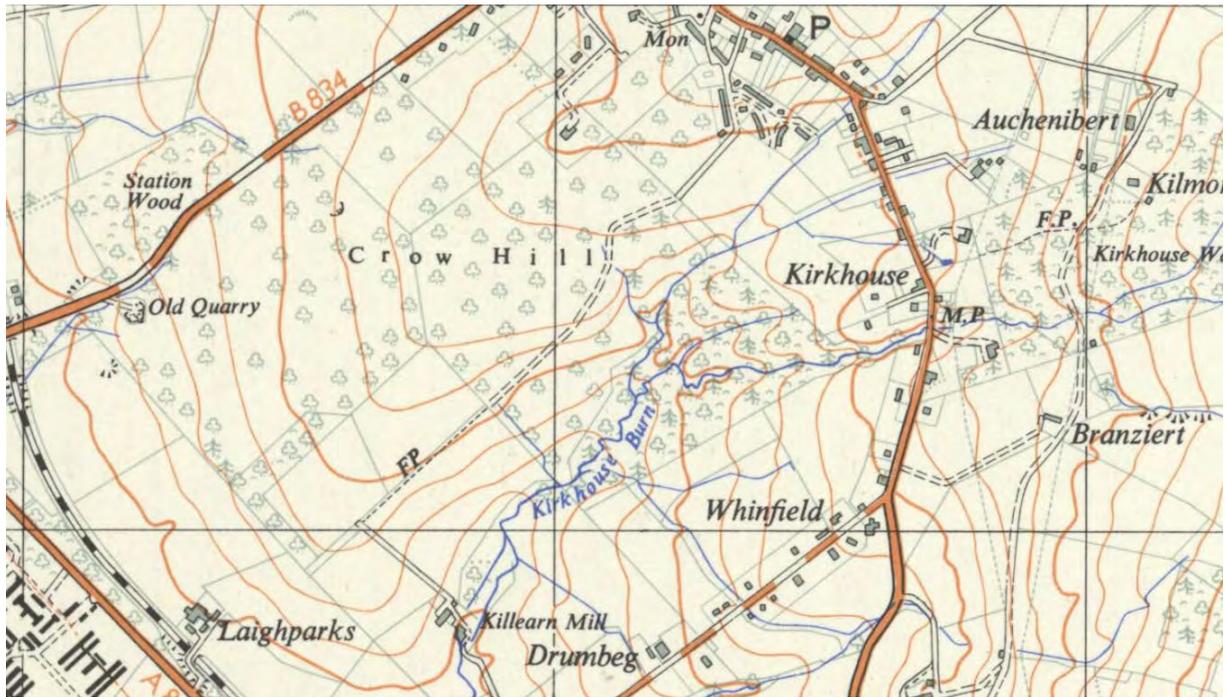


Plate 25: Ordnance Survey (1960) 1:25000, Stirlingshire, Sheet NS58 (Extract); National Library of Scotland, <http://maps.nls.uk/geo/explore/>, (accessed 08/04/16).

APPENDIX 6: DES

LOCAL AUTHORITY:	Stirling Council
PROJECT TITLE/SITE NAME:	Killearn Glen Community Archaeological Project
PROJECT CODE:	0496
PARISH:	Killearn
NAME OF CONTRIBUTOR:	Peta Glew & Coralie Mills
NAME OF ORGANISATION:	Northlight Heritage / Dendrochronicle
TYPE(S) OF PROJECT:	Walkover Survey / Tree Survey / Dendrochronology
NMRS NO(S):	Stirling HER 7076, 7077, 1915, 1915.01 Canmore 348782, 86382
SITE/MONUMENT TYPE(S):	Historic woodland, post-medieval designed landscape.
SIGNIFICANT FINDS:	A rectangular structure (Site 4), which may be late medieval in origin.
NGR (2 letters, 8 or 10 figures)	NS 52250 / 85282
START DATE (this season)	10 th April 2016
END DATE (this season)	8 th May 2016
PREVIOUS WORK (incl. DES ref.)	Geophysical Survey (1993) Glasgow University Archaeological Research Division (GUARD) Small excavation (2012), Murray Cook, Stirling Council & Northlight Heritage. (DES 2012, vol.13, 176)
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	<p>An archaeological walk over survey, rapid assessment and characterisation of the historic woodland and a dendrochronological study of three tree specimens all in Killearn Glen, next to Killearn Village, Stirlingshire was carried out as part of the 'Killearn Glen: Rediscovering the Communities' Lost Landscape Project'. The work was carried out on various dates between 10th April and 8th May 2016 with members of the local community and Killearn Community Futures Company (KCFC) archive group. The work was carried out on behalf of KCFC and complements a wider body of community engagement being undertaken by Green Aspirations Scotland CIC.</p> <p>Twelve new archaeological sites were identified throughout the woodland by the walk over survey, spanning the Late Medieval to Modern periods. The woodland survey transect confirmed that the woodland in Killearn Glen is remarkably diverse in tree age, form and species. The dendrochronology identified Scots Pine and Yew that date to the late 18th or early 19th centuries, and a coppiced oak that was last cut in the inter-war period - providing clues to the management of the woodland over the past two hundred years.</p>
PROPOSED FUTURE WORK:	<p>Further archaeological and historical research in to Killearn Glen is proposed, particularly in relation to a rectangular structure (Site 4), which may be late medieval in origin. Further study of the historic woodland, with Dendrochronological analysis where possible is also proposed.</p> <p>A number of recommendations for the future management of the woodland in respect of the archaeology and historic woodland have also been put forward as addenda to the Woodland Management Plan (Hyde 2016).</p>
CAPTION(S) FOR ILLUSTRS:	None.
SPONSOR OR FUNDING BODY:	Killearn Community Futures Company (KCFC)
ADDRESS OF MAIN CONTRIBUTOR:	Peta Glew & Coralie Mills
EMAIL ADDRESS:	northlight@yorkat.co.uk
ARCHIVE LOCATION (intended/deposited)	RCAHMS (Intended)