

WOODLAND MANAGEMENT PLAN: KILLEARN GLEN



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WOODLAND MANAGEMENT PLAN: KILLEARN GLEN

1. Introduction and Background:

This management plan has been commissioned by Stirling Council. It sets out to review previous management plans and grant scheme agreements for the woodland known as Killearn Glen lying immediately to the south west of the village of Killearn in Stirlingshire before going on to make recommendations for future management of the woodland.

2. Site Details and Context:

2.1 *Location, Access and Tenure*

Killearn Glen extends to an area of 11.9ha and is located immediately to the south west of the village of Killearn, centred on GR NS 523853 (see Map 1, Compartment Map) surrounding Kirkhouse Burn and its tributaries. The site is contiguous with the village along its north-eastern boundary and is surrounded by semi-improved grassland (grazing) and remnant parkland to the north, west and south. The site is approximately triangular in shape, narrowing to the south west.

The site was originally owned by the Gordon Trust but passed to Stirling Council's ownership in 1979 with the condition that public access would be maintained to the site in perpetuity. The site is managed by Stirling Council's Land Conservation Team.

The principal access to the woodland is from Beech Drive where two separate paths enter the woodland and converge after about 20m. There is a further pedestrian access to the woodland from Elm Road. There is currently no formal vehicular access in the woodland although there is a field gate on the south eastern boundary.

2.2 *The Management Plan Area*

Killearn Glen is recorded in the Native Woodland Inventory of Scotland as almost entirely native woodland of mostly ancient origin with only a small area recorded as open land (see Figure 1).⁽¹⁾ A small area within the core of the site is recorded as felled/open land (see Figure 1). In 2000 a management plan (unavailable for this study) was produced for the site which aimed to use Killearn Glen as a timber resource. However, poor vehicular access and limited Council budgets for infrastructure investment prevented any development of commercial use of the woodland. In 2001 a 5 year management plan was prepared for Killearn Glen by Central Lowland Native Woodlands which was then used to secure funding for works through the Forestry Commission's Woodland Grant Scheme (WGS3).⁽²⁾ It would appear from Stirling Council's archive material and the information on Forestry Commission Scotland's Land Information Search that a Rural Development Contract Management Plan was approved for the site in 2012.

The woodland is recorded in the Native Woodland Survey of Scotland (NWSS) as lowland mixed deciduous woodland (W10), with some localised areas of wet woodland (NVC W7) and a sub-community of oak –birch woodland (WLz) (see Section 3.3 for further details). These woodland types are all UK BAP priority habitats for action and are included on the Scottish Biodiversity List.

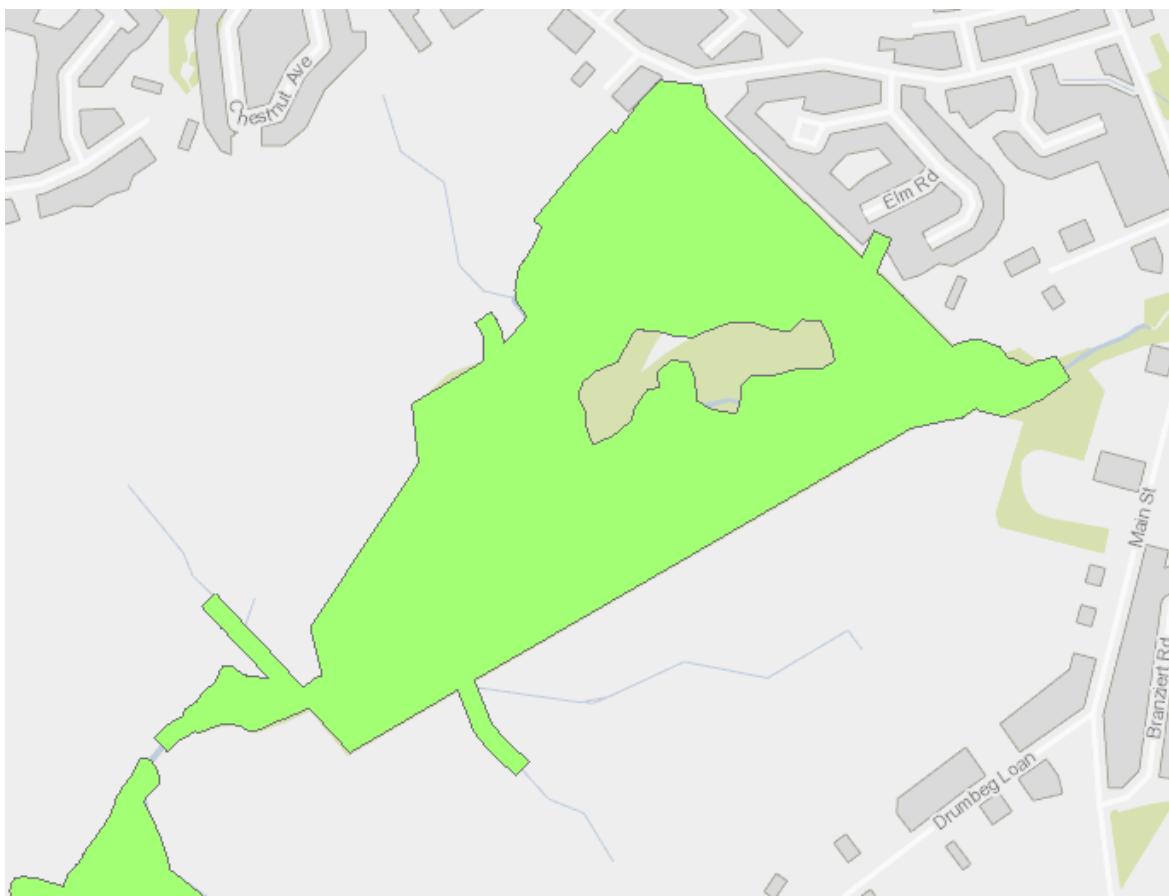


Figure 1: Area (in green) recorded as native woodland in the Native Woodland Inventory of Scotland (from

<http://map.environment.scotland.gov.uk/seweb/map.htm?menutype=0&layers=3>)

2.3 Physical Character and Description of the Woodland in the Landscape

Killearn Glen extends to an area of 11.9ha and occupies an altitudinal range of 50 - 90m (absl). Killearn Glen sits on a south west facing slope below the village and above the floodplain of the Blane River. The underlying geology is Old Red Sandstone overlain by wet, soft mineral soils with weathered sandstone. Soils are generally free-draining although throughout the site there are areas of localised erosion and compaction on some of the paths and standing water associated with blocked drains.

The two main tributaries of Kirkhouse Burn enter the woodland at the north eastern boundary running in a south westerly direction. The burns have eroded the bedrock to form deep gorges in some sections, particularly in the eastern part of the site. There are several smaller tributaries of the burn running through the woodland as well as a network of drains and ditches throughout the site in various states of repair.

The land slopes gently downhill from the north east to south west and is deeply incised by watercourses. The topography of the site means that the woodland is not seen in its entirety from any public viewpoints but forms part of the mosaic of woodland and semi-improved grassland habitat that characterises the area.

The woodland is bound along its south eastern boundary by a random rubble stone wall in good repair for much of its length with a field gate located at approximately GR OS 523 852 with a squeeze stile immediately to the east of it. A further timber stile is located at the southern corner of the site. The remaining boundaries are all fenced with post and wire and /or post and Rylock fencing in various states of repair (sections of the north western boundary are double fenced). There is a network of well-used paths throughout the site mostly in a poor state of repair.

In the (current) SNH Landscape Character Assessment for Central Region (1999)⁽³⁾ within the Landscape Character Area (LCA) covering the study area (LCA 26 Endrick Water and Blane Water) the ‘mosaic of farmland with a relatively high proportion of tree cover’ is a stated positive attribute of the area and ‘enhancement of the woodland structure’ is a Key Strategic Aim.

2.4 *Historic Context* ^(6, 7, 8, 9)

Most of Killearn Glen is recorded in the SNH Ancient Woodland Inventory (AWI).⁽⁴⁾

The north western area of the woodland is recorded as long-established of plantation origin (LEPO) while the remaining area is recorded as being of semi-natural origin (see Section 2.6 Figure 2). The historic maps of the site in Appendix 1 show that the current boundaries of the woodland were defined by 1861 (when surveying was undertaken for the 1st edition OS maps) and have changed little since, although the extent of the surrounding woodland and parkland trees has deteriorated. The 1st and 2nd Edition OS maps also indicate that the woodland on the site during this period was mixed conifer and broadleaved. Extracts from the Aaron Arrowsmith Map of Scotland (1803) and the John Grassom County of Stirling Map (1817) indicate mature broadleaved woodland in the approximate area of Killearn Glen.

Extracts from Roy's Military Map of Scotland, Aaron Arrowsmiths Map of Scotland and John Grassom's County of Stirling Map in Appendix 1 indicate the existence of a large house immediately to the north of Killearn Glen (in what is now known locally as 'the sledging field' or 'cow field') sitting within a planned landscape that extended down into the Glen. The house, known as the Place of Killearn (and also sometimes Old Killearn House) was built in 1688, probably on the site of a previously existing house. Research undertaken by local historian Peter Smith found a description of the Place of Killearn and its grounds in the First Statistical Account for Killearn, written by Rev. David Ure in 1793⁽⁵⁾:

'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. 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 enclosures 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.'

The Ladies Linn, a designed water feature, is one of the few surviving features of the designed landscape associated with the Place of Killearn. As well as the water feature, the banks of the canalised section of the burn are planted with yew trees which enhance the setting of the water feature and create a sense of place. The remains of a haha are evident above the western bank of Ladies Linn which would have been the route from The Place of Killearn into the Glen. Limited excavations along the western edge of the Glen close to the Linn have identified a structure, possibly a 'Tea House' located to provide a view of the Linn. Stirling Councils Archaeologist has suggested that the Linn probably had a figure on the top and the stream below would have been crossed by a bridge designed to give a view of the feature. The Ladies Linn was restored in 1999 by The Killearn Trust and Stirling Council.



Ladies Linn, Killearn Glen

The Second Statistical Account, written by Rev. John Graham in 1841 states that '*The estate of Killearn was purchased in 1814, by John Blackburn, Esq. of Jamaica, who has recently fitted up an elegant mansion house on the banks of Blane.*' This refers to Killearn House which was completed in 1816 and it seems likely that the Place was demolished at this time and the stone incorporated into the new house.
(5)

A geophysical survey of the site in 1993 followed by resistivity surveys indicated a potential site for the Lairds house above the burn in what is now known as the cow field (although it is shown on Canmore located within the woodland).⁽⁶⁾ A more recent trial excavation by Stirling Councils Archaeologist and Northlight Heritage in June 2012 confirmed the presence of the house in the cow field, very little of the remains of which are left in situ. It also identified a formal stairway connecting the house to the Ladies Linn and the remains of a substantial

ornamental gateway to the estate.⁽⁶⁾ The survey also recorded a series of hollow-ways and ancient coppiced oaks, alders and sycamores in the surrounding Killearn Glen woodland. The ancient coppice suggests that the woodland was managed on a commercial basis at some point, albeit on a small scale. The surveyors have speculated that the hollow-ways could be routes used by people in the 15th to 17th centuries to access the woodland to exploit it which were then used for recreational purposes once the site became part of the designed landscape of the Place of Killearn. A network of disused paths within the Glen associated with the designed landscape and the use of the site as a ‘pleasure ground’ is still visible on the ground, particularly during the winter.

In the Second Statistical Account, the Rev. John Graham goes onto say of the larch trees (*Larix*) referred to in the First Account: ⁽⁵⁾

'Besides the usual forest trees, of which there are many beautiful specimens at Killearn, he [the owner of the Place of Kilearn] 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.'

There are still existing stands of larch in Killearn Glen (see Map 2 for approximate extent and locations). A dendrochronological study of the trees is due to be carried out during 2016 to determine the age and origins of the trees. Some of the other species (tulip tree, sweet chestnut and Japanese maple) mentioned in the First Statistical Account planted in association with the development of the designed landscape have long since disappeared. Specimens of some species associated with the designed landscape such as the grove of yews at Ladies Linn

and a few remaining beech and lime trees along the marches still survive. Additional trees associated with the designed landscape can still be found in the field to the north, including several more yews, limes and one Highclere holly '*Camellifolia*' (*Ilex x altaclarensis* 'Camellifolia'). See Map 2 for the locations of trees in and around the Glen that are associated with the remnant designed landscape.

Aerial photographs of the site from 1946 held in the National Collection of Aerial Photographs (see <http://ncap.org.uk/>) show the north western part of the site as open grassland with a scattering of trees. The land adjacent to the eastern and south eastern boundaries is also more open than it is today. The woodland canopy in the central part of the site appears much darker than the surrounding woodland on these 1946 photographs, suggesting that quite a substantial area was planted with coniferous species. This area corresponds with the existing remaining spruce and Scots pine, although the extent and density of these species is now considerably less.

Today the woodland is managed as an amenity woodland, highly valued by the local community for its recreational value as well as for its biodiversity.

2.5 *Statutory Designations*

2.5.1 *Core Paths*

There are 3 designated core paths within the management plan area as shown on map 3 (Access and Recreation Facilities), numbered as follows:

- 9078Ki/29
- 9078Ki/32
- 9078Ki/33

The three core paths link to form a circular path around the site. 9078Ki/29 and 9078Ki/33 merge at the recently replaced footbridge below the entrance to the site at Beech Drive. Core paths 9078Ki/32 and 9078Ki/33 merge near the entrance to the woodland at Elm Road. See Stirling Council's Core Path Plan for further information.⁽⁷⁾

2.5.2 *Tree Preservation Order*

Previous woodland management plans for Killearn Glen make reference to a historic TPO protecting the site. However, Stirling Council's Tree Officer has confirmed that although historic records indicate that the site is protected by a TPO, the Council holds no documents to substantiate this. This is currently under review.

2.6 *Non-statutory Designations and Recorded Features of Interest*

2.6.1 *Ancient Woodland Inventory⁽⁴⁾*

Figure 2 shows the extent of the woodland at Killearn Glen recorded in the Ancient Woodland Inventory (AWI). The woodland along the north western boundary is recorded as Long-Established of Plantation Origin (LEPO) woodland, some of which originates from the development of the designed landscape. The remaining woodland area is almost entirely recorded as ancient woodland of semi-natural origin.

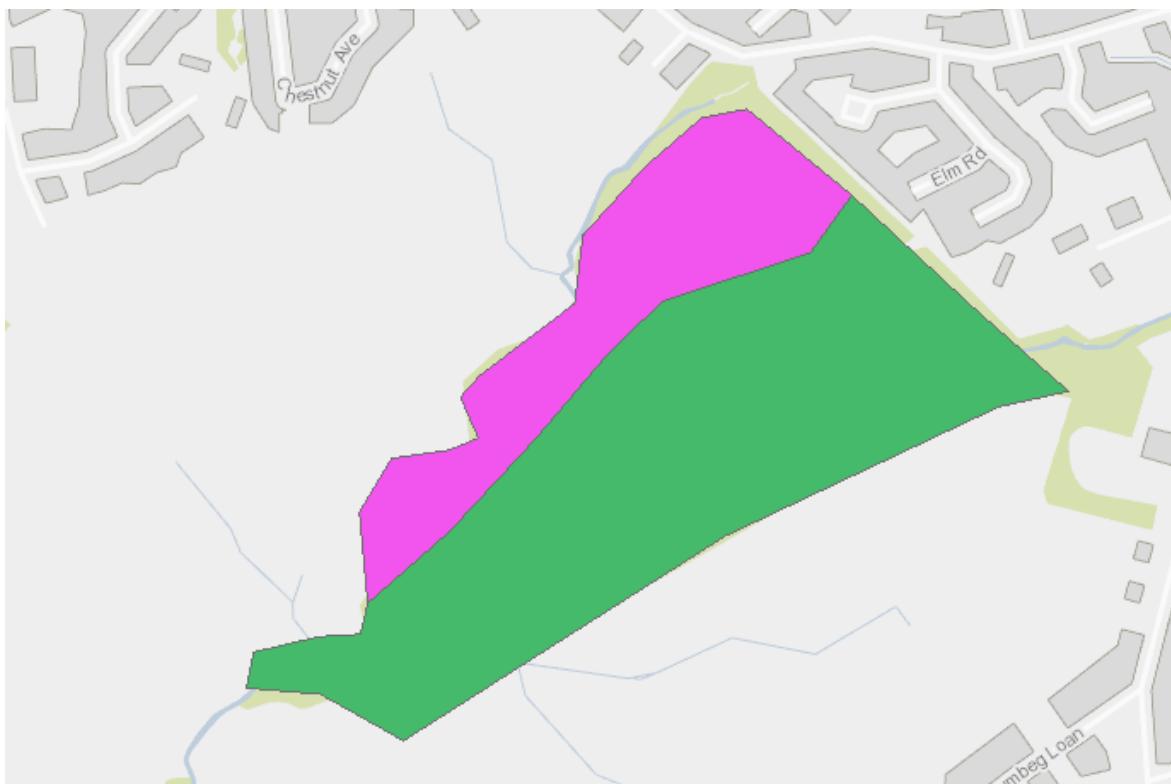


Figure 2: Area of woodland at Killearn Glen recorded in the Ancient Woodland Inventory.

Pink represents LEPO woodland and green represents woodland of semi-natural origin.

2.6.2 Scottish Wetland Inventory⁽⁹⁾

That part of the site recorded in the AWI as ancient woodland of semi-natural origin is recorded in the Scottish Wetland Inventory as ‘non-specific’ wet woodland.

2.6.3 National Forest Inventory⁽¹⁰⁾ and Native Woodland Survey of Scotland⁽¹⁾

The entire site is recorded on the National Forest Inventory as broadleaved woodland. In the Native Woodland Survey of Scotland the site is recorded as lowland mixed deciduous woodland.

2.6.4 Ancient and Historic Monuments of Scotland Records (RCAHMS)⁽⁶⁾

There are currently two features within the study area recorded by RCAHMS as

Historic Environment Records. The first is recorded as the Lairds House (or the Place of Killearn) and is shown on Canmore to lie within the woodland (Canmore ID 86382) although studies have indicated that it was more likely to have been located in the field to the north of Killearn Glen. The haha at Ladies Linn is also recorded (Canmore ID 348782).

3. Existing Management and Use:

3.1 *Overview of Recreation, Access and Tourism*

At the 2011 census Killearn had a population of 1701. Stirling Council's archive information on the site cites Killearn Glen as having an average of 82 visits per day which equates to 29,930 visits per year. The majority of users are local residents who use the site for informal recreation, particularly for dog walking. Occasional community activities and organised events take place in the Glen throughout the year. There is little evidence to suggest that the woodland is used for cycling or horse-riding.

The woodland was passed to Stirling Council by the Gordon Trust in 1979 with a condition that the site would remain open and free for public access.

There is a well-established path network through the site, some of which is shown on Map 3 (Access and Recreation Facilities) and which extends beyond the core path network. The path network within the site links with various established footpaths that extend beyond the site boundary including two long established routes; one that enters/exits the site at the south western corner of the site via a wooden stile (marked with a Stirling Council footpath sign) and; one that enters/exits the site via a squeeze stile built into the wall near adjacent to the field gate on the south eastern boundary (see Map 3). The squeeze stile was constructed during a community walling project within recent years. There are

further informal entry/exit points along the boundaries that appear to have been created more recently including one at Ladies Linn and one near the south eastern corner of the site. There are two further step stiles in the southern boundary wall in the approximate locations shown on Map 3 which do not appear to be in regular use anymore but provide access into the wood from a well-established linear path that follows the length of the wall on the field side.



Stirling Council stile and way-marker at the south eastern boundary

The path network is generally informal and although some improvement and upgrading has been undertaken at various times over the years, the paths are generally in poor condition, particularly during the winter months when poor drainage combined with heavy use leaves large sections of the path network muddy and difficult to negotiate.



Large sections of the footpath network are in poor repair

In 2015 Stirling Council replaced two footbridges across Kirkhouse Burn that were no longer fit for purpose. One of the bridges was built from larch harvested and processed on site.



New bridge over Kirkhouse Burn made from larch harvested and processed on site

On-site interpretation of the woodland is currently limited to a Stirling Council interpretation board at the main Beech Drive entrance. During 2015, as part of a

district-wide initiative, Stirling Council commissioned a bespoke sculptured timber bench for Killearn Glen. The bench depicts Ladies Linn and local wildlife found in the Glen. A dog waste bin (maintained by Stirling Council) is located at the main Beech Drive entrance to the site. There are no other formal facilities within the Glen.

The majority of visitors to the site arrive by foot. There are no formal parking facilities and street parking on Beech Drive appears to provide adequate parking for the site.



Bespoke bench carved by Iain Chalmers of Chainsaw Creations

3.2 Overview of Social and Community Interests

In the past Killearn Glen was used occasionally by Stirling Council Ranger Service for guided walks and talks, but as staff resources have declined, there is no longer capacity within the Ranger Service to provide this service. Volunteer task days are still organised with the Community, particularly the Killearn Paths Group and supervised by Stirling Council as landowners. Works undertaken have included

path building and maintenance, bracken pulling and walling. Stirling Councils Archaeologist has also held community events and digs within the woodland and on adjacent land.

Other independent groups including Forth Valley Orienteers have held events within the woodland in the past.

Fly-tipping and litter are minor on-going issues in the woodland. Tipping of garden waste at the entrances and along the north-eastern boundary has resulted in the introduction of garden escapees into the woodland.

Anti-social behaviour is an occasional problem, particularly during the summer months. In 2003 Stirling Council introduced a by-law prohibiting the consumption of alcohol in any public place in Killearn which includes Killearn Glen. An Alcohol Free Zone sign at the main Beech Drive entrance to the site reminds visitors that breach of the by-law carries a £500 fine.

The Killearn Community Futures Company (KCFC) is a charitable organisation established in 2003. The Company aims:

- To provide, in the interests of social welfare, facilities for recreation and other leisure time activity available to the public at large within the Community Council area of Killearn.
- To preserve restore and improve the environment in and around Killearn through the provision, maintenance and/or improvement of public open space and other amenities and other regeneration projects.
- To promote, establish and operate other schemes of a charitable nature for the benefit of the community of Killearn.

KCFC acts as an umbrella organisation for several local groups including the Paths Group, the Woodlands Group, All Killearn Archives and several other local community groups. The Company has recently successfully applied for a Heritage Lottery Fund grant to fund further research into several features of Killearn Glen and The Place of Killearn in partnership with Stirling Council and Green Aspirations, a locally-based social enterprise company that specialises in outdoor education, volunteering and community engagement. During spring 2016 Stirling Councils Archaeologist and Ranger Service in partnership with Green Aspirations will assist KCFC in the delivery of the Rediscovering the Community's Lost Landscape project, a series of projects and community events that will explore the Place of Killearn and its designed landscape as well as the origin and past uses of the hollow-ways. The project will also investigate the dendrochronology of the ancient oak coppice and the stand of larch thought to be associated with the Place of Killearn.

3.3 Overview of Biodiversity Interests

The main biodiversity interests at Killearn Glen are associated with its ancient woodland status. The Native Woodland Survey of Scotland (NWSS) (2012) identified all of the woodland at Killearn Glen as lowland mixed deciduous woodland. In Scotland this priority habitat encompasses a wide range of lowland woodland types, on well-drained soils ranging from base-rich to acidic. In Scotland, W8 (*Fraxinus excelsior* – *Acer campestre* – *Mercurialis perennis*) and W10 (*Quercus robur/petraea* – *Pterididium aquilinum* – *Rubus fruticosus*) are the most common NVC communities in this habitat. The NWSS classified woodland to community level only, and included all examples of W8, W10 and W16 as well as a sub-community defined as WLz (oak-birch woodland with a field layer dominated by *Luzula sylvatica*) within the lowland mixed deciduous woodland priority habitat.⁽¹¹⁾ The slightly acid soils of Killearn Glen mean that W10 and WLz are both well represented while the wet woodland in compartments 1 and 4

resemble W7 (*Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum*) more than W8 due to the wet mineral soils of the site.

The presence of beech and sycamore within the woodland confuses the definition of the NVC woodland types.

The Native Woodland Survey of Scotland estimated that only 8% (approximately 23,200ha) of native woodland in Scotland is lowland mixed deciduous woodland. This woodland type is thought to have declined in extent throughout the UK by 30-40% over the past 50 years as a result of clearance, over-grazing and replanting with non-native species. It is a UK priority habitat for conservation and is included in the Scottish Biodiversity List.

3.4 Habitat Network

Killearn Glen provides an important link in the wider green network of the area. The burns in particular provide important habitat links with the surrounding countryside. The woodland at Killearn Glen provides an integral part of the woodland habitat network extending throughout the area linking to Kirkhouse Woods to the east and woods at Killearn mill to the south west. There are significant opportunities in the wider area to strengthen the woodland network particularly around riparian edges and field boundaries. Killearn Glen is a key site in delivering the vision set out in Stirling and Clackmannan Forestry and Woodland Strategy⁽⁷⁾:

'Through their expansion, protection and sustainable management, the forests and woodlands of Stirling and Clackmannanshire will provide a range of benefits for local people and visitors and contribute to economic, environmental and social well-being.'

Through partnership working and integrated planning, implementation and monitoring, new jobs will be created, opportunities provided for active and passive outdoor recreation, habitats enhanced for wildlife and attractive landscapes protected, so that local people can live and work and visitors enjoy the area's natural and cultural heritage.'

The land surrounding Killearn Glen to the north west, south east and east is all semi-improved grassland, most of which has not been grazed for some time and is now rank with aggressive species as a result. The Gordon Trust intends to re-introduce cattle to the sledging/cow field to the north west of Killearn Glen in spring 2016.

3.5 Other Biodiversity Interests

Currently there is no biological recording within the woodland although a variety of nesting birds are known to be present within the site. There is a resident population of roe deer within the woodland but grazing is still at a sustainable level. Bats are also likely to be present and badgers may forage within the site. The wide age range and species composition of the woodland and the presence of significant amounts of deadwood suggest that there will also be some invertebrate interest. The ancient woodland status and presence of large amounts of deadwood mean that lower plants are likely to be well represented on the site. Kirkhouse Burn and its tributaries are likely to support a wide variety of species, including otters.



Ice hair at Killearn Glen (formed in association with the fungus Exidiopsis effusa).

(Picture courtesy of Norman McNab)

3.6 Overview of Previous Woodland Management Grant Applications

Table 1 shows a summary of previous successful grant applications (from FCS Land Information Search⁽¹⁰⁾).

Grant Scheme	Property Details	Case ref/ Property No.
RDC	Stirling Council – Killearn Glen	MPL 330025
WGS3	Stirling Council – Killearn Glen	3300/958

Forestry Commission Scotland Land Information Search and Map Viewer indicate two previously approved grant schemes. An agreement under WGS3 approved Annual Management Grant, Woodland Improvement Grant and selected thinning

of existing natural regeneration. A RDC Management Plan was later approved in 2012. The management plan proposed upgrading of the footpath network, litter picking, repair and maintenance of boundaries, gradual removal of non-native species and promotion of natural regeneration of native species. It is not clear from the current site condition what if any of the proposed works have been undertaken under these agreements, although site maintenance works including replacement of the bridges, bracken clearance, tree felling and remedial surgery work and path repairs have been undertaken by Stirling Council sometimes with the assistance of local volunteer groups.

Discussions between the SC Ranger responsible for the site and The Gordon Trust has resulted in an agreement to replace the fence along the north western and western boundaries of the woodland during spring 2016 in advance of stock being re-introduced to the field. A gate suitable for vehicular access will be installed on the western boundary during these works.

Currently there are no Stirling Council staff dedicated to the site. The Council Ranger for the area visits the site twice a month to undertake visitor safety inspections and check on the condition of infrastructure. In the past the Council's maintenance team would have undertaken regular works as part of the Council's core works programme, but as a result of reduced resources, work is now undertaken on a reactive basis following requests from the Ranger for specific works. The local community, particularly the Killearn Paths Group, under the supervision of Stirling Council, undertakes maintenance works through work parties but the Path Group covers the Killearn Community Council area so only limited resources are available for Killearn Glen.

4. Site Description (by compartment):

Killearn Glen is located immediately to the west of the village of Killearn and

although in close proximity to the nearby housing estate, the site has retained its rural semi-natural character. Only the area of woodland immediately adjacent to the housing on the north eastern boundary has been significantly affected by the proximity of the village where dumping of garden waste has resulted in garden escapees colonising the area and tree removal/tree surgery has resulted in a change to the character of the site. As outlined above (Section 3.1) the main pedestrian accesses to the site are from Beech Drive where a threshold sign, interpretation board and dog waste bin have been installed by Stirling Council at one of the entrances.



Threshold and interpretation sign at one the main Beech Drive entrance

For the purposes of this management plan the site has been divided into 6 management compartments as shown on Map 1 Compartment Map.

4.1 *Compartment 1 (5.0ha)*

This is the largest compartment within the woodland and is predominately NVC W10 woodland and comprises much of the land lying between the two tributaries

of Kirkhouse Burn. Much of the site is well-drained and supports woodland dominated by oak and birch with beech and sycamore present as minor species. An area of wet woodland (W7) follows a wet flush and ditch that extends from the Elm Road entrance westwards. Much of the alder within this wet flush has been coppiced in the past. There are some groups of mature larch throughout the compartment (see Map 2). The woodland is generally of low density with occasional areas of dense pole stage regeneration (dominated by oak, birch and rowan) and open glades dominated by bracken. There are occasional old oak coppice stools but the majority of mature trees within this compartment are standards. Occasional very large oak specimens are present with wide, open-grown canopies. Occasional Scots pine specimen trees are also found throughout the compartment. The 1946 aerial photograph of the site shows the northern section of this compartment as open grassland with occasional trees. Subsequent oak and birch regeneration has restocked the site but there is a lack of understorey species with only occasional hazel and holly present. Bracken and *Rubus spp.* dominate the ground layer in the more open mature woodland as well as in the open glades.

Some felling has been undertaken adjacent to the houses along the eastern boundary resulting in dense colonisation with pioneer species including ash, elder, rowan and willow. Bracken and *Rubus spp.* have created a dense field layer. Tipping of garden waste in this area has resulted in colonisation with garden escapees. *Lamium spp.* in particular is colonising the field layer and outcompeting native species. There are some exceptionally large specimen oaks adjacent to the eastern boundary which are an important feature of the site. Beech regeneration is becoming well-established on the drier soils of the compartment. A small area of Himalayan balsam was found in Kirkhouse Burn in summer 2015 within compartment 1.



A stand of W10 in Compartment 1

As well as all three core paths, there is a network of other well-used paths through compartment 1. Generally all of the paths are in poor repair and in need of some maintenance.

Several trees have collapsed into the burns. Windthrow of trees is evident within the compartment within mature stands. Over recent years, woodland management appears to have been limited to those trees within falling distance of the path network and adjacent gardens and bracken control by cutting and spraying.

The post and wire fence along the Beech Drive boundary is in poor repair. Along the boundaries contiguous with the adjacent housing, fencing is generally stockade fencing belonging to the houses. The fence bordering the sledging field/cow field is a mix of post and wire and post and Rylock and is in poor repair where it still stands.



Pole stage regeneration in Compartment 1

4.2 Compartment 2 (2.2ha)

This compartment comprises the woodland lying to the south of Kirkhouse Burn extending west almost as far as the field gate in the boundary wall. This area has no core paths and appears to be less intensively used than the rest of the woodland. There are access points in the wall (both formal and informal) from the field to the south into the woodland, although the two step stiles in the wall no longer appear to be in use (see Map 3 for locations of access points). The woodland here is very open and the ground flora is dominated by dense beds of either bracken or greater wood rush (*Luzula sylvatica*) indicating the sub-community WIz described in Section 3.3. The principal species are oak and birch mostly present as standards with rowan. There is a large amount of standing and fallen deadwood. Occasional stored oak coppice is also present, particularly along the south eastern boundary.



Stand of sub-community Wlz in Compartment 2

Beech regeneration is becoming well-established throughout the compartment. There are some remaining over-mature beech trees along on the southern boundary that represent some of the few remaining boundary beech trees planted as part of the designed landscape. The trees are in poor condition and have suffered extensive storm damage.

The drystone dyke forming the southern boundary of the woodland and compartment 2 is in reasonable repair with only a few breaches requiring repair. Two step stiles have been built into the wall (see Map 3 for approximate location).

4.3 Compartment 3 (1.7ha)

Compartment 3 comprises the south western part of the site. The majority of the ancient oak coppice stools are found within this compartment suggesting that it was actively worked possibly over a long period of time. Between the coppice stools the woodland is relatively even aged and much younger. It seems likely that it may have been wood pasture at one stage while the oak was coppiced and the woodland has regenerated once grazing has been removed.



Stored coppice stool in Compartment 3

There is a depression in centre of the compartment which is permanently wet (see Map 2 for locations). There is some speculation that this may have been a curling pond at the time the Place of Killearn was in existence. Further investigation of this feature to determine its origins is proposed as part of the Lost Landscape project.

At the western end of compartment 3 one of the last surviving substantially intact beech trees planted on the marches as part of the designed landscape was recently found to be diseased and in a potentially dangerous condition. The tree has been ‘veteranised’ in order to make it safe and retain it on site for as long as possible. A further over-mature beech on the south western boundary has only a small area of crown still live. Prolific beech regeneration is colonising this edge of the woodland which has been opened up through loss of trees over a number of years.



Veteranised beech tree on western boundary

4.4 Compartment 4 (0.6ha)

This compartment occupies the north western part of the woodland. The compartment slopes steeply down to the burn from the north western boundary with the sledging/cow field to Kirkhouse Burn. Mature /early-mature oak and hazel are the principal species on the free-draining upper slopes with some sycamore and ash regeneration. On the lower slopes sycamore and ash are present as well as oak. Around the burn alder- ash (W7) woodland dominates the poorly drained mineral soils.

Windthrow is evident throughout the compartment resulting in a large amount of deadwood. Fallen branches and trees have caused damage to the boundary fence and several remaining trees require remedial works to make them safe prior to the replacement fence being erected.

4.5 Compartment 5 (1.3ha)

The majority of the remnant features of the designed landscape associated with

the Place of Killearn are found within Compartment 5. Ladies Linn, the groves of yew trees, the haha and the remains of what is thought to be a ‘tea room’ built into the haha are all found in Compartment 5. The designed landscape clearly extended beyond Compartment 5 but within Killearn Glen the majority of visible features are found here. The site is to be further assessed through the Lost Landscapes project.



Windthrown beech has damaged the haha

The yews are an important feature of Killearn Glen and create a sense of place around Ladies Linn. It is likely that the designed landscape planting around Ladies Linn was more extensive in the past and incorporated more species than exist on the site today (see Section 2.4). Several yews within the sledging/cow field also survive as well as a Highclere holly (*Ilex x altaclarensis* ‘Camellifolia), which assuming it formed part of the planting of the grounds of the Place of Killearn, would have been an unusual plant at the time. Stands of self-sown sycamore with some oak and beech now surround the burn. Recent windthrow within the compartment has caused some damage to the haha stonework. Some trees growing on the banks of the burn have also been partially windthrown.

Also within Compartment 6 is a stand of mature larch. This is a significant feature of the site and the trees are thought to have some association with the Place of Killearn and its designed landscape. The dendrochronology of the trees is to be investigated as part of the Lost Landscapes project. One of the trees was recently felled and the timber used to construct a replacement bridge over the burn on the core path (see Section 3.1).

4.6 *Compartment 6 (1.1ha)*

This compartment comprises the central area of the woodland where several paths converge. There are stands of mature Norway spruce and Scots pine with some good specimen trees. The spruce and pine are an important component of the site and contribute to the character of the woodland. They are also an important component of the skyline of the woodland from external viewpoints, particularly views from the north. There is no evidence of natural regeneration of spruce or pine within the compartment. Old aerial photographs of the site indicate that the existing spruce and pine are the remnants of what was once a more extensive plantation. As well as the conifers, other species present include sycamore, birch and hazel with some oak around the burn and establishing beech regeneration. The species and age composition suggests that the site has been colonised following felling/thinning within the last 40 years or so. Lack of thinning has resulted in suppression of the regenerating broadleaved component. Of particular interest in Compartment 6 are the ‘hollow ways’. It is thought that these routes may have been used from the 15th – 17th centuries as drover’s routes as well as routes into the Glen to exploit the timber resources before being incorporated into the Place of Killearn designed landscape as recreational paths in the 18th century.



'Hollow-way' in Compartment 6.

5. Evaluation:

As a 11.9ha ancient woodland contiguous with the village, Killearn Glen is an important resource in terms of its biodiversity, recreation and amenity value. The site is of high amenity value and contributes to the setting and character of the village. The woodland and the surrounding fields are greatly valued and used by local residents for informal recreation.

Lack of biological recording means that little information is available on species present or using the site. However it is clear that the woodland forms an important link in the wider habitat network of the Blane valley. The woodland carries no formal designations. However, the woodland communities identified within the site (NVC W7/W8 and W10) are all woodland types belonging to

lowland deciduous woodland, a UK BAP priority habitat and listed on the Scottish Biodiversity List. It is also a priority habitat for action in the 2012 – 2020 Stirling BAP (draft). The only species known to be present within the woodland of conservation concern at national, regional and local scales is *Hyacinthoides non-scripta* (bluebell), which, due to its continued and often dramatic decline, is now listed on Schedule 8 Wildlife & Countryside Act 1981, part updated but not replaced by the Nature Conservation (Scotland) Act 2004.

Other protected species including bats, badgers and otters may use the site but currently there are no species records to substantiate this.

Despite its proximity to the village, the woodland has retained its rural character and does not suffer from many of the issues normally affecting woodlands close to urban areas. The main management issues at present relate to the condition of the footpaths, boundaries and trees adjacent to footpaths.

The ecological and amenity value of the woodland may have been compromised to some degree by the relatively high levels of use and colonisation of the site by sycamore and beech. Garden escapees and Himalayan balsam will further compromise the biodiversity and amenity value of the woodland if not controlled as may any increase in visitor numbers to the woodland.

The possible cultural and historic importance of the Glen is to be investigated through the Rediscovering the Community's Lost Landscape during spring 2016.

6. Constraints/Threats:

6.1 Social Impact

Killearn Glen experiences a relatively high level of use due to its proximity to the

village. The majority of visitors appear to use the site responsibly and there is no evidence on site of misuse or anti-social behaviour. Dog walking appears to be the main recreational use of the site. The path network is extensive and informal for much of its extent. However, on the more heavily used routes there is evidence of operations undertaken over a period of many years to improve the wearing surface and to define the routes. The construction and wearing surface, however, is not suitable for the high level of use the site receives and it is currently in poor condition throughout much of its length. As noted above (section 3.6), the Gordon Trust intends to re-introduce stock into the cow field to the north of the Glen during 2016. This field is well-used by dog walkers and it is likely that some of this use will be displaced to Killearn Glen once stock is present on site.

6.2 *Herbivore Impact*

There are small resident roe deer and rabbit populations within the woodland which are having an impact on the level of natural regeneration. The Native Woodland Survey of Scotland has assessed the herbivore impact throughout the woodland as ‘medium’. The medium impact rating means that whilst some regeneration will be able to occur, the more vulnerable species (e.g. oak, birch) may not be able to regenerate, so the species diversity and the amount of regeneration will be restricted to some extent. However, while there is a lack of recent oak regeneration on the site the level of browsing has clearly fluctuated over recent years as areas of natural regeneration (of oak, birch and rowan) are present in Compartment 1. Ash is regenerating freely on parts of the site, particularly in Compartment 4 and in the damper areas of Compartment 1. Beech regeneration is also prolific in some areas and localised areas of sycamore regeneration are found throughout the site. Native understorey species are largely absent throughout much of the woodland. The boundaries are in poor repair and provide no barrier to herbivores.

Absence of herbivore management over a long period of time may result in a change in species composition of the woodland.

6.3 *Invasive Non-native Species (INNS)*

The Native Woodland Survey of Scotland has recorded INNS as absent from Killearn Glen. However, a small patch of Himalayan balsam was found in Kirkhouse Burn in summer 2015.

Colonisation of the woodland by garden escapees also poses a threat to the woodland, albeit in localised areas at present. As noted above, *Lamium* is dominating the ground cover in parts of Compartment 1 (mostly confined to the north eastern boundary contiguous with the village).

6.4 *Non-native Canopy Species*

Sycamore is a major species in compartment 5. It seems likely that the species has regenerated naturally to replace species planted as part of the designed landscape at Ladies Linn. Sycamore appears as a minor species in all other compartments. Although regeneration is not dense at present, this species could pose a significant threat to the W10 native woodland communities on the site if left unchecked.

Beech appears to have been introduced to the site as march trees defining the boundaries of the site, again probably in association with the Place of Killearn. Very few of the trees are left and those that survive have very little crown remaining. The final last intact tree on the western boundary was veteranised in 2015 to manage the risk associated with its decaying structure. The legacy of these beech trees however, can be seen throughout the woodland as beech regeneration at various stages from sapling through to early mature specimens.

Beech is less palatable to deer than most native species and so more likely to survive to establishment if retained. If the beech is retained and allowed to mature the structure and composition of the stand types will significantly alter over time and the semi-natural characteristics of the woodland will be lost.

6.5 **Plant Health Risk**

Plant health has become an increasing issue in Scotland over the past decade. The introduction and rapid spread, often with devastating consequences in tree populations of several diseases new to the UK has highlighted the importance of biosecurity and monitoring of plant health.

There are currently no known plant health issues affecting Killearn Glen. However, the site is at risk from the following diseases:

Phytophthora ramorum: *P. ramorum* causes extensive damage and mortality to a wide range of trees and plants including larch and beech. Although larch is a minor species at Killearn Glen the existing stands are of high amenity value and may also be of historic interest (see comment in Section 2.4).

Phytophthora cinnamomi: *P. cinnamomi* causes extensive damage and fatality to a very wide range of trees and plants including yew trees. Several outbreaks of the disease in the wider area has resulted in the death of important stands of yews, for example at Ross Priory on Loch Lomond and at Balloch Country Park.

Hymenoscyphus fraxineus (Chalara dieback of ash): Ash is a minor component of the woodland at Killearn but should be present within the stand type, particularly in base rich flushes. Confirmed infections of Chalara were reported in the wider environment around Killearn in 2015. ⁽¹²⁾

Dothistroma Needle Blight (DNB) (*Dothistroma septosporum*): DNB is found on a range of conifer species but pine (*Pinus spp.*) are by far the most common species with an increase in the distribution and severity of the disease on Scots pine being observed throughout Scotland.

6.6 Tree Safety and Site Maintenance

As noted above Killearn Glen receives a high level of recreational use by the local community, particularly dog walkers. Much of the tree stock surrounding the path network is mature and over-mature and tree safety will be an on-going issue. Tree safety on the site is currently managed on a reactive basis based on tree safety surveys undertaken by the SC Ranger twice a year. While in the past the Council's maintenance team undertook regular works within the site that formed part of the teams' core works plan, including leaf-blown, grass-cutting, spraying herbicide, maintenance of gates, fences, furniture etc., lack of resources within the Council means that work is now undertaken on a reactive basis and only as necessary. This situation is unlikely to alter in the near future.

7. Vision and Objectives:

7.1 Vision

In 20 years it is envisaged that Killearn Glen will continue to be an important part of the local landscape and that the NVC types that occur naturally on the site will be well-represented. The woodland will be developing a diverse age and species structure, including understorey and field layers and will be an important part of the habitat network of the wider area. The habitat value of the woodland for associated species will be improving. Specimen conifers and species associated with the designed landscape will still form part of the woodland composition in appropriate locations. The historic environment and cultural heritage interests of

the site will be protected and valued and the history of the site will be well-understood and interpreted. The remaining features of the designed landscape and earlier periods of use will be well-managed to prevent further deterioration. The woodland will continue to provide a high quality visitor experience and be an important community recreational and educational resource. The local community will be involved in the management of Killearn Glen and will have a sense of ownership of the site. The path network will be well-managed and maintained providing access for a range of users. The woodland will be free of non-native invasive species and disease.

7.2 *Objectives*

The principal objectives of management at Killearn Glen are to:

- Manage the woodland in favour of native species to ensure conservation and enhancement of the NVC communities that exist on the site by thinning/felling to maintain sycamore and beech as minor canopy species and encourage natural regeneration of native species and development of an understorey (through enrichment planting where appropriate);
- Manage the woodland to enhance the habitat for associated woodland species;
- Eradicate Himalayan balsam and ensure that the site remains free of damaging invasive species;
- Eradicate garden escapees;
- Manage herbivore impact within the woodland at a sustainable level;
- Develop a varied age and woodland structure by felling, thinning and enrichment planting where necessary;
- Explore the history of the site and ensure that features of interest are identified and managed;

- Develop and implement an interpretation strategy, focussing on the natural and historic interests of the site;
- Develop and implement a recreation strategy that encourages sustainable use of the site, and that accommodates access for a range of users via a robust, well-maintained path network and provision of an appropriate level of facilities;
- Ensure on-going safety of site users through the implementation of a Tree Risk Strategy (STORMS);
- Investigate opportunities for developing links with the wider path network of the area;
- Investigate opportunities for the community to assume management of the site;
- Monitor activities and outcomes throughout the life of the Management Plan.

8. Opportunities:

8.1 *Site-Wide Opportunities*

Killearn Glen is lowland mixed deciduous woodland (LMDW), a UK BAP priority habitat. The woodland would benefit from some on-going active management to ensure biodiversity and amenity interests of the woodland survive in the long-term. The increasing dominance of sycamore and beech in the canopy and lack of natural regeneration of native canopy and understorey species means that the woodland interest may be compromised permanently without intervention. There is therefore considerable opportunity within to manage the woodland in accordance with the SNH priorities for management of LMDW (see <http://www.snh.gov.uk/docs/A1509047.pdf> for more information) as follows:

- Maintain a good diversity of species, sizes and age classes of trees and shrubs;
- Encourage diversity in the structure and species composition of the ground vegetation;
- Maintain rich assemblages of bryophytes and lichens where they occur;
- Maintain good quantities of standing and fallen deadwood;
- Control the extent and spread of non-native trees and shrubs.

Killearn Glen experiences a relatively high level of use, particularly by local dog walkers, which may potentially increase once stock is re-introduced to the adjacent cow field. The path network is extensive for a relatively small site and currently in poor condition for much of its length. It is likely that some routes have developed as alternatives because of the poor condition of the principal routes. There is an opportunity to rationalise the path network and improve and upgrade the wearing surface of the formalised routes to reduce damage to the woodland and improve visitor experience. The formal route should not be limited to the core path network (although this should be included within it) and should include the path to Ladies Linn. The Killearn Paths Group should be involved in any decisions relating to the path network.

Currently the poor condition of the paths limits use of the site to more able walkers only. There are therefore further opportunities to explore the development of an all-abilities circular route through the Glen opening up use of the site to a wide range of users.

The community have expressed a desire to explore opportunities to link the village to the West Highland Way to encourage more visitors to the village. There is an opportunity to explore the creation of a link from the village through Killearn Glen and the surrounding land to the WHW either via Mill House Wood to the south west or across the field to the south to link with Dobbie's Loan.

The level of way-marking in Killearn Glen is insufficient for new visitors to navigate their way around the site. However, upgrading of the path network may obviate the need to upgrade this once a circular route is clear on the ground. If upgrading of the path network is not likely to take place in the near future, some way marking should be considered.

Tree health and condition is a major on-going management consideration within Killearn Glen that requires addressing through the implementation of the Stirling Tree Operational Risk Management Strategy (STORMS) for the site to ensure continued visitor safety.

The Community is aware that the site and the surrounding area has a rich history and the Rediscovering the Community's Lost Landscape project seeks to explore this. There may be opportunities to restore features and revive previous management regimes if research deems this appropriate. The research and investigations conducted through this project will not only inform future management decisions for the site but could provide information for some unique site interpretation that bring the lost landscapes back to life through visualisations and interpretation through a variety of media. Currently the only interpretation for Killearn Glen is a welcome information panel at one of the Beech Drive entrances. Introduction of too much on-site furniture such as interpretation boards could result in clutter. While there is an opportunity to include some low-key on-site interpretation, such as at Ladies Linn and at the viewpoint at the western boundary, other forms of interpretation could be considered such as the development of a mobile phone 'app' or provision of QR codes on gates and stiles at the site entrance points that guide the visitor around the site, providing interpretation at features of interest. This would allow interpretative material to be altered regularly, for example, as the seasons change and potentially

encourage more use of the site for education by the local school and nurseries as well as local interest groups.

There are opportunities at Killearn Glen to significantly improve the biodiversity value of the site. Initially priorities should focus on establishing systems of biological monitoring and recording to provide a better understanding of wildlife within the area. This will guide future management and enhancement works.

There is also scope to encourage volunteers taking part in existing ‘citizen science’ initiatives and projects to use Killearn Glen for monitoring and data collection purposes which will assist with the development of biological recording systems and data collection within the site.

Although grazing within the woodland at present appears to be limited to roe deer and rabbits, there is still a lack of natural regeneration. The boundaries, particularly the northern and western boundaries are in poor repair. Replacement of the fences is proposed during 2016 but works will be required to the southern boundary wall to make it stock/deer proof, including replacement of the field gate and additional fencing where the wall is too low to act as a barrier. Complete exclusion of deer should not be required to encourage higher rates of establishment of natural regeneration although there are opportunities within the woodland to create small fenced enclosures in sparsely wooded areas to assist regeneration if, following boundary repairs, natural regeneration rates are still low. Bracken control and scarification will further assist successful regeneration. Some control of great wood rush where it dominates the ground layer may be necessary for successful natural regeneration.

Lack of resources within the Council for site management means that maintenance works are likely to continue to be undertaken on a reactive basis as situations arise. There is an opportunity for KCFC to explore the options for the

community to assume management of the site either through a time limited lease (licence to occupy) or by outright purchase through, for example the Scottish Land Fund.

On-going monitoring for disease should be a priority for management. Stirring Council staff are trained to recognise disease symptoms and receive regular plant health updates but as staff visits are infrequent, it would be appropriate to recruit local Observatree volunteer(s) to assist with monitoring of the site (see <http://www.observatree.org.uk/>).

Timber production is not an objective of management at Killearn Glen. There are however opportunities for onsite processing of utilisable timber in appropriate circumstances to provide facilities (see for example section 3.1). Woodland management also provides training and education opportunities, some of which are being delivered in the short-term through the Lost Landscapes project by Green Aspirations.

Selective felling to waste is likely to be the most practical form of management in some areas of the woodland which will provide the opportunity to ensure adequate deadwood habitat throughout the site to enhance conditions for invertebrate interests. Consideration should be given to providing more standing and fallen deadwood where this can be done safely. There is an opportunity to produce a deadwood management strategy to ensure a minimum of 20m³ deadwood per hectare (see <http://www.forestry.gov.uk/england-managingdeadwood>).

8.2 Opportunities by Compartment

8.2.1 Compartment 1 (5.0ha)

Compartment 1 is the largest compartment within the woodland and comprises

most of the land lying between the tributaries of Kirkhouse Burn. Opportunities within this compartment include:

- Maintain and upgrade the principal path network;
- Replace fencing on the external boundaries of the site;
- Eradicate any Himalayan balsam in Kirkhouse Burn and monitor the area for any further colonisation;
- Thin existing areas of regeneration in favour of native species and better stems;
- Thin existing woodland to remove sycamore and beech and control regeneration of these species;
- Encourage development of a more diverse and extensive understorey through supplementary planting;
- Control bracken in the glades;
- Monitor compartment for natural regeneration of native species and protect emerging seedlings with tubes to encourage establishment;
- Tidy up windthrow, concentrating on removal of fallen trees over the paths and burns and stack to form deadwood piles where this can be done safely;
- Tidy up area adjacent to eastern boundary by controlling garden escapees and some of the encroaching scrub vegetation and consider replanting with smaller tree species that will not encroach on or shade the adjacent gardens;
- Introduce an appropriate maintenance regime for the ditches that prevents siltation.

8.2.2 Compartment 2 (2.2ha)

Compartment 2 comprises the woodland lying to the south of Kirkhouse Burn extending west almost as far as the field gate in the boundary wall. Opportunities within this compartment include:

- Repair boundary wall and erect a fence along the south eastern part of the boundary where the wall has largely disappeared;

- Control bracken and greater wood rush in open areas and scarify ground to encourage regeneration. Undertake supplementary planting of oak (consideration should be given to creating some temporary fenced enclosures within this compartment to improve chances of successful regeneration and establishment if natural regeneration is not successful following boundary repairs);
- Monitor compartment for natural regeneration of native species and protect emerging seedlings with tubes to encourage establishment;
- Encourage development of a more diverse and extensive understorey through supplementary planting;
- Establish some individual specimen trees along the march boundary to replace those lost but consider an alternative species to beech (e.g. lime).

8.2.3 Compartment 3 (1.7ha)

Compartment 3 comprises the south western part of the site and appears to be the oldest part of the woodland. The majority of the ancient oak coppice stools are found within this compartment. As part of the Lost Landscapes project, some of the features within this compartment are to be researched. This will include a dendrochronological analysis of some of the coppice stools and research into the potential for re-introduction of a coppice regime for the stored coppice. This research will inform decisions on the future management of this compartment. The Lost Landscapes project will also investigate the wet depression in the centre of the compartment to decide whether or not it is a man-made structure and possibly an old curling pond.

Other opportunities within the compartment include:

- Encourage development of a more diverse and extensive understorey through supplementary planting;
- Monitor compartment for natural regeneration of native species and protect emerging seedlings with tubes to encourage establishment;

- Maintain and upgrade the principal path network;
- Manage the beech regeneration on the western edge of the site to create an amenity beech woodland by thinning in favour of better specimens;
- Create a viewpoint near the boundary, possibly with a sculptured bench constructed from the in situ beech timber;
- Remove beech regeneration from the remainder of the compartment;
- Upgrade the stile on the south western boundary and replace the field gate on the southern boundary;
- Repair the southern boundary wall and replace the fence along the western boundary (with vehicular access point);
- Establish some individual specimen trees along the march boundary to replace those lost but consider an alternative species to beech (e.g. lime).

8.2.4 Compartment 4 (0.6ha)

This compartment occupies the north western part of the woodland. The compartment slopes steeply down to the burn from the north western boundary with the sledging/cow field to Kirkhouse Burn. Opportunities for management here include:

- Remove windthrown trees along the northern boundary and undertake remedial works to any remaining trees that require them;
- Replace fencing on the external boundaries of the site;
- Control sycamore regeneration.

8.2.5 Compartment 5 (1.3ha)

Most of the remaining features associated with the designed landscape of the Place of Killearn are found within compartment 5 and the conservation and enhancement of these features as well interpretation of them should be the principal objectives of management of this compartment. The Lost Landscapes project will help to identify management opportunities and inform and prioritise management actions. These may include the following:

- Remove sycamore (approximately 20no. trees) stand lying between the path and the burn to the east of Ladies Linn and undertake replacement planting with species that were planted as part of the designed landscape (e.g. see Section 2.4) to restore the ‘sense of place’ that the designed landscape sought to create;
- Remove the regeneration along the burn sides to the west of Ladies Linn to re-create the views that once existed of Ladies Linn from the bridge and consider replacement of the bridge (in consultation with Stirling Council’s Archaeologist);
- Remove any trees that are damaging the retaining walls of the canalised section of the burn;
- Remove all windthrow affecting the haha/tearoom walls as well as those growing on top of the walls to prevent further damage;
- Repair/consolidate the remaining haha and tearoom walls and the steps to prevent further deterioration ;
- Consider approaching the Gordon Trust to restore features that straddle the ownership boundary, particularly the trees;
- Install a bench and interpretation board describing the development of the site and its cultural and natural history, including information on the ‘hollow ways’, the designed landscape and the development and management of the woodland;
- Upgrade and define the formal path network, including a link from the core path to Ladies Linn that can be identified as a formal path to reduce compaction and trampling within the root zones of the yew trees;
- Manage the remaining yew trees to ensure longevity;
- There is an opportunity to collect seed from the existing larch stand and have it grown on in a local nursery to provide replacement larch for planting within the compartment to maintain and perpetuate this feature of the woodland;
- Maintain and upgrade the principal path network;

- Replace fencing on the external boundaries of the site and incorporate a gate or stile above Ladies Linn to allow continued public access.

8.2.6 Compartment 6 (1.1ha)

This compartment comprises the central area of the woodland where several paths converge. There are stands of mature Norway spruce and Scots pine with some particularly attractive specimen trees. The spruce and pine are an important component of site and contribute to the character of the wider area. Previous felling/thinning has resulted in extensive regeneration throughout the compartment over recent years but this has not been managed. The ‘hollow ways’ in this compartment are to be further researched as part of the Lost Landscapes project which will inform their future management. Opportunities for management within this compartment include:

- Thin broadleaved natural regeneration in favour of native species;
- Thin around established oak regeneration to encourage the development of windfirm trees;
- Undertake enrichment planting with oak and understorey species, particularly holly and hazel;
- Plant specimen conifers where planting coupes are created through thinning to perpetuate the character of the site;
- Maintain and upgrade the principal path network ensuring that the ‘hollow ways’ are being appropriately used and managed.

9. Management Prescriptions, Proposals and Recommendations:

The management proposals and recommendations have been informed by the information in sections 7 and 8. Priorities for management in each zone are summarised on Maps 4a and 4b.

9.1 Site-Wide

- Manage Killearn Glen under a low impact silvicultural system to enhance its biodiversity interests to ensure that it contributes to meeting UK and Stirling BAP priority habitat targets for lowland mixed deciduous woodland (see <http://www.snh.gov.uk/docs/A1509047.pdf>);
- Control beech and sycamore regeneration by thinning in favour of native species and encourage establishment of beech only in appropriate areas (see recommendations for compartments below);
- Undertake enrichment planting, particularly of understorey species and specimen conifers as appropriate (see compartment recommendations below);
- Repair/replace boundary fencing and walls to ensure that the site is stock-proof (repair 25m of post and wire fence along Beech Drive; replace 604m of post and wire (pignet) fencing along the northern and western boundaries; install water-gates where Kirkhouse Burn leaves/enters; install a new field gate in the western boundary to allow vehicular access to the woodland and install a gate/stile above Ladies Linn to allow continued pedestrian access; repair approximately 40m of drystone wall along the southern boundary and install one new field gate and one stile) ;
- Undertake enrichment planting of native canopy species where appropriate (see compartment recommendations below);
- In consultation with the Killearn Paths Group select a formal path network to include the existing core paths as well as paths to features of interest (e.g. Ladies Linn);
- Upgrade the chosen formal path network so that its wearing surface is fit for purpose and accessible to a wide range of users. 2013m of path is shown as requiring upgrading on Map 4a, including the core path network, the path to Ladies Linn and a link path in compartment 3 but a more

- extensive formal path network may be considered more appropriate by the Community);
- Explore the potential for an all-abilities circular route through the Glen with the Killearn Paths Group and appropriate advisory bodies such as Paths for All Partnership (<http://www.pathsforall.org.uk/pfa-home>), Fieldfare Trust (http://www.fieldfare.org.uk/?page_id=17) etc.;
 - Explore the feasibility of creating a formal link from Killearn Glen to the West Highland Way ;
 - Implement the Stirling Tree Operational Risk Management Strategy (STORMS) to ensure on-going monitoring and regular maintenance of trees within falling distance of paths and boundaries;
 - Monitor tree health within the woodland and engage the help of Observatree volunteers. If there are no existing local Observatree volunteers encourage local participation in the initiative (<http://www.observatree.org.uk/>) to assist with the early identification of disease and encourage local residents to access training resources;
 - Promote responsible disposal of garden arisings with neighbouring householders to avoid further colonisation of unwanted species within the site and remind neighbours of their duty to dispose of garden waste responsibly under the provisions of Wildlife and Natural Environment (Scotland) Act 2011 i.e. that irresponsible tipping is an offence (see <http://www.gov.scot/Publications/2012/08/7367/0> for Scottish Government Code of Practice);
 - Produce a deadwood management strategy to ensure a minimum of 20m³ deadwood per hectare <http://www.forestry.gov.uk/england-managingdeadwood>;
 - Make safe any standing dead trees where possible and manage as standing deadwood habitat;
 - Manage the site to improve conditions for associated species, for example, by erecting bird and bat boxes in discrete locations away from footpaths;

- Establish and maintain a system of biological recording (see <http://www.brisc.org.uk/>) and engage with established volunteering schemes and citizen science initiatives to assist with recording and monitoring (see for example, Woodland Trust's Ancient Tree Hunt (see <http://www.ancient-tree-hunt.org.uk/>), National Bat Monitoring Programme (<http://www.bats.org.uk/pages/nbmp.html>) run by the Bat Conservation Trust, bird monitoring through BTO (<http://www.bto.org/volunteer-surveys/birdtrack/about>) and local ornithological groups such as the RSPB's Forth Valley Local Group (<http://www.rspb.org.uk/groups/forthvalley>);
- Monitor extent of herbivore damage within the site following boundary repairs and consider introducing a programme of control if necessary in accordance with good practice (see [http://www.forestry.gov.uk/website/publications.nsf/\\$\\$search](http://www.forestry.gov.uk/website/publications.nsf/$$search) for published advice);
- Following the completion of Rediscovering the Community's Lost Landscape project review the existing interpretation in Killearn Glen and develop an interpretation strategy that explains the cultural and natural heritage of the site and provides access to information through a variety of media;
- Explore the opportunities for providing an on-going community led programme of events and woodland skills training that uses Killearn Glen;
- Explore the options for the community to assume management of the site either through a time limited lease (licence to occupy) or by outright purchase through, for example the Scottish Land Fund.

9.2 Compartments (Refer to Maps 4a and 4b: Killearn Glen - Proposals)

9.2.1 Compartment 1

- Eradicate Himalayan balsam from Kirkhouse Burn and monitor the site to

- ensure it does not re-establish;
- Control garden escapees that are likely to colonise the woodland and suppress the native ground flora from the area between core path number 9078Ki/33 and the boundaries of the adjacent gardens (0.3ha);
- Remove all windthrown and partially windthrown trees from watercourses and footpaths;
- Control bracken in glades (0.4ha);
- Scarify ground following bracken control to encourage natural regeneration;
- Monitor compartment for natural regeneration every spring and protect any emerging seedlings with tubes (native species only);
- Thin areas of pole stage and established regeneration in favour of native species and better specimens (0.4ha);
- Thin compartment to remove established sycamore and beech regeneration and hand-pull emerging seedlings;
- Maintain ditches to prevent siltation and inspect regularly;
- Under-plant mature woodland area with understorey species (hazel, holly with elder and hawthorn near the woodland edges) planted in 15no. single species groups of 5 plants planted at approximately 1.5m spacing's, staked and protected with shrub guards;
- Replace boundary post and wire fence along Beech Drive;
- Remove existing fences along the northern boundary and replace with post and wire (pignet) fence (see site wide recommendations above);
- Upgrade path network (see site wide recommendations above).

9.2.2 Compartment 2

- Control bracken in open areas (0.6ha);
- Scarify ground following bracken control to encourage natural regeneration;

- Monitor compartment for natural regeneration every spring and protect any emerging seedlings with tubes (native species only);
- Plant approximately 10 groups of holly, hazel and hawthorn in single species groups of 5 plants at approximately 1.5m spacing's, staked and protected with shrub guards;
- Thin mature woodland in favour of oak;
- Make safe over-mature and partially windthrown trees and manage as standing and fallen deadwood;
- Repair breaches in southern boundary wall;
- Establish 5no. well-spaced specimen trees (e.g. lime) adjacent to the march boundary to re-establish this feature of the site.

9.2.3 *Compartment 3*

The Rediscovering the Community’s Lost Landscape project will inform decisions about the re-introduction of a coppice regime for the site.

- Remove all windthrown and partially windthrown trees from watercourses and footpaths;
- Plant approximately 10 groups of holly, hazel and hawthorn in single species groups of 5 plants at approximately 1.5m spacing's, staked and protected with shrub guards;
- Upgrade path network (see site wide recommendations above);
- Manage the western edge of the compartment as a developing beech woodland with amenity as the principal objective of management by thinning beech regeneration;
- Create a bench or sculptured feature from beech timber on the site;
- Erect an information/interpretation board (small) on the western boundary near the stile;
- Replace the wooden stile on the south western boundary;
- Replace the existing field gate on the southern boundary;

- Repair breaches in southern boundary wall (see site-wide recommendations);
- Replace post and wire (pignet) fence along western boundary and install a field gate;
- Establish 4no. well-spaced specimen trees (e.g. lime) adjacent to the march boundary to re-establish this feature of the site.

9.2.4 Compartment 4

- Remove all windthrown trees along the northern boundary of the compartment/site and undertake any necessary remedial works to the remaining trees to make safe;
- Remove existing boundary fences and replace with post and wire (pignet) fence (see site-wide recommendations);
- Thin to remove sycamore regeneration.

9.2.5 Compartment 5

The Rediscovering the Community's Lost Landscapes project will help to identify management opportunities and inform and prioritise management actions. These may include the following;

- Remove the sycamore stand lying between the path and the burn to the east of Ladies Linn and undertake replacement planting with species that were planted as part of the designed landscape (e.g. see Section 2.4);
- Remove the regeneration along the burn sides to the west of Ladies Linn to restore views;
- Replace the bridge;
- Remove any trees that are damaging the retaining walls of the canalised section of the burn;
- Remove all windthrown trees affecting the haha/tearoom walls as well as those growing on top of the walls to prevent further damage;

- Repair/consolidate the remaining haha and tearoom walls and the steps to prevent further deterioration;
- Approach the Gordon Trust about protection/restoration of those features that straddle the ownership boundary, particularly the trees;
- Install a bench and interpretation board adjacent to the path above Ladies Linn;
- Upgrade the path network and define a route from the core path to Ladies Linn;
- Mulch the root zones of the remaining yew trees;
- Collect seed from the remaining stand of larch and have it grown on to provide replacement trees for the site for the future;
- Replace fencing on the external boundaries of the site (see site-wide recommendations).

9.2.6 Compartment 6

- Thin broadleaved natural regeneration to remove sycamore and beech;
- Halo thin around established oak regeneration to encourage the development of windfirm trees;
- Plant approximately 10 groups of holly and hazel in single species groups of 5 plants at approximately 1.5m spacing's, staked and protected with shrub guards;
- and understorey species, particularly holly and hazel;
- Plant specimen conifers where planting coupes are created through thinning to perpetuate the character of the site;
- Maintain and upgrade the principal path network ensuring that the Stirling Council Archaeologist is consulted on the use and management of the ‘hollow ways’.

10. Delivery of National and Local Targets:

National Targets

Delivery of Scottish Forestry Strategy

Delivery of 2020 Challenge for Scotland's Biodiversity

Delivery of UK BAP priority habitat targets for lowland mixed deciduous woodland

Local Targets

Delivery of the Stirling and Clackmannanshire Forestry and Woodland Strategy

Delivery of Stirling Councils City Woodland Initiative: A Strategy for Stirling's Urban Woodland Resource

SC BAP targets for lowland mixed deciduous woodland

11. Funding Opportunities:

Scottish Forestry Grant Scheme

(<https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/forestry-grant-scheme/>)

CSGN Community Projects Fund

(<http://www.centralscotlandgreenetwork.org/resources/funding/csgn-community-projects-fund>)

Scottish Land Fund (<https://www.biglotteryfund.org.uk/scottishlandfund>)

Community Seedcorn Fund (FCS)

(<http://scotland.forestry.gov.uk/images/corporate/pdf/fcs-community-fund-15-16.pdf>)

Paths for all Partnership (<http://www.pathsforall.org.uk/pfa/support/grants-a-funding.html>)

12. Stakeholder Engagement:

The following bodies and individuals have an interest in Killearn Glen and should be consulted prior to any works being undertaken or proposals finalised:

- Stirling Council Trees and Woodlands Officer
 Ranger
 Archaeologist
 Senior Access Officer
 - The Gordon Trust
 - Killearn Community Futures Company, including Killearn Paths Group,
Killearn Woodlands Group, All Killearn Archives etc.
 - Killearn Primary School and local nurseries

13. Monitoring:

No monitoring or recording is currently undertaken at Killearn Glen in relation to either biodiversity or social interests with the exception of ad hoc condition monitoring of paths and trees by the Stirling Council Ranger. There is a need to establish systems of annual survey and monitoring in relation to biological monitoring, visitor use, tree safety, INNS and pests and diseases.

Monitoring of deer and rabbit browsing is also required to determine the effects that this is having on ground flora and natural regeneration.

Monitoring systems should include fixed point photography (annual) and recording of an operations and maintenance diary/schedule.

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[http://www.forestry.gov.uk/PDF/FCMS126.pdf/\\$FILE/FCMS126.pdf](http://www.forestry.gov.uk/PDF/FCMS126.pdf/$FILE/FCMS126.pdf)
12. <http://chalaromap.fera.defra.gov.uk/>
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<http://www.clacksweb.org.uk/environment/forestandwoodlandstrategy/>
14. National Forest Inventory, Forestry Commission Scotland
http://maps.forestry.gov.uk/imf/imf.jsp?site=fcscotland_ext&
15. Historic Scotland Inventory of Battlefields, <http://data.historic-scotland.gov.uk/pls/htmldb/f?p=2500:15:0::::BATTLEFIELD:bannockburn>
16. Forestry Commission Scotland, Chalara Action Plan (2013/4) -
[http://www.forestry.gov.uk/pdf/FCSCHALARAACTIONPLANSOTLAND.pdf/\\$FILE/FCSCHALARAACTIONPLANSOTLAND.pdf](http://www.forestry.gov.uk/pdf/FCSCHALARAACTIONPLANSOTLAND.pdf/$FILE/FCSCHALARAACTIONPLANSOTLAND.pdf))
17. Stirling Biodiversity Action Plan (Draft) 2012-2020 -
<http://www.stirling.gov.uk/documents/temporary-uploads/economy,-planning- and -regulation/proposed-ldp/core-documents/cd80-stirling-council-draft-biodiversity-action-plan.pdf>
18. Balquhidderock Woods SSSI – Site Check Visit Notes 26 August 2014, Caroline Crawford, Operations Officer (February 2015)

APPENDIX 1: HISTORIC MAPS

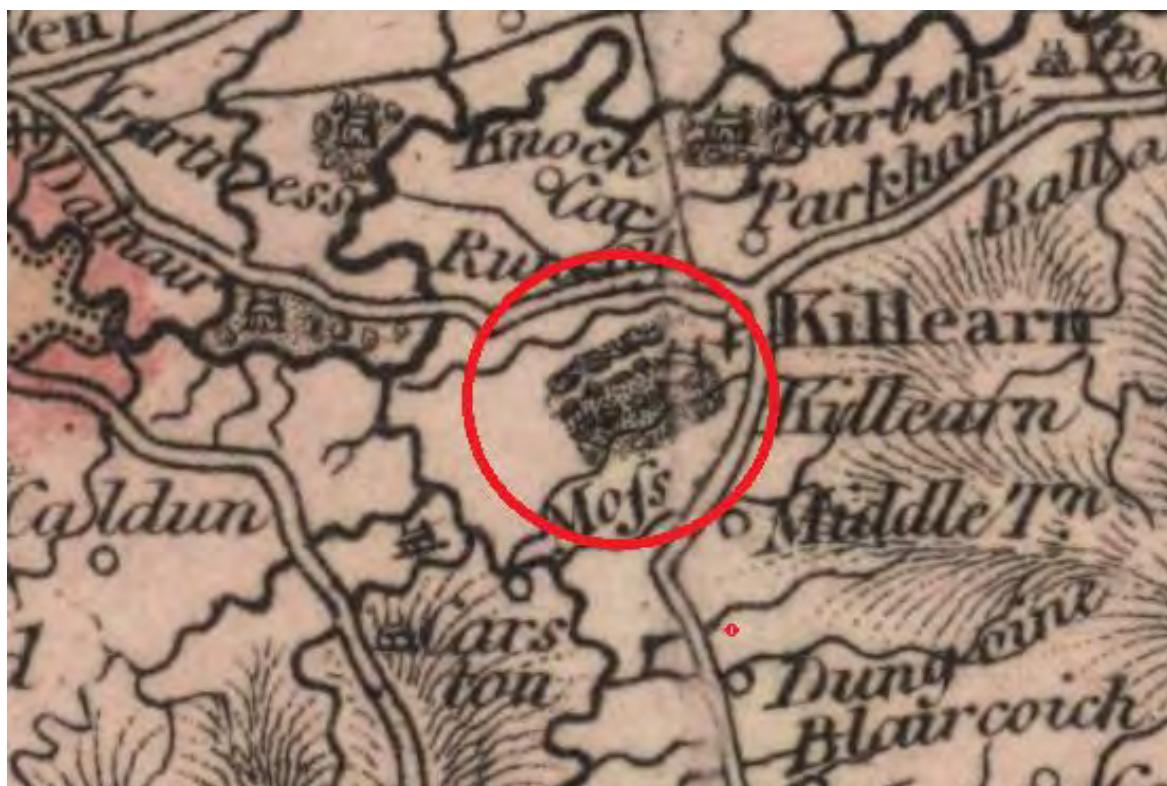


Extract from Roy's Military Map (Lowlands) 1749 – 51

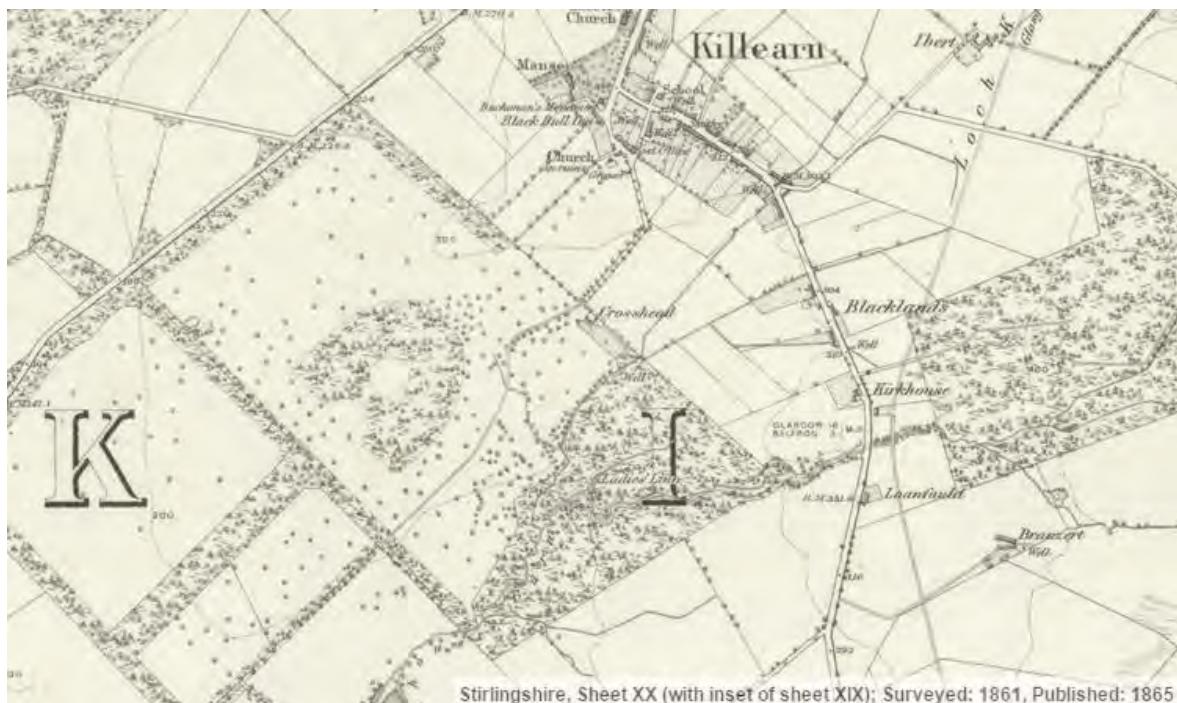
(Source: <http://maps.nls.uk/>)



John Grassom (1817) (Source: <http://maps.nls.uk/>)



Aaron Arrowsmith Map of Scotland 1803



1st Edition OS, Stirlingshire, Sheet XX, Publication Date 1865 (Source:
<http://maps.nls.uk/>)



2nd Edition OS (Revised), Stirlingshire, Sheet XX, Publication Date 1899 (Source:
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