Conservation management at the medieval motte of Moat Park in Cally Woods, Galloway.

Managing the historic environment case study

Introduction

The forests and woodlands of Scotland include an historic environment which needs to be understood and protected for the benefit of all. To meet this objective, the new **UK Forestry Standard** (UKFS) and associated **Forests and Historic Environment Guidelines** (2011) promote the recognition of the historic environment and encourage its protection during forestry operations. The purpose of these case studies are to highlight sources of further guidance that can help forest and woodland managers deliver best practice conservation management over a wide range of archaeological sites and historic landscapes – and showcase the potential that the historic environment can play within Forest Plans.

Guidance to help forest and woodland managers deliver best practice conservation management over a wide range of archaeological sites and historic landscapes.

In 2008 Forestry Commission Scotland published its Policy Statement **Scotland's Woodlands and the Historic Environment**[1]. Its purpose is to:

- Communicate the forestry sector's shared understanding of how forests and woodlands contribute towards Scotland's historic environment.
- Promote the appreciation of the history of Scotland's forests and woodlands, and their contribution towards our cultural heritage.
- Confirm how the forestry sector will endeavour to deliver the required outcomes of Scottish Ministers' strategic policies for the historic environment.
- Outline what practical measures the forestry sector can take to ensure that all our activities enhance the stewardship of the historic environment.

To contribute towards the realisation of the Policy Statement, Forestry Commission Scotland has over recent years delivered key information, advice and guidance projects on the historic environment.

Practice guide

Published in 2010, the Forestry Commission Scotland Practice Guide **Identifying the Historic Environment in Scotland's Forests and Woodlands**[2] was prepared by a small team of professional archaeologists to enable those active in managing woodlands to investigate, identify and record all aspects of the historic environment. Fully illustrated and written in 'plain English' it describes the simple steps that can be taken to identify and record archaeological sites and historic features.

The main objective of the Practice Guide was to raise awareness. It has been designed to help forest managers and workers recognise when archaeology is an issue and trigger the protection measures that are required as part of sustainable forest management.

Information and advice

Now in its second edition, the online Forestry Commission Scotland directory **Historic Environment Information & Advice for Forest and Woodland Managers in Scotland**[3] was published in 2011. This is an essential and comprehensive guide to the resources available to forest and woodland managers relating to the historic environment of Scotland.

The directory has been designed as a routemap to the most pertinent available information and advice to help the preparation of management plans that foster the effective stewardship of all aspects of the historic environment.

Further examples of significant archaeological sites (and their measured survey for a range of objectives) can be found in this Forestry Commission Scotland publication.
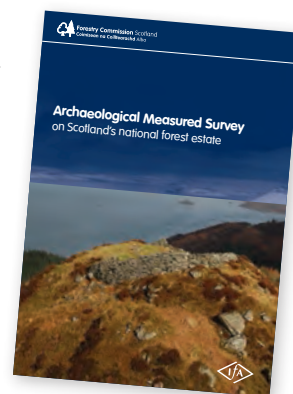
Case studies

These case studies highlight and promote best-practice historic environment conservation management in Scotland's forests and woodlands. They are also the foundation of a one day course in historic environment conservation management.

- **Respecting ramparts: the conservation of hillforts and duns** describes the best practice management of one of Scotland's most significant and visible monument types.
- **Caring for designed landscapes: Cally Woods in Galloway** describes historic landscape conservation management both with community input and set within the Forestry Commission Scotland Forest Design Plan.
- **Historic woodland survey at Loch Katrine** explains the methodology of the survey. It also highlights how a multi-disciplinary approach can provide a holistic

1, 2 & 3. www.forestry.gov.uk/histenvpolicy

overview of past woodland management and how this can enhance and inform contemporary management.

- **Historic woodland survey at Balgownie Wood** highlights the detailed results and practical application of a site-specific survey. It demonstrates how the clues within the woodland and historical sources enable discussion of past woodland structure, identifying significant surviving features and allowing prioritised conservation management.

- **Archaeological survey and woodland establishment on Ulva** describes best practice archaeological evaluation to inform a Forest Plan. It shows how the predictive and protective archaeological survey and record of the historic environment enabled significant archaeology to be protected and features of lesser importance to be incorporated within the planting scheme.

- **The Historic Battlefield of Glen Shiel** describes landscape conservation management for this new heritage designation during the preparation of an Forestry Commission Scotland Forest Design Plan.

The well-preserved earthen mound of the 12th century motte of Moat Park is set within the policies of Cally House, near Gatehouse of Fleet in Galloway. It is an impressive early medieval earthwork, set within popular local woods. Extensive tree clearance and scrub control have opened up the site and reduced the risk of damage by tree throw. The steep slopes, ditch and counterscarp bank of Moat Park motte are now readily visible. Trees on the motte were felled in sequence, with those on the slopes being felled onto protective stacks that had been felled earlier.

Archaeological measured survey in advance of the conservation management works provided a complete baseline record. In this illustration, the plot of the results of an associated magnetometry survey has been draped over a colour digital terrain model of the motte. The magnetometry survey identified subsurface magnetic anomalies that likely represent a significant episode of burning – perhaps the destruction of a timber superstructure on the summit of the motte by fire.

www.forestry.gov.uk/histenvpolicy
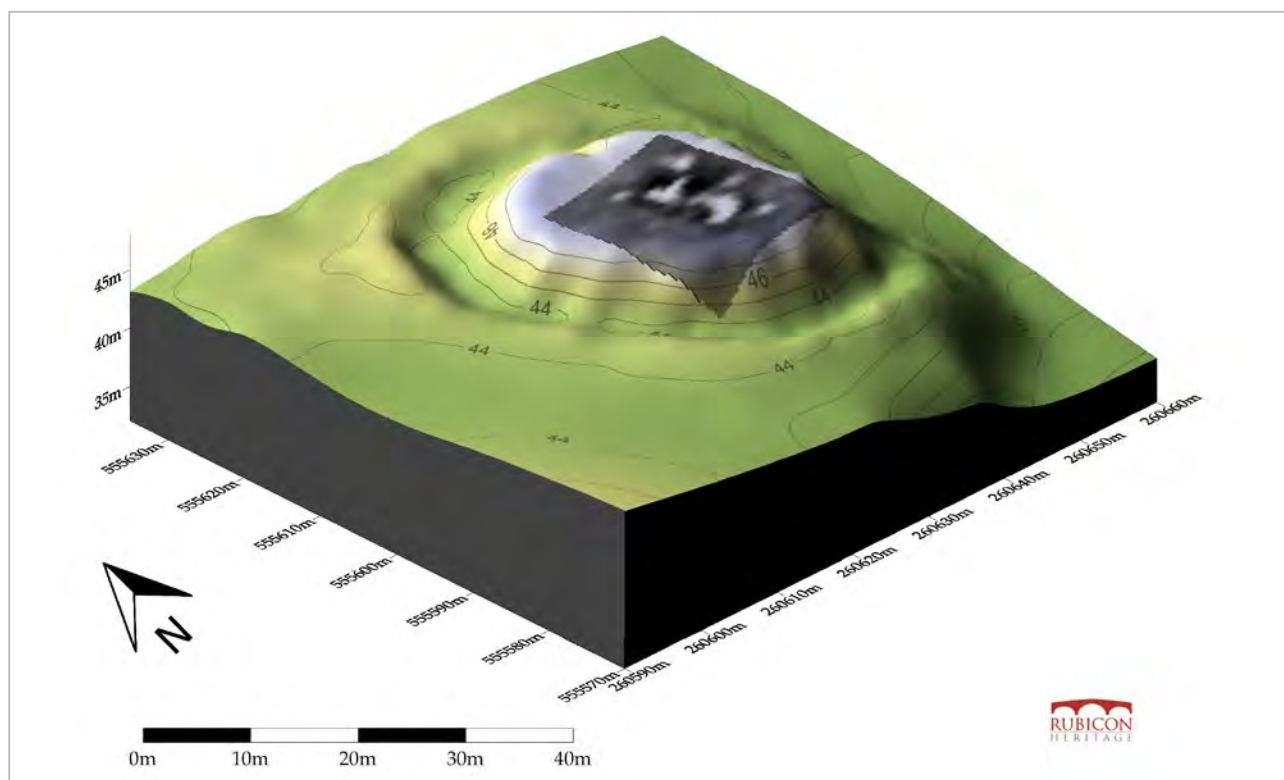
Training

The one day course in historic environment conservation management is intended to promote best practice in the identification, protection and management of the historic environment within and around the woodland environment. The new training course has been developed primarily for woodland managers. It has been designed to:

- Complement the UKFS and Guidelines (specifically the Forests and the Historic Environment Guideline) and associated guidance and information described above.
- Provide a coherent explanation of the spectrum of historic environment issues to be found in Scotland's forests and woodlands and other land that may be considered for future afforestation (presented as regional zones: Highland, Lowland, West Coast and Scottish Borders).
- Describe how relevant information on historic environment sensitivities and issues can be best obtained and interpreted.
- Describe how significant historic environment sensitivities can be best incorporated in an holistic management plan (such as a Forest Plan) for their effective stewardship.
- Describe a range of recognised conservation management techniques for significant sites (with examples) and potential mechanisms of financial support.

Strategic Forest Plans

A **Forest Plan** (and the equivalent Forest Design Plan on the national forest estate) is a strategic plan that describes the major forest operations over a 20 year period. It brings together the management objectives, silvicultural prescriptions, environmental (of which the historic environment is one), social and landscape factors into a comprehensive plan that aims to deliver long-term benefits through sustainable forest management. Grants to prepare a Forest Plan are available to woodland managers through an application to the **Scotland Rural Development Programme** (SRDP).

Forestry Commission Scotland has produced **Strategic Forest Plans – Applicant's Guidance**[4] that describes the basic requirements of a Forest Plan. The process of preparing an holistic Forest Plan includes obtaining, analysing and incorporating the effective management of all aspects of the historic environment over the period of the plan.

4. www.forestry.gov.uk/wighelp

For further information please contact

Forestry Commission Scotland
Forest Enterprise Scotland Head Office
1 Highlander Way
Inverness, IV2 7GB

Tel: 01463 232811
Fax: 0131 316 6152
E-mail: matthew.ritchie@forestry.gsi.gov.uk
Web: www.forestry.gov.uk/scotland

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Bessie's Hill, Dumfriesshire

Managing the historic environment case study

Respecting ramparts:
the conservation of hillforts and duns

The later prehistoric peoples of Scotland have left various indelible marks on the landscape, the most impressive being the forts and duns on our hill tops and craggy promontories. These were built at various times during the period c. 1000 BC and AD 800 as visual statements of tribal belonging and land ownership, as well as for defence. They would have been clearly visible to all from miles around. Some are huge, with their ramparts and ditches enclosing large areas. Others are much smaller but no less impressive.....

Castle Dounie, Knapdale

Exploring several examples of best-practice archaeological protection, conservation and presentation.

Significance

Hillforts and duns provide an immediate link with the past, whether viewed from afar or close-to. They are immediately understandable, with their obvious remains reflecting a basic human need for protection as well as to demonstrate power. Some are associated with folklore or specific early historic kings; a number have been used as foci for art and writing. Their settings are of great landscape value; they are landmark features visible from a distance. Many are protected by law as nationally important scheduled monuments.

Best practice

All archaeological sites in woods and forests need to be protected from damage by trees, felling practices, extraction methods, the routing of tracks and sitting of borrow pits. Best practice also calls for them to be kept clear of scrub and naturally regenerating trees, a major issue for many land managers.

Defended settlements also have other important characteristics. They are places where the setting is of exceptional importance. They should be visible from certain viewpoints as well as having their own areas of sight. How this is accomplished within a commercial plantation can be a challenge. In addition, forts and duns are a major attraction to walkers and bikers. Whether to provide paths or subtly control desire-lines for access needs thought, preparation and careful implementation.

An existing or new Forest Design Plan should contain archaeological survey data and highlight sites of significance. Information is also available online (see Historic Environment Information and Advice for Scotland's Forest and Woodland Managers). How to use these details to best manage the site and enhance the forest and its environment can seem a little daunting at first. But there are many instances where forts or duns have become an integral part of the forest design.

Castle Dounie

Castle Dounie is a classic example of a dun – a small stone-built stronghold occupying a prominent rocky knoll, clearly intended as much to impress as to defend. The Monument Management Plan outlined proposals to re-route the informal access path to enter via the original entrance (a more appropriate and less damaging approach). A full archaeological record was required, alongside a watching brief during path works. A measured archaeological survey provided a series of detailed and annotated measured plans and elevations; an archaeological evaluation was undertaken of the entrance and watching brief during path works; and specialist path construction was commissioned to create a robust and durable path in keeping with the character of the site.

The vitrified ramparts of Dun Deardail in Glen Nevis were recently the subject of path repair and realignment. The old tracks can clearly be seen running up the knoll and over the ramparts, while the new track bends around the contour and uses the original entrance of the fort.
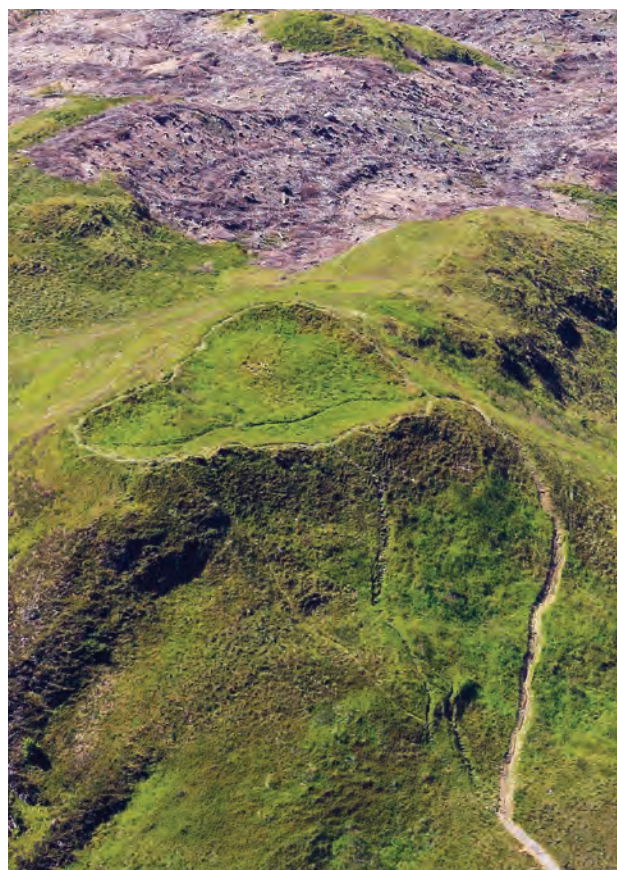
Archaeological measured survey in advance of path works.
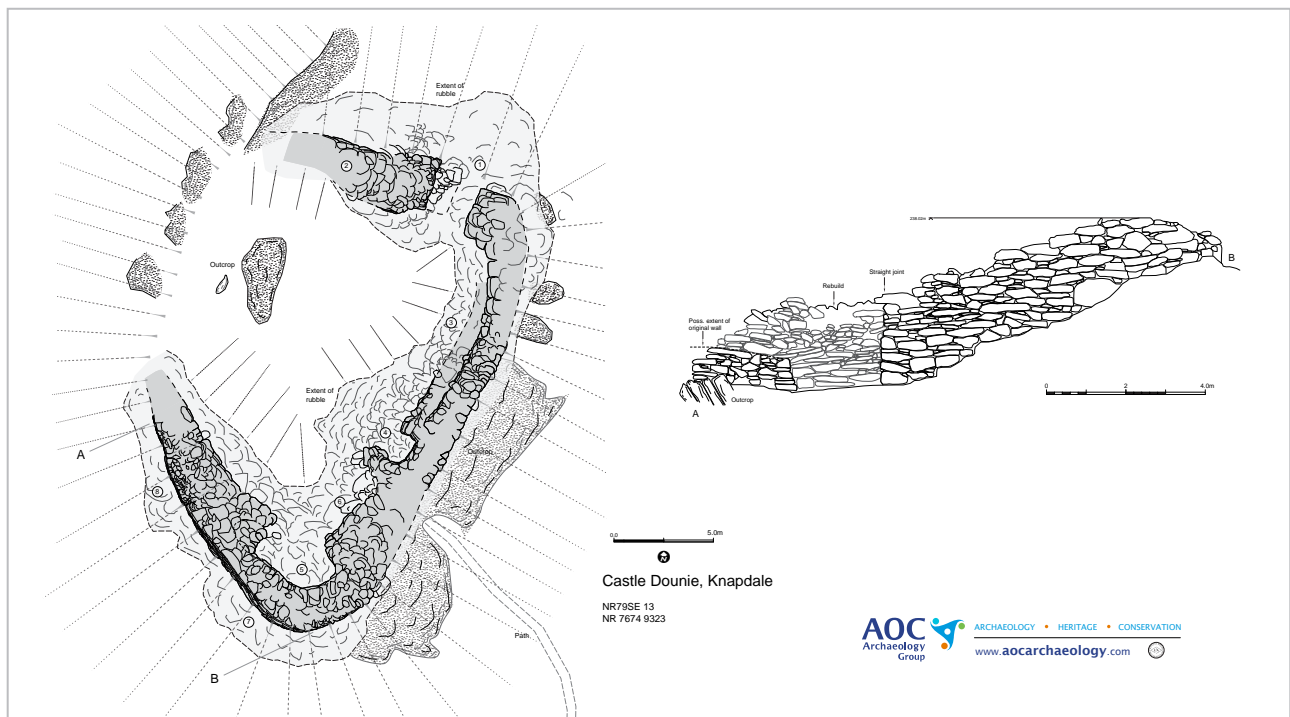
The detailed measured survey has provided an exceptional base line record of this well preserved late prehistoric dun; and the archaeological evaluation recovered both structural evidence and potential dating evidence. The evaluation primarily involved removing the vegetation cover from the rubble within and to the immediate N of the entranceway. The rubble within the entranceway was then removed down to the first significant archaeological horizon or to stable rubble. Geotextile material was laid over the exposed entranceway and stabilised with previously stripped vegetation. The removed rubble was stacked to the NE of the entrance and was used in later path construction.

The evaluation confirmed that the original unusually large entranceway had been narrowed by a modification on the W side of the passage. The modification appears to have been undertaken while the dun was occupied, as the lower passage wall of the later modification was sealed by a distinct accumulation of midden-like material. The collected samples and a recovered metal pin or nail may therefore provide dating evidence for the latest occupation of the dun (post excavation analysis is in progress). The evaluation

The entrance following evaluation and path works. The approach is now well-defined and extremely durable. The natural stone steps are in keeping with the aesthetic historic character of the site.

The old informal route (left, running straight ahead) and new access route. Visitors are now encouraged to follow the new path which ascends the knoll around its east side.

enabled the rubble to be cleared from the entrance while ensuring the protection of stable archaeological and / or structural deposits.

The detailed measured survey, responsive archaeological evaluation and specialist path work has enabled enhanced access provision at a significant prehistoric monument. Each element of the project has been undertaken with considerable skill and expertise; together they have resulted in a project showcasing best practice in regard to access provision at an important upland archaeological site.

Developing proposals

Using an archaeological site plan or aerial photographs, a first step is to visit the place and become familiar with its features, setting and potential or actual views. This will enable practical proposals to be drawn up, perhaps with input from other specialists. If the site is a scheduled monument, any scheme of works will need consent from Historic Scotland in regard to felling or scrub clearance, future management and the development of public access and interpretation of the site. The latter may prove to be a very positive aspect of the works, drawing in funding from a variety of bodies.

Borenich ringfort, Loch Tummel (view facing S). The site is now set in a large clearing of naturally regenerating native woodland.

The modern measured archaeological plan (2012) can be compared to the antiquarian plan (1915).
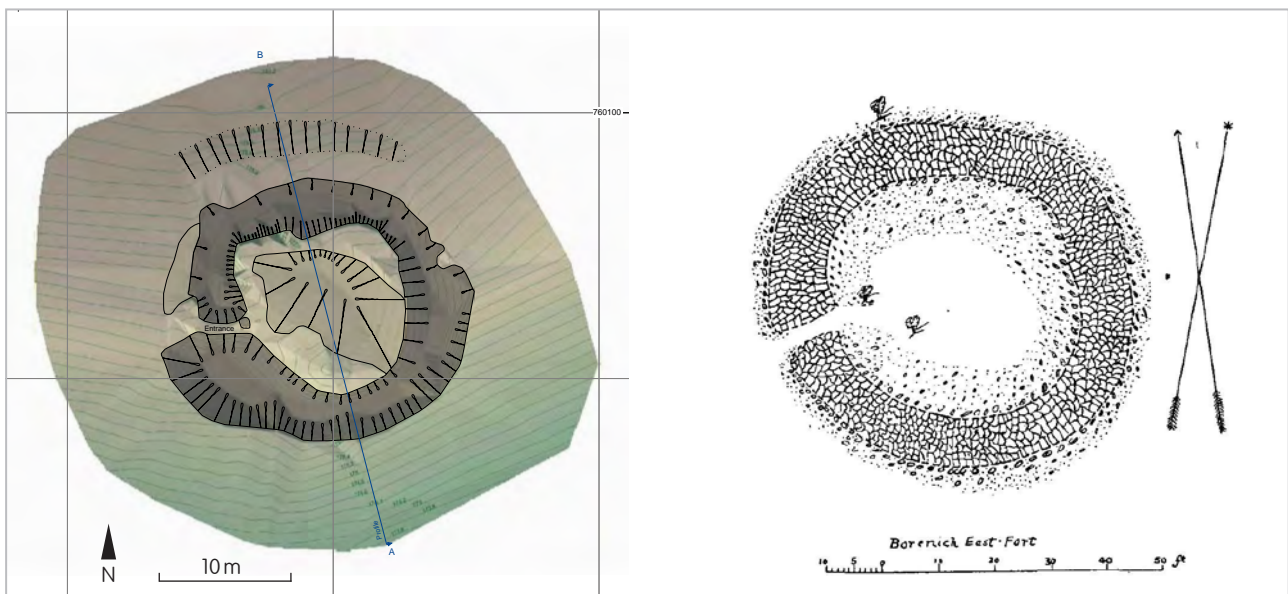
Site clearance

One of the most common needs at these sites is to fell the trees that are growing around the defences, over the ramparts or walls and across the interior, removing the timber without causing damage. Felling by Harvester may not always be appropriate in such instances, or the use of tracked vehicles for extraction. However, there are other techniques that can be used. Flexible soft-felling into a cradle can be used to minimise any possibility of damage, with subsequent removal by Harvester or Forwarder.

Issues associated with wind-throw obviously have to be considered and addressed; such events can harm both upstanding and buried archaeological features. The changes in vegetation that will result from the opening of an area in continuous cover will also need to be managed.

Soft felling on Comar Wood dun

A late prehistoric galleried dun was discovered during pre-felling coupe checks in Comar Wood, Strath Glass, near Cannich in the Scottish Highlands. The dun measures about 21m in overall diameter and is defined by a massive drystone wall. It has several stretches of wall courses visible both externally and internally – and several galleries are visible as depressions within the wall. The thick walls very likely supported a single conical thatched roof. A defensive outwork is visible enclosing the dun, although the SE-facing leading edge of the terrace is defined by steep rock outcrops.

The dun was situated within thinned mature Douglas fir that was planted in 1954 and was due for clear felling. A flexible soft-felling technique was developed in order to fell the firs within the dun but avoid possible structural damage. The trees were felled into a strong rope cradle and slowly lowered to the ground for processing. The cradle was strung between two shackles on slings attached to two spar trees. A counter balance log was attached at one end of the 'arrester rope' which slowed the felled tree(s) safely; the other end was wrapped around the trunk of a nearby tree and 'locked off'.

The spread rubble walls of Comar Wood dun following the felling operation.

The felled tree was then lowered by gradually readjusting the wrapped loose end of the rope and processed at a good working height: where possible, long saw logs were left for later pick-up by Harvester, while in other cases the tree was cut into small pieces and removed by hand. The flexibility of this soft felling method protected the archaeological site, reduced unnecessary climbing and lowering methods for the arborist and shortened time spent on site. The recovery of good timber enabled the cost of the operation to be offset by the sale of timber.

Illustration of soft tree felling.
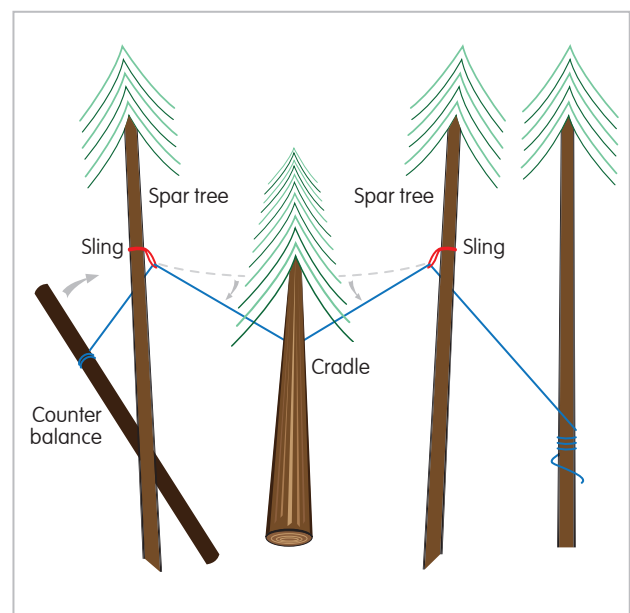
Setting

Having ensured the visibility of the outline and interior of a fort or dun, re-establishing its setting is an important next step. Creating views and sight-lines from a fort to particular features in the surrounding landscape may be one way forward. Such an approach has been adopted at Craig Phadrig, the fort associated by some with St Columba and his visit to King Brude of the Picts and set high above the mouth of the river Ness in the Highlands.

However, whenever possible, best practice calls for the revelation of the site as a whole. Planned restructuring should include sensitive redesign of forest edges around the slopes below hillforts. To be able to see such prominent sites, as well as to have views from them, is one of their fundamental attributes.

Long-term management

Having felled trees and removed timber there is the longer-term management to consider. All too quickly nature can reclaim an archaeological site as its own.

The initial inputs to ensure the protection of a fort or dun have to be followed-up with a regular maintenance programme. If addressed on an annual basis, the expenditure will be extremely small (as a single cutting of invasive vegetation in high summer should be sufficient). But, if left for a decade or so, even well-visited sites become inaccessible and invisible under dense scrub.

It may be possible to introduce grazing over the largest sites, providing a non-intensive means of vegetation control. Issues of access, supplementary feeding, water and fencing must also be considered – and the site should be monitored for signs of erosion. Access paths should also be monitored and (where appropriate) maintained.

Hillforts and duns offer a stunning range of prehistoric and early historic locations for enjoying today's landscapes and beginning to understand past ways of life. Their positive management and promotion by land managers can be achieved alongside the development of economically viable forests.

Although set within extensive woodland, there are impressive views out over the Beauly firth from the ramparts, here framed by selected Scots Pines.

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The restored ha-ha.

Managing the historic environment case study

Caring for designed landscapes: Cally Woods in Galloway

In late-17th and early-18th century Scotland overt display of wealth often led to major architectural changes at castles or even the building of large new mansions. An inherent part of such flamboyance was the creation of formal landscapes consisting of symmetrically laid-out plantings around majestic homes, with tree-lined avenues leading the eye to or from more distant places. Landscape designers soon abandoned the geometry that had been so fashionable and extensive, less-formal grounds were developed. Sinuous lakes, paths and woodlands, clumps of trees in carefully stocked parklands and eye-catching buildings were all created to enhance the natural pastoral lie of the land.

Exploring the background to historic gardens and designed landscapes in Scotland and describing a great example of the conservation of a designed landscape in partnership.

Significance

Scotland's countryside is enriched by designed landscapes and, in the Central Belt in particular, they provide much-valued green space in urban settings. These areas add value to both natural and historic environments as well as providing opportunities for enjoyment, education and economic benefit. Never static, their fragility has been recognised by the creation of an Inventory of Gardens and Designed Landscapes of national significance, organised by Historic Scotland. Others of regional or local importance have been listed by local authorities.

Best practice

Surviving designed landscapes are such complex areas that proposals for their maintenance and managing change require considerable preparation. They need to be based on detailed information-gathering and policy development to ensure that appropriate actions are undertaken. Should plantations be felled, could individual trees or clumps be planted, if so which species would be appropriate, should avenues or vistas be re-created, and might woodlands be developed anew? These are just some of the silvicultural questions that may arise.

But designed landscapes are much more than their trees and woods. What of the paths, artificial watercourses and lakes, follies and ha-has, park enclosures, sunken dykes, gate lodges and walled gardens, to name but a few of their features? Best practice involves the production of a management plan to ensure that all aspects of such areas are considered. Such a way forward is generally the outcome of a partnership between a wide variety of private and public bodies, individuals and communities to ensure a dynamic living landscape that can also be enjoyed by many.

Cally

The designed landscape of Cally is situated immediately south of Gatehouse of Fleet. It lies within the Fleet Valley National Scenic Area (NSA) – and the Cally woodlands and former parks make an important contribution to the landscape quality of the NSA. At the heart of this nationally important Inventory site is Cally House, built in the 1760s, extended at various times thereafter, and now functioning as a hotel. Beyond the hotel and its golf course there are various landowners, including Forestry Commission Scotland, the Cally Gardens plant nursery in the walled garden and Cally Mains Farm. There are also a number of private house-owners, most of whom occupy pre-20th century estate buildings.

Trees and woodlands

Forestry Commission Scotland has managed much of the designed landscape around Cally House since the 1930s. The woodland areas forming the boundaries of the estate were felled and replanted before the Second World War. Most of the grazed parks were also in-filled with forestry, thereby doubling the hectarage under trees. Appropriate deciduous species were chosen and planted with a nurse crop of larch but both are still growing, tall and thin. As was common at this time, the culturally significant features in the policies were generally ignored. No longer in use, the boundary and park dykes, artificial watercourses and bridges, roofless buildings and ha-has were abandoned.

Many of the old parkland trees and clumps in the grounds of Cally House Hotel have also been felled over time, with only a few of the older trees surviving. Although there has been some replanting this has included the introduction of non-parkland species, changing the character of both the avenue and open ground.

Information on designed landscapes

There are over 350 gardens and designed landscapes in the national list (www.historic-scotland.gov.uk/gardens). Information on the history of Cally is available here, along with particulars for all of the others listed. The Inventory also details the various

landscape components that make up each of these varied environments. In addition, advice is provided about management options for such significant areas. FCS has produced guidance on the conservation and management of trees and woodlands in all forms of designed landscapes (FCS Practice Guide 'Conserving and managing trees and woodlands in Scotland's designed landscapes').

There are other sources of information too, including that held in libraries, the National Map Library, private estate offices and the National Archives. Data for non-Inventory sites may also be available from local authority planning departments. All may need to be consulted to ensure an understanding of the form and components of any designed landscape that is to be managed for the future. This was certainly the case for Cally.

Cally's management plan

Although a Forest Design Plan for Cally Woods existed, by 2005 there was enough local interest in the area for a more holistic approach to be taken. A partnership was established and facilitated by the NSA officer. With support from the local authority and FCS, and from SNH who also provided funding, a management plan was commissioned for the designed landscape as a whole.

Research brought together Information on Cally's history and identified each of the elements that made up the designed landscape. Following consultations involving all landowners and representatives of local communities and agencies, a series of management objectives and recommendations were agreed in 2007. They aim to improve the character of Cally while balancing economic needs, conservation and the provision of educational and recreational facilities.

Linked into the Gatehouse Development Initiative, an independent voluntary body, enthusiasm for the various projects is being nurtured, while professional advice is available from some of the stakeholders. The actions are gradually being taken forward as sources of money are identified, along with voluntary input and support in kind like that from the NSA Ranger and FCS Forest District. Individual owners do not have the funds to undertake the work but applications made by the Gatehouse Development Initiative with encouragement from stakeholders are proving very successful.

The double-ditched sunken dyke at Cally: before and after.

© Jim Logan / Anna Johnson

Partnerships for change

Many of the features at Cally are currently masked by forestry. The 12th century motte (a scheduled monument) and the late 18th century folly known as the Temple (a listed building) are just two that will see change over the coming years. With the necessary permissions, trees will be felled, conservation work will be undertaken, access and interpretation will be enhanced. The 19th-century schoolhouse has already been consolidated, following the development of a project plan and successful grant applications.

A project to repair the main boundary dyke around the Cally policies has also been completed. Following the assessment of 17 km of drystane dyking by trained volunteers, an HLF and European grant enabled rebuilding where necessary. This work re-established a strong visual facet of the landscape and is being actively maintained by local agencies.

The Temple at Cally.

The agreed plan also includes a commitment to thin woodlands to open up selected views, as well as to develop tree avenues along the old roads or on the boundary, using appropriate species, such as lime, beech and oak. Thinning of woods is always a sensitive task in designed landscapes, particularly so at Cally where there is so much provision for public access. FCS is now using sensitive methods of harvesting and extraction and are following the principles for continuous cover forestry. Enhancing visual amenity, recreational opportunities, natural and historic conservation are all objectives at Cally Woods.

At the edges of the Cally Palace Hotel grounds and Cally Farm lands the ha-has and their revetments have been cleared of rhododendron and scrub and repaired by professionally supervised volunteers. Fallen timber is regularly being removed from various features and paths. The numerous watercourses, cut in the 1820s to supply the artificial lake in front of Cally House, are yet to be assessed and restored. However, attempts are being made to prevent Cally Lake from silting up further.

Paths, cycleways and horse trails are signed and interpretation is provided at certain points along their routes, funded by several of the stakeholders. This is a well-used designed landscape, for dog-walking, orienteering, and other recreations, valued by locals as well as visitors to the town.

There are various projects still to be undertaken but the 10-year designed landscape management plan for Cally is progressing well. Those actions requiring FCS input are being incorporated into the new Forest Design Plan for 2012–22. But more broadly, the partnerships that have been forged between the various landowners, local communities, agencies, and charitable bodies have been crucial in ensuring that this much-valued landscape will be sustainably managed and maintained for the future.

The restored ha-ha: before and after.

More information

This case study builds on the recent FCS Practice Guide 'Conserving and managing trees and woodlands in Scotland's designed landscapes' – essential information on the effective stewardship of trees and woodlands in a designed landscape. The Practice Guide provides a succinct review of the historic periods of design styles – and the guidance section provides practical information on how all the tree elements can be conserved and managed. The ongoing conservation management and restoration at Cally Woods (undertaken in partnership with the local community and FCS) provides an exceptional case study in the management of historic gardens and designed landscapes in a woodland context – and highlights the importance of a considered management plan.

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

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Landscape with Tourists at Loch Katrine, by John Knox, early 19th century.

Managing the historic environment case study

Historic woodland survey at South Loch Katrine

Loch Katrine's wild natural beauty has attracted visitors for over 200 years. Less apparent to visitors then, as perhaps now, is that much of what appears natural is really a cultural landscape, the product of a long history of working the land and the woods. This case study focuses on recent investigations into the woodland history of Loch Katrine's south east shores around Ben Venue. No-one lives there anymore, but aspects of its more populous past are being revealed through holistic study of the area's remarkable veteran trees and historic woodlands, its archaeological remains, place-names and rich historic documentary evidence.

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Roy Military Survey of Scotland c. 1750.

How a multi-disciplinary approach can provide a holistic overview of past woodland management – and how this methodology can enhance and inform contemporary management.

Significance

Forestry Commission Scotland took a 150 year lease of Loch Katrine's catchment from Scottish Water in 2005, with objectives including conservation of native woodland. Recognising the survival of extensive historic woodland they commissioned a Historic Woodland Survey. This characterised a wide range of wood pastures with possibly worked tree-forms and apparent associations with archaeological remains, raising important questions about wood pasture ages and formation processes which field observations alone could not answer. The subsequent study was therefore designed to encompass tree-forms, dendrochronology (of ash and oak) and historical documentary research, augmented by archaeological, cartographic and place-name evidence.

Best practice

A Historic Woodland Survey is a comprehensive survey that includes historical research and holistic fieldwork (including the detailed record and assessment of individual woodland archaeology and historic trees). A Historic Woodland Evaluation is an informed assessment that includes historical research and holistic fieldwork (but focuses upon discussion and recommendations).

This case study concentrates on the practical application of the Historic Woodland Survey, demonstrating how the clues within the woodland and historical sources enable discussion of past woodland structure, identifying significant surviving features and allowing prioritised conservation management. The practical elements of a multi-disciplinary approach include:

• the study of historical sources (including old maps);
• a study of woodland character and tree-forms; and
• an archaeological walk-over survey.

The methodology of Historic Woodland Survey is explained in the Loch Katrine case study.

Investigating the historical sources

The documentary investigation revealed an interesting history which merits more detailed research. The study area is in Aberfoyle parish, within the earldom of Menteith which originated in the early 12th century. Ben Venue was part of the hunting forest of Menteith, reflected in local place-names like Creag Dhamh (Stag Rock) and Ellrick (Deer-trap). Glasahoile ('Glas' green/grey patch in 'choille' woodland), and some other Gaelic settlement names along south Katrine, are documented from at least the 15th century. While the exact boundaries of the Forest are unknown, it seems likely Glasahoile was a permitted farm within or close to it, practicing mixed farming. Cheese was an important product of 17th century Glasahoile, used in payment of rent. Clearly a balance was sought between the potentially conflicting interests of hunting and grazing. That this was not always achieved is indicated by a 1642 document extracting a promise from Glasahoile's principal tenant not to allow livestock to stray into the earl's forest of 'Bennibennane' (Ben Venue), the penalty being a hefty fine, and a requirement to inform the earl's forester in future.

Coring ash.

© C Mills

In the late 17th century the lands of Menteith were acquired by the marquis of Montrose, at a time when elite hunting became less popular and there was growing commercial pressure to exploit woodland. From this time the estate was managed by chamberlains, mostly local Graham proprietors. Montrose successfully avoided the troubles of the Jacobite risings, in contrast to the Drummond earls of Perth on the north shore who forfeited their estate after the 1945.

Glasahoile ('Glashchyle') was one of several farm townships shown along the south shore on General Roy's mid 18th century map, the earliest known detailed map of the area. However, Roy does not depict every settlement along south Katrine, given that 18th century records include settlements not shown on Roy. Most of these farms were abandoned or amalgamated by the first Ordnance Survey mapping in 1863; Glasahoile was well-established as the principal farm by then and the loch had become the source of Glasgow's water supply. Stobie's wonderful 1783 map of Perthshire shows Glasahoile clearly, now rebuilt, and is the only map to capture a building, albeit un-named, at Murlagan, east of the Bealach nam Bo ('Pass of the Cattle').

Woodland character and tree-forms

The study area's woodlands are diverse in species composition, age and structure. Species include ash, hazel, alder, birch, rowan, crab-apple and oak, while forms include maidens, coppice, natural multi-stems, pollard-forms, air trees and phoenix trees. Although alder and birch are most widespread, their growth forms are very complex, with fused and rotted multi-stems, making dendrochronological analysis from cores alone difficult. Therefore the ensuing research targeted the more amenable ash and oak. The intention was to date tree origins, investigate historic management and address the hypothesis that pollarding had shaped many of the forms.

Extract from 'The counties of Perth and Clackmannan' by James Stobie, 1783, showing Glasahoile, now a single improved farmstead, with the landscape more open to its west; and a building (un-named) at the site identified in this study as Murlagan.

Coring ash on the steep rocky lower slopes of the Bealach nam Bo, under Ben Venue. Results indicate a late 17th century origin.

© C Mills

Ash trees near 'Murlagan' farmstead

An ash of strong pollard form provides tree-ring evidence for cyclical disturbance, best explained by repeated pollarding in the 18th century, in contrast to an undisturbed sequence from a maiden ash of similar age. Dendrochronology indicates a late 17th century origin for these two trees, now the oldest dated ash trees in Scotland. Eighteenth century pollarding ties in with the occupation period of the old farm, tentatively identified as Murlagan based on Montrose rentals and an oral tradition amongst the last generation of local shepherds. Dendrochronology identified a phase of late 18th century ash regeneration which could indicate temporary easing of grazing pressure, perhaps between Murlagan's abandonment and the intensification of sheep farming. There is no tree-ring evidence for pollarding of this younger generation of ash, despite their tree-forms.

Extract from Ordnance Survey 1st edition six inch map Sheet CXIII, surveyed in 1863. Glasahoile, by now the principal farm in the area, has several roofed buildings and a sheep fold. Crantullich, to its east is deserted with several roofless buildings near the shore marked as 'ruins'. The narrow string of Montrose coppice wood hugs the lochshore, from Glasahoile in the west almost to Rubha nam Muc in the east, with lines of tree symbols reflecting coppice enclosure boundaries on the landward side, traces of which survive today.

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The study area on the shores of South Loch Katrine, with locations of sampled trees and archaeological sites (both previously recorded and discovered as a result of walk-over survey).
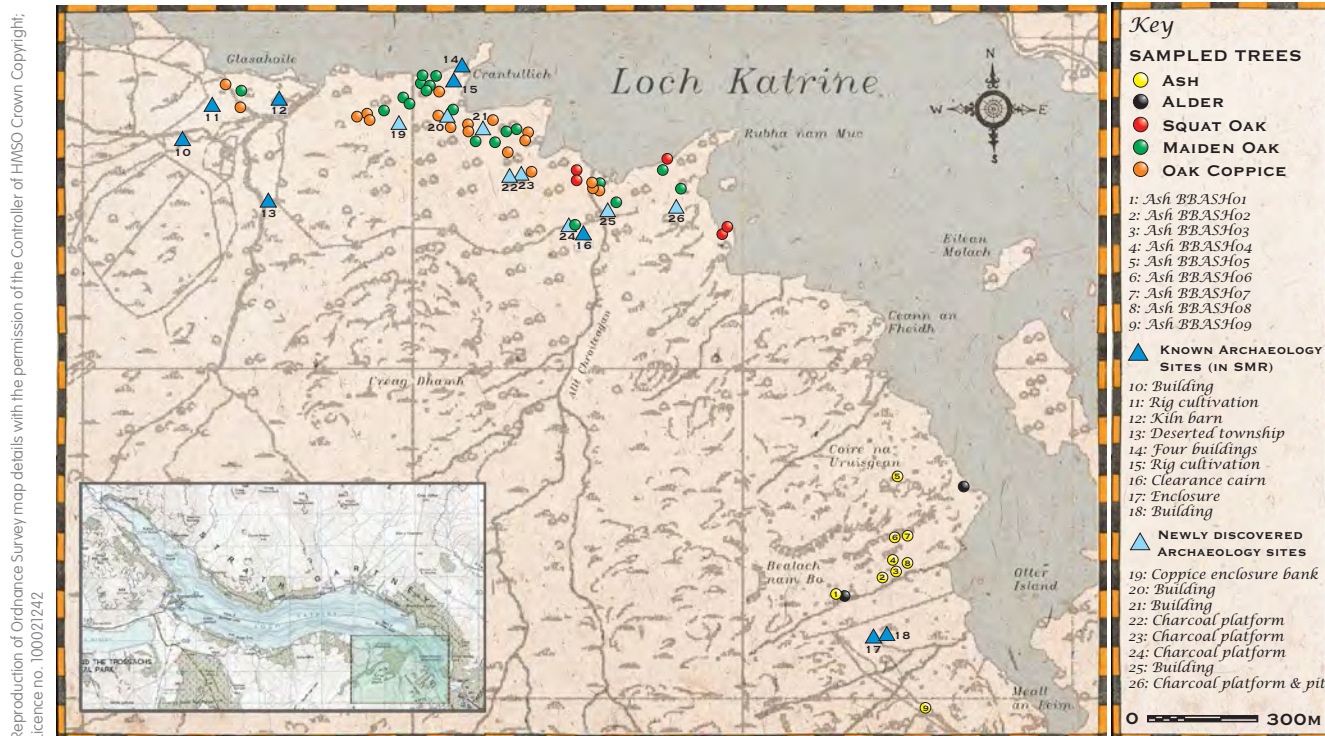
Wood pasture oaks and alder

Cores from wood pasture trees, mostly oaks to the west of Bealach nam Bo, plus a few alder elsewhere, revealed nothing earlier than 19th century dates of origin, and no tree-ring evidence for pollarding. Many of the sampled trees were fused multiple stems with complex formation processes. Initial coppicing and/ or grazing damage could have created multi-stems. Browsing probably continued to influence their form, and trees with low leaning stems would permit access to the canopy by goats, present in the area for many centuries. It became apparent that to understand the squat oaks around Glasahoile better investigation was required of the adjacent old oak coppice, to discover whether they could share a common origin.

Oak coppice: a Montrose legacy

To study the dendrochronology of the Glasahoile oak coppice 61 cores were taken from 36 trees, 18 maidens and 18 coppice-stools. These were analysed and dated to form a site chronology spanning AD

1814–2010. Cores are taken above ground level and miss the first few years of a stem's life, so care was taken to establish best estimates of sprouting dates for maidens and shooting dates for coppice stems. The dendrochronology showed the maidens originated between 1804 and 1884, while the coppiced stools were mostly last cut in the early 1870s.

Mid-late 18th century maps show extensive woodland in this area, and a Montrose record of 1740 identified valuable old oak woodland at Glasahoile. Therefore, despite there being no dendro-dated trees older than 1800, it seems likely that oak woodland existed here beforehand. A Montrose contract of 1718 sold 'barren' (ie non-oak) woods to an Irish merchant, and a 1735 record shows the woods of Glasahoile, Culligart and the Forest were excluded from the Montrose coppice system, which was by now well established across much of the estate. A contract of 1750 to Duncan Stewart for cutting several woods including 'Glaschyle', stipulates enclosure and proper dressing of stools, and may indicate the first systematic oak coppicing in this area. There being no oaks older than 1800 found in the sample at Glasahoile is

interpreted as reflecting intensive 18th century exploitation followed by establishment of an improved coppice-with-standards system in the early 1800s. This probably involved enclosure, selective felling, singling and planting and was undertaken when the Napoleonic Wars led to high prices for home-produced coppice products, tanbark especially, making investment worthwhile even in remote corners of the estate. By this time, a smaller number of farms (including a rebuilt Glasahoile) had succeeded the old mixed farming townships, and oaks were planted on scattered settlement remains around Crantullich, to make the coppice more continuous. Three unrecorded ruins were found within the coppice, and others may survive. The oak coppice would have had peak productivity in the early 19th century, but from the 1830s coppice product prices declined. The coppices here went out of use not long after the 1870s harvest (identified dendrochronologically).

The squat oaks

Glimpses of a once more extensive coppice system are seen in the dates and forms of the stubby wood pasture oaks around the east end of the main coppice stands. The 2009 study showed they have fused multi-stems of 19th century origin and there is no tree-ring evidence of them being pollarded. They are now interpreted as 'fossilised' remnants of 19th century coppice-cutting episodes on the eastern margins which then ceased to be maintained as coppice in a series of stages (from the 1820s or 30s until the 1870s). These squat, fused forms are seen as a consequence of grazing damage to the emerging shoots soon after last being coppiced, perhaps as a result of the eastern edges of the coppice enclosure not being properly maintained. Thereafter they continued to be within open grazed areas.

The Historic Land-use Assessment identified three main historic land-use categories: small areas of medieval to post-medieval settlement and agriculture; areas of 18–20th century managed woodland; and large areas of moorland and rough grazing. A walk-over archaeological survey identified the surviving remains of historic land-use within a broader survey area; sites identified include abandoned farmsteads and field boundaries, shieling grounds and charcoal platforms remaining from woodland industry.

A squat oak on the peripheries of the Glasahoile coppice; dendrochronology indicated they are fused multi-stems of 19th century origin. Their form is interpreted as the consequence of grazing damage after marginal areas of the coppice ceased to be enclosed or managed effectively, as prices for tanbark fell through the 19th century.

© C Mills

Dates of large maiden oaks growing on charcoal platforms suggest the platforms were in use before the 1820s. Platforms higher up the slopes of Creag Dhamh, some in now quite treeless areas, may relate to charcoal-making which pre-dates the current oaks, the distribution of hearths indicating areas of former ancient woodland. This fits well with the 18th century maps' more extensive woodland, and the idea that the early 19th century coppice extended further east than now. It seems likely that the area for charcoal production here was more extensive in the 18th century.

Documents indicate that woodland at Glasahoile was enclosed and coppiced in 1750 and charcoaling seems likely from at least then, if not earlier, perhaps to feed the short-lived Achray furnace in the early 18th century. Only the lower elements of the oak wood, fringing the shore, were consolidated c. 1800 into the 'new' coppice system, when market conditions were right. However, the eastern ends of this system retracted, as prices fell, and the eastern periphery soon became wood pasture. Sheep farming, introduced in the mid-18th century, continued as the main land-use after coppicing ceased in the 1870s. Eventually all remnants of the old oak woods became open to grazing, with only tree-forms and elusive archaeological traces hinting at their prior commercial uses.

A charcoal platform with pit and massive open-grown maiden oak. Dendrochronology showed its size was due to a growth rate 2.5 times faster than average; it originated in the mid 19th century, around 1853.

© P Quelch

Informing contemporary woodland management

Recognising, surveying and evaluating the wood pastures and veteran trees at Katrine have been important steps towards developing a sound basis for future management of the whole catchment. Demonstrating strong links between the historic woods and their associated settlement archaeology has encouraged land managers to regard both types of feature as heritage assets requiring protection and stewardship.

Wood pasture is an intermediate habitat between woodland and open habitats such as heathland or grassland, supporting species from each with some specialities of its own. Exciting improvements in biodiversity are expected as grazing is re-introduced. Researching and trialling old ways of managing wood pastures through livestock grazing and working trees can now be seen as vital to informing sustainable management. The case study has helped us to understand that these ancient wood pastures are in a unique temporal state – the pastoral trees are predominantly in a vulnerable condition, traditional management having lapsed for a considerable period of time and pollarded branches becoming large and susceptible to storm damage. Traditional management will have to be considered in this context with

techniques employed to safeguard and promote the recovery of habitat condition.

The multi-disciplinary study at south-east Katrine shows how a holistic approach is able to obtain a more complete understanding of the wooded landscape's history, with benefits for conservation management and public engagement.

More information

The **Native Woodland Survey of Scotland** (NWSS) can help identify areas of woodland that may benefit from this kind of Historic Woodland Survey. The NWSS is a field-based survey of all of Scotland's native woodlands that aims to identify their location, extent, type and condition. Identified features include areas of coppicing and veteran trees – information that can be used alongside designations such as Plantation on Ancient Woodland sites and identified ancient semi-natural woodland to inform potential priorities for Historic Woodland Survey.

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Extract of the Military Survey of Scotland, 1747–1755, by William Roy.

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Managing the historic environment case study

Historic woodland survey at Balgownie Wood

There is more to Balgownie Wood than immediately meets the eye. At first sight it is just another lowland conifer plantation, but on closer inspection, Balgownie reveals many secrets, with an interesting range of historic trees from various stages of its evolution, often in meaningful locations on historic boundaries within the wood. When drawn together, the historic trees, the archaeological landscape beneath the canopy and the historical documentation reveal an unexpected twist – the story of how a medieval field system became a post-medieval woodland which, albeit much altered, persists to this day.

Detailed extract from Roy map.

How past woodland structure and significant surviving features form a rich natural and cultural heritage resource – that can help understand and prioritise conservation management issues.

The clues within Balgownie Wood

Quite remarkably, a near intact medieval field system, with massive turf banks enclosing extensive areas of broad rig, survives under the 20th century plantation. Broad rig is the product of the heavy mould-board plough introduced by the monasteries in the 12th and 13th Centuries. Balgownie, only two miles north of Culross, was within Culross Abbey's lands, a 13th century Cistercian foundation, and the broad-rig under much of the wood likely originates from these late medieval times, created by the Abbey's tenant farmers.
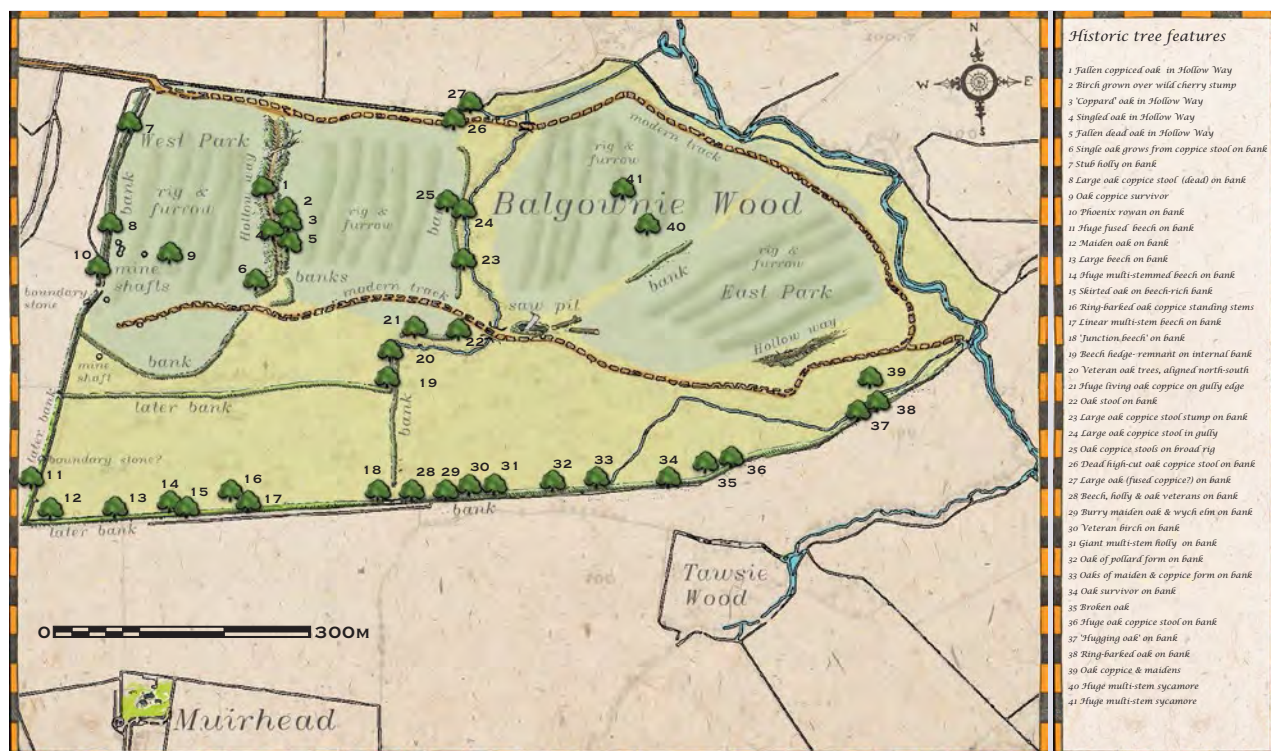
Broad rig was formed by ploughs drawn by teams of oxen or horses, and this system continued in use in Scotland until the Improvement era. However, Balgownie's rig-farming must have ended before the early 17th century (assuming the two 17th century Balgownie wood historical contracts relate to the same Balgownie Wood as today). If so, then valuable trees were present by the first wood contract of 1635 – and woodland must have been established by the late 16th century. The second contract, of 1671, is more clearly about coppice woodland, and it seems likely that oak

predominated; the gap between the two contracts is a workable period for an oak coppice rotation.

An interval between the cessation of rig-farming and the establishment of woodland, with the old fields being grazed, is possible and might explain the names 'Easter Park' and 'Wester Park' for parts of Balgownie Wood in the 1635 contract, given that 'Park' is usually associated with cattle grazing or deer park origins. Alternatively, 'Park' may simply mean 'field' describing the old enclosures. It is possible that the rig system was not entirely treeless; trees may have persisted on field banks, or more correctly 'wood-banks' when the land was being farmed. Such banks could represent a kernel from which a larger wood could be created.

The 16th century seems a likely time for investment in woodland creation. The early industrialisation of the Forth Valley, with salt-pans and coal-mining in great evidence from at least 1500, created a huge demand for raw materials. Meanwhile, Scotland's woodland reserves were in decline; tree-ring evidence shows lowland Scotland was heavily reliant on imported timber from 1450 and all types of woodland resources

The Balgownie Wood study area, with locations of sampled trees and archaeological sites.

Historic tree features

1 Fallen coppiced oak in Hollow Way
2 Birch grown over wild cherry stump
3 'Coppard' oak in Hollow Way
4 Singled oak in Hollow Way
5 Fallen dead oak in Hollow Way
6 Single oak grows from coppice stool on bank
7 Stub holly on bank
8 Large oak coppice stool (dead) on bank
9 Oak coppice survivor
10 Phoenix rowan on bank
11 Huge fused beech on bank
12 Maiden oak on bank
13 Large beech on bank
14 Huge multi-stemmed beech on bank
15 Skirted oak on beech-rich bank
16 Ring-barked oak coppice standing stems
17 Linear multi-stem beech on bank
18 'Junction beech' on bank
19 Beech hedge-remnant on internal bank
20 Veteran oak trees, aligned north-south
21 Huge living oak coppice on gully edge
22 Oak stool on bank
23 Large oak coppice stool stump on bank
24 Large oak coppice stool in gully
25 Oak coppice stools on broad rig
26 Dead high-cut oak coppice stool on bank
27 Large oak (fused coppice?) on bank
28 Beech, holly & oak veterans on bank
29 Burry maiden oak & wych elm on bank
30 Veteran birch on bank
31 Giant multi-stem holly on bank
32 Oak of pollard form on bank
33 Oaks of maiden & coppice form on bank
34 Oak survivor on bank
35 Broken oak
36 Huge oak coppice stool on bank
37 'Hugging oak' on bank
38 Ring-barked oak on bank
39 Oak coppice & maidens
40 Huge multi-stem sycamore
41 Huge multi-stem sycamore

Skirted oak (Tree Feature 15, foreground) on the S bank of the SW enclosure. This feature indicates a past grazing influence. Large beech maiden beyond.

© P Quelch

were under pressure. Parliament passed a series of Acts reflecting increasing concern for the state of the woodlands during the 15th and 16th centuries. An Act of 1503/4 increased penalties on the abuse of surviving woodland 'considering that the wood of Scotland is utterly destroyed'. Furthermore in 1602 Norway cut off its supply of oak to Scotland; this can only have exacerbated the home demand.

The 16th century Abbey lands were managed by a titular abbot, the commendator. From 1531 the Colville family held the Culross commendator-ship. Earliest surviving rentals (1561) show rents paid with the produce of rich agricultural lands, arable and pastoral, with Balgownie one of the lands that contributed. Soon after the reformation, in 1589, the Colvilles were confirmed as superior landowners of Culross-shire by King James VI. However, by 1557, Balgownie was held as a major tenancy by the Erskine family, when James Erskine, lord of Balgownie, was identified in an agreement with a neighbour as having rights to the superior landlord's profits, coal and wood.

The Erskines rapidly expanded their estates through the late 16th and 17th centuries. By 1561 James Erskine had been granted the lands of 'Balgowny and Blarekry' for a rent of £13 16s 8d, and by 1574 were expanding their landholdings around Culross, including acquiring two saltpans. While coal would be the principal fuel, peat and wood might also be used in the saltpans. In 1609 the Erskines acquired Bad with the right to seek coal and in 1617 received the barony of Tulliallan. They also expanded southwards across the Forth and these new lands, together with the lands of Balgownie, were erected into the barony of Balgownie in 1642. The Erskines were actively building up a network of land and industrial interests across the Forth estuary.

The Erskine residence was Balgownie House in Culross, not at Balgownie. A testament of 1604 by Janet Sands, wife of the Balgownie tenant, shows it was by then a single tenant farm, worked by farm labourers, not a multiple-tenancy tounship. Janet's possessions included many livestock, but any woodland would not be listed as it belonged to the landlord. Hence the two 17th century wood cutting contracts for Balgownie are made between John Erskine and the timber merchants directly.

The establishment of Balgownie Wood

This brings us back to the issue of the establishment of Balgownie Wood, which must have replaced the rig in time to mature for those 17th century wood-cutting contracts. It seems likely that Balgownie's rig was transformed into woodland in the 16th century, perhaps around the 1560–1570s in the early Erskine expansionist phase. As astute entrepreneurs they would recognise the value of establishing woodland at a time when supply could not meet demand. Thereafter, the Erskines used Balgownie Wood as a valuable commercial asset repeatedly during the 17th century, as the wood contracts testify, and perhaps into the 18th century. Interestingly, the woods were contracted to timber merchants, not used by the Erskines themselves; this was a cash crop.

It is possible that the few massive oak stools found at Balgownie are survivors from that Erskine period, albeit re-cut in later phases of management. Some veterans on the Hollow Way and older banks could also be from this period. Coring and tree-ring analysis would help to unravel the woodland's chronological development. It is unclear what happened between the 1671 wood contract and Roy's map of c.1750. Remarkably, Roy shows rig symbols 'under' the woodland, a wonderful early depiction of woodland archaeology. Roy's map supports the idea that Balgownie Wood persisted after the 1671 coppicing contract. Roy depicts Balgownie as a loose, apparently un-enclosed wood, in contrast to the rectangular plantations arising all around. Perhaps this old-style coppice was unrecognisable to the surveyors as a managed system. Alternatively, the coppice may have been 'let go' by Roy's survey, either deliberately through grubbing out (as at an Erskine wood at Tulliallan in 1743) or accidentally through grazing damage, and may have evolved into a mix of remnant coppice and colonisers like birch. Some occasional veteran birch could be from this period. No records have yet been found regarding whether the woodland was still managed as coppice during the 18th century.

The Erskines died out around 1767 when Rev. Robert Cuninghame inherited the estate from his uncle, John Erskine. On Stobie's map of 1783 'New Balgownie' farm is established on the new road west of the wood. Balgownie wood is still there, with a similar footprint to Roy, although its character continues to be uncertain; we lack the improvement-era estate maps that are usually so helpful. Our first clue is the Old Statistical Account which in 1791 describes 100 acres of 'natural wood' in Culross parish; given little other natural-looking wood is shown on Roy or Stobie, we assume much of this must be Balgownie. This supports the idea that sometime between 1671 and the late 18th century, the wood ceased to be a managed oak coppice and evolved into a more natural wood. Some of the interesting non-oak veterans, in the hollow way and the main gully, may originate from this time.

After Stobie 1783, map evidence is scant until the mid-19th century first edition Ordnance Survey, but the field evidence indicates that a new enclosure, at the south-west corner of the wood, was created after Stobie's survey; new banks planted with beech, oak and holly hedges planted formed a rectangular extension. This would have been a handsome addition to the improvement field system surrounding the wood and was probably first used as a grazing park, for long enough to create the burry skirt on an oak on its southern bank.

Our next significant clue is the 1834 will of James Cunningham of Balgownie stating that an Alloa wood merchant owed the deceased £337 10s for coppice and other wood extracted from the forest of Balgownie. This helps to date the new oak coppice system evidenced by the ubiquitous small oak stools throughout the wood. Any older (pre-19th century) generation of oak stools was largely erased, except for a few large old stools on banks and in gullies. The received wisdom of 19th century oak coppice management was that stools were only good for a limited number of rotations, and should then be replaced with vigorous young trees.

The Cunninghams probably established their new oak coppice to cash in on the Napoleonic Wars price boom of the early 19th century. By 1834 this new oak coppice system at Balgownie is sufficiently well-established to have been cut. With a preferred rotation in the order of 24 years this implies the coppice was established by approximately 1810. Around this time the interior of the late 18th century south-west beech-hedged enclosure would have been planted up with oak as well as the rest of the wood.

The old banks were not removed; the outer banks continued to serve a useful function, but the internal banks became redundant in the 19th century oak coppice. As portrayed on the 1st edition OS map, the new 19th century layout largely ignored the old divisions and routes, and we find 19th century coppice stools planted on as well as beside old features like internal banks and the hollow way. Those old internal features no longer served any purpose. Mapped for the first time is a sawpit, shown on the 25" 1st edition OS map.

Detail from the 25" OS First Edition 1861 survey showing sawpit.

The hollow way, now overgrown.

Due to mounting debts, in 1863 the barony of Balgownie was disentailed and the estate sold off; the Cunninghams had been borrowing money against the barony lands since the 1790s. After the sale of Balgownie to the Dalgleish family in 1863 we have little documented information because no family papers are known. Rough counts on some oak coppice stems suggest they were last cut in the late 19th century indicating the Dalgleish family continued to manage the coppice. Coal board papers reveal the leasing of mineral rights in the early 20th century; the mine shafts in the wood must date to this period, but have little relevance for the woodland history. The purchase of the wood by the Forestry Commission in 1929 led to the planting of more economically valuable trees, mainly coniferous species; the last major event in the history of Balgownie Wood, until the recent work on PAWS restoration began. The modern plantations emphasise how the history of Balgownie is connected over many centuries by a continuing thread, having been shaped and re-shaped by the economic drivers of the day.

Informing contemporary woodland management

As one of the earlier Forestry Commission plantations, the low-intensity forestry methods allowed a largely intact medieval field system of broad-rig, field banks and hollow ways to survive under the modern plantation. This becomes all the more significant in view of the destructive effects of open cast mining and intensive agriculture in the surrounding landscape.

The Ancient Woodland Inventory has only partially designated Balgownie Wood as Ancient Semi-Natural Woodland – the larger western portion is designated as of Long-Established Plantation Origin. The Historic Woodland Survey of Balgownie Wood has demonstrated that the wood should be considered as one whole and provided a greater understanding of its importance.

Together with the documentary evidence, the surviving historic trees and the archaeological features within the wood form a rich natural and cultural heritage resource, telling the wood's history since the late medieval period and enhancing the potential for native woodland restoration and conservation management.

Managing the historic environment case study

Archaeological survey and woodland establishment on Ulva

Scotland is rich in the remains of past human settlement and activity spanning the past 10,000 years. Archaeological and historic sites contain information which can help us to understand not only how people lived and managed the land, but also how the development of the landscape we know today has been influenced by its previous inhabitants. They are the only sources of evidence for much of Scotland's past and it is important that the sites are recorded and preserved, where possible, for future generations.

How archaeological survey can inform and enable forest and woodland establishment – and how best to use the results.

Significance

The development of a new woodland planting scheme on the island of Ulva, just off the Isle of Mull, provided the opportunity to investigate and record the historic environment in detail and to propose mitigation measures for its future management and preservation. The results from the archaeological survey undertaken in advance of the planting scheme, viewed alongside a desk-based assessment of cartographic and written sources, produced evidence for a wide range of archaeological sites and monuments surviving within an extensive archaeological landscape. The subsequent design for the new woodland planting scheme ensured that the historic environment was taken into consideration and was integrated into the forest planning process.

Best practice

The preparation of open ground for the planting of trees can have a devastating impact on archaeological sites – and the growth and spread of tree roots and scrub can disturb and damage archaeological deposits and undermine above-ground masonry. Established, wind-blown trees can also uproot large volumes of soil, disturbing and destroying archaeological remains. All archaeological sites need to be identified, assessed and protected from these potential impacts – the archaeological survey also then informing the planning of subsequent harvesting, extraction methods, the routing of roads and tracks and the sitting of fence lines. Retaining and enhancing public access to significant archaeological sites should also be considered. This can be achieved by protecting significant remains within open areas of ground. These sites can make a positive contribution to the public's appreciation and enjoyment of woodland and allow for intra-site visibility - although it can require active management to prevent them becoming overgrown.

'Wolf Island'

The island of Ulva (Ulvoy in Norse meaning 'Wolf Island') has a rich and diverse range of archaeological sites and monuments spanning the prehistoric and historic periods. Standing stones and Iron Age duns comprise the visible prehistoric monuments, while excavations at Ulva Cave (also known as Livingston's Cave) produced flint and bone tools and midden material dating to the Mesolithic period.

However, it is the post-medieval settlement remains that dominate the island landscape today, with houses, byres, bothies, shielings, enclosures, boundary dykes and rig and furrow cultivation plots forming a well-preserved relic settlement system.

It has been claimed that the Clan MacQuarrie can trace their roots on the island back to the 9th Century AD, although Lachlan MacQuarrie, the last chief to live on the island, was forced to sell Ulva in 1777 to pay outstanding debts. However, unlike other areas of the Highlands and Islands at this time, this did not signal the start of the clearance of people from the land. Seaweed played an important role in the history of Ulva during

The extensive archaeological landscape on Ulva includes deserted townships and farmsteads and areas of relict rig and furrow cultivation.

this period and in 1785 the island was purchased by a pioneer of the kelp-burning industry. It was his son, Staffa MacDonald, who was reputed to have 'trebled his income and doubled his population by careful attention to his kelp shores'.

In 1835, Francis William Clarke bought Ulva and by 1837 the population had grown to at least 604 people, living in sixteen villages across the island. Unfortunately, Clarke's high hopes for this thriving community were shattered when the kelp market collapsed at the end of the Napoleonic Wars and he was left with a great surplus of tenants. This, combined with the potato blight, resulted in the end of the crofting estate and the clearance of the island followed. At its height, before the collapse of the kelp industry, Ulva had a population of at least 800 people and even had a surplus production of potatoes that were exported from the island.

Development of the project

The woodland creation scheme at Ulva was taken forward using a Woodland Improvement Grant through the Scottish Rural Development Programme (SRDP). On behalf of Ulva Estates, Miller Harris (a forestry consultant) formulated the first draft for a planting scheme on the island based on known archaeological sites and ecological factors. The historic environment

was identified from cartographic sources and from the results of an archaeological assessment and survey of the island undertaken in 1998. The survey produced a database of recovered sites on the island, although this lacked detail relating to individual structures and wider settlement evidence (such as field boundaries and areas of relict cultivation).

Recording the township ruins during the archaeological survey.

Archaeological survey

To protect important sites a range of issues need to be considered, such as providing a protective buffer to exclude new planting and avoid inadvertent impact. On occasion the retention of a group of sites in a larger clearing area may be appropriate. Having accurate survey information is essential during planning – and marking-out surveys may also be needed to confirm the design strategy on the ground.

Evaluating an area deemed to be archaeologically sensitive usually requires a combination of techniques appropriate to the type of landform and potential archaeology that may be encountered. The most commonly used techniques are:

* **Desk-based assessment:** the identification of known or potential historic environment sites through examining existing records.
* **Prospective survey:** survey undertaken to locate and define upstanding historic environment sites. Surveys can take a variety of forms: the targeted inspection and definition of known sites; the prospective survey of ground of high potential to locate previously unidentified sites; and the comprehensive inspection of all ground covered by a proposal.
* **Protective and detailed survey:** survey undertaken to support agreed design solutions such as: a final walkover survey to mark out significant archaeological remains within the proposal and fully check the area identified for planting; or a detailed measured survey to record the landscape prior to planting.

The results from a combination of desk-based assessment and prospective survey will significantly enhance the historic environment record for a study area, providing an excellent evidence base for land management. This enables all future planting design to be integrated with the historic environment, with significant features avoided (or retained in open areas).

Following the identification of the woodland area (using the results of the earlier walkover archaeological survey among other considerations), a second, more detailed archaeological survey was commissioned in order to mark out areas of significance and record the wider archaeological landscape prior to planting.

This approach ensured the protection of significant archaeology (by marking it out) and provided a useful detailed record (the measured plan) for future management use. It ensured protection in situ for significant historic environment features and a measure of preservation by record for landscape features of lesser importance. The measured plan further enhanced the Historic Environment Record and afforded more flexibility in relation to the avoidance (or not) of visible field boundaries and areas of rig and furrow cultivation.

Methodology and results

After undertaking a thorough desk-based assessment (where aerial imagery and cartographic sources covering the survey areas showed significant areas of cultivation and boundary dykes), the walkover survey was completed by two archaeologists using GPS technology with sub-metre accuracy and GIS software on a handheld computer. Archaeological sites were recorded individually and included the use of high-resolution digital photography where possible, while sketch survey drawings were produced of some sites.

The resulting GIS files from the survey data have been used to create detailed plans of the surviving archaeological landscape, while details relating to the individual recovered sites and monuments have been incorporated into a Gazetteer of Archaeological Sites. Stands of bracken are widespread on the island of Ulva, leading to significant visibility issues when identifying archaeological sites on the ground. Therefore, the walkover of the survey areas was undertaken in the spring when ground vegetation was at a minimum, resulting in improved site recovery and maximising coverage of the ground.
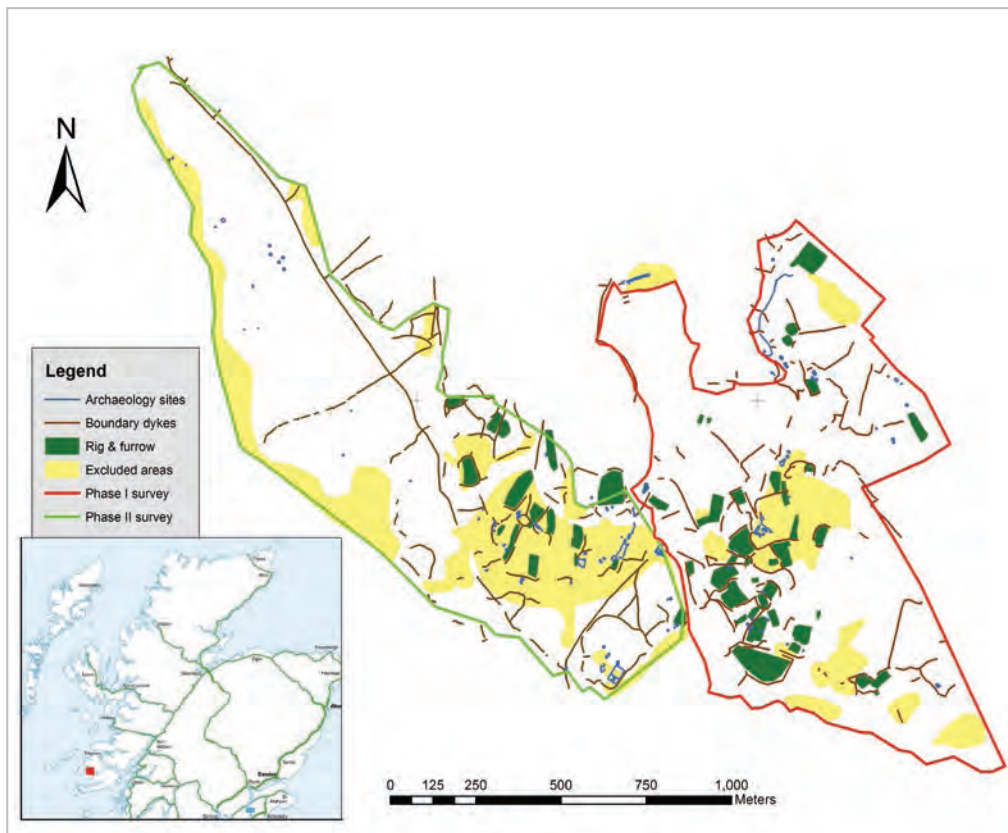
An overview of the archaeological survey within the woodland area (phase I and II).
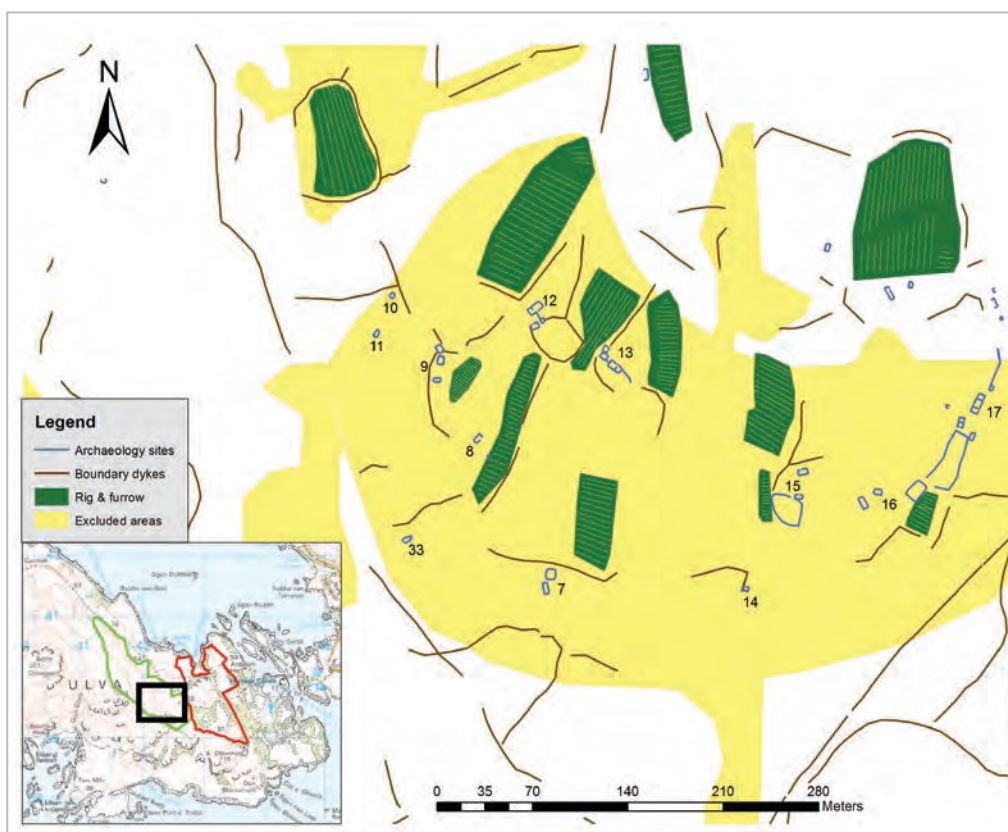
A detail from the archaeological survey highlighting an area of extensive township remains excluded from planting.
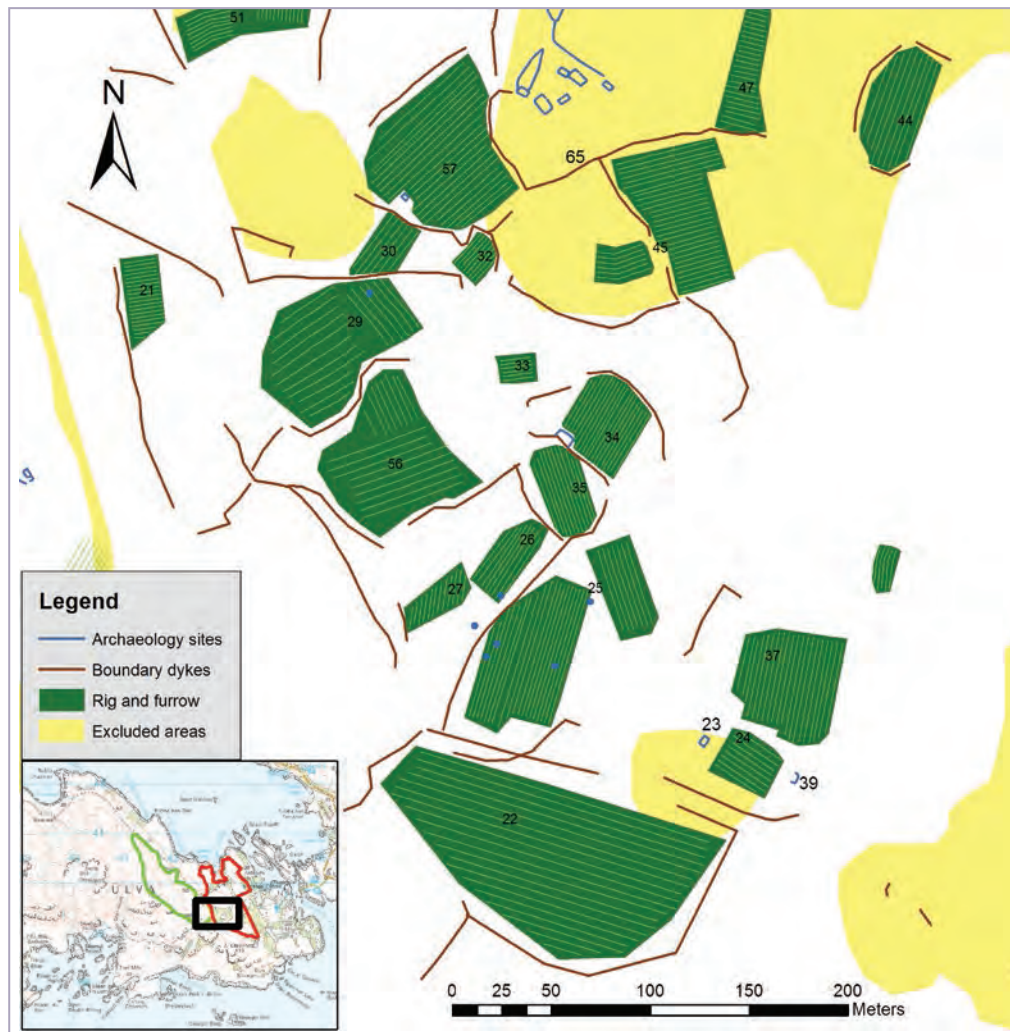
A detail from the archaeological survey highlighting an area of extensive cultivation remains. The study allowed 'preservation by record' and the inclusion of the area within the planting.

The walkover survey showed that the initial forest plan had been successful in isolating the major settlements within the proposed planting areas, along with some major boundary dykes. However, the survey revealed additional stone-built structures including houses, bothies, shielings, significant areas of rig and furrow cultivation and a complex network of boundary dykes – many showing multiple phases of construction.

Incorporating the historic environment into a Forest Plan

The survey and recording of the historic environment on the island of Ulva has informed the forest plan and final planting scheme, including the integration of buffer zones around settlement infrastructure and boundary dykes. The detailed recording of relict rig and furrow cultivation, areas that comprise some of the better quality land on the island for the planting of trees, has enabled these areas to be included in the forest plan. The project development on Ulva Estate indicates positive management with regards to the historic environment and shows that economically viable planting schemes can be designed while protecting and managing archaeological landscapes for future generations.

Forestry Commission Scotland
Coimisean na Coilltearachd Alba
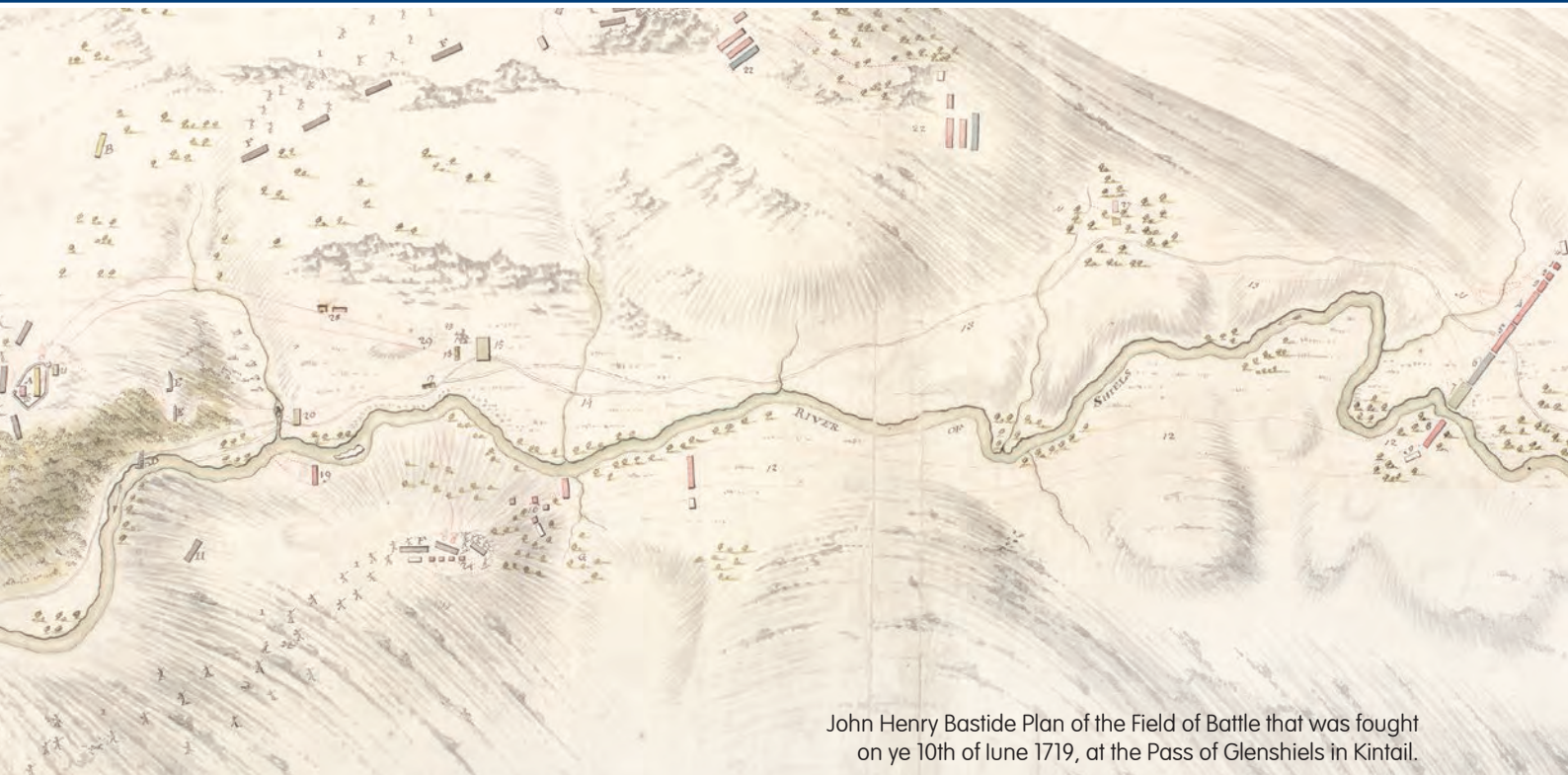
John Henry Bastide Plan of the Field of Battle that was fought on ye 10th of Iune 1719, at the Pass of Glenshiels in Kintail.

Managing the historic environment case study

The Historic Battlefield of Glen Shiel

Armies have fought for supremacy and power over Scottish soil on numerous occasions. The location of these battles was sometimes mapped on the day, as at 18th century Culloden and Glen Shiel. In other instances historians and archaeologists have had to undertake research to identify the areas over which the fighting took place, as at medieval Bannockburn. However, some battlefields will never be located, such as earlier Mons Graupius and Dunichen. Nowadays, crossed swords on an Ordnance Survey map give the clue that once a battle was fought at a particular place. But battles were rarely fought over a small area; they ebbed and flowed over fields and hillsides. Managing change within fields of conflict can be a complex issue.

Introducing the Inventory of Historic Battlefields in Scotland and exploring various options for conservation management.

Significance

Battlefields have long been valued for their links with the past. They can provide a tangible connection between people and place, culture and national identity. This has been taken forward by the creation of an Inventory of Historic Battlefields, which provides detailed information and maps for those battles that are nationally significant and whose sites are known.

Best practice

Best practice calls for consideration of a battlefield when managing the land or proposing change. The underlying landforms will not normally have altered since the day of battle, even if the land-use has changed dramatically. So immediate questions include: are the deployments of the opposing armies still inter-visible? And can the events of the day be followed on the ground? Indeed, has anything survived that relates to the battle itself? And how can elements be incorporated into proposals for land management?

Best practice should not seek to turn the clock back with attempts to re-create the landscape as it might have been at the time of a battle. Instead, time needs to be taken to gather information, discuss options with non-forestry specialists and other landowners, and develop opportunities for sensitively managing a battlefield landscape. Enhancing public access and enjoyment is a particularly positive outcome, for these places are steeped in history and emotion. These are the issues that are being addressed at Glen Shiel.

Glen Shiel

Designated as a National Scenic Area, with the iconic Five Sisters of Kintail and South Cluanie Ridge, this glen is the Road to the Isles and is used by thousands of visitors every year. However, it is not only the landscape that is of outstanding value and the glen is also the site of the Battle of Glenshiel, fought in June 1719 between Jacobite and Government troops. Indeed, it is the only battle site in Scotland that has upstanding remains associated with the day of engagement.

Forestry

Forestry Commission Scotland acquired three blocks of land in the upper part of Glen Shiel after the Second World War, including part of the field of battle. Here FCS created conifer plantations on the steep south-facing slopes between the A87 and the 400 m contour. At the time this was the only forestry in an otherwise open glen which was being used as hill grazing for sheep and for stalking. This largely tree-less landscape was much as it had been at the time of the battle around 300 years ago. More recently, the other main landowners have created and encouraged native woodland over the southern and western parts of the battlefield.

As part of its Forest Design Plan for the area, not only is FCS taking the opportunity to restructure the coniferous plantations, it is also reviewing the way in which their northern part of the battlefield is managed.

The battle of Glenshiel

As is the case for other battlefields, there is a wealth of information about this conflict in the Inventory of Historic Battlefields (www.historic-scotland.gov.uk/battlefields). Maps in the site inventory give an indication of the area involved, the initial battle lines and the ensuing movements and points of action.

These sources indicate that the whole of the FCS western forestry block lies over the field of conflict. How to enhance the battlefield landscape while maintaining the value of the area for the national forest estate is a challenge.

An aerial view of the site of the battle facing East.

Deployment map from Inventory of Historic Battlefields.
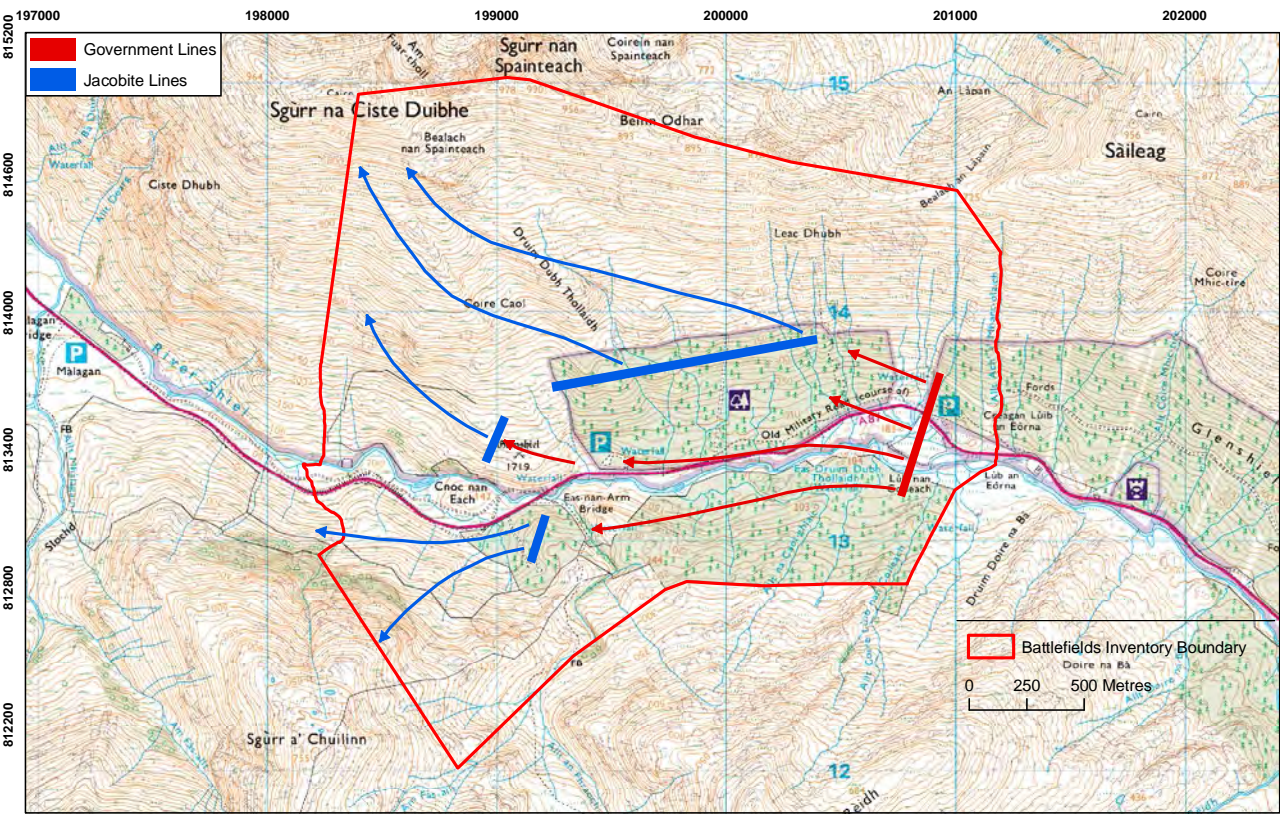
Gathering ideas

Having assessed the Inventory information, the next step was a site meeting with specialists so that the landscape could be better understood. Here the gathering brought together FCS foresters, planners, archaeologist and landscape adviser, as well as archaeologists from national bodies. In other instances foresters and land managers might seek the advice of the local authority archaeologist or other heritage experts. Involving neighbouring landowners enabled those charged with developing the Forest Design Plan to take account of their aspirations too.

Enabling change

Current proposals are taking into account the significance of the battlefield and, while also focussing on restructuring the forest as productive native woodland, there are changes that can be made to enhance the heritage value.

At present the original position of most of the Jacobite troops is hidden within the forestry block. Conifers completely mask their line from both the Government deployment to the east and the Jacobite groups to the west. It is also difficult to imagine the passage of Government troops up the hillside towards the rebels.

Sensitive restructuring design will be used to reflect these elements of the field of battle without significantly compromising the forest. The Jacobite line across the slope of Sgurr nan Spainteach could be re-established by lowering the northern boundary of the forest (**A**). Thus the upper edge of the forestry block would become the indicator for the line of the Jacobite troops. Feathering the eastern forestry edge would open up the lie of the land (**B**), removing the current N-S boundary across the battlefield, and thereby enabling visual links to be made – particularly from the initial government lines (**C**) to the Jacobite forward position on the knoll (**D**).

FCS have already created a carpark by the A87 to provide safe access for hillwalkers to the Munros of the Five Sisters ridge. By coincidence this is also where the Government troops lined up before battle commenced. One of the options is therefore to provide interpretation

Aerial view of management options viewed from Government (East).
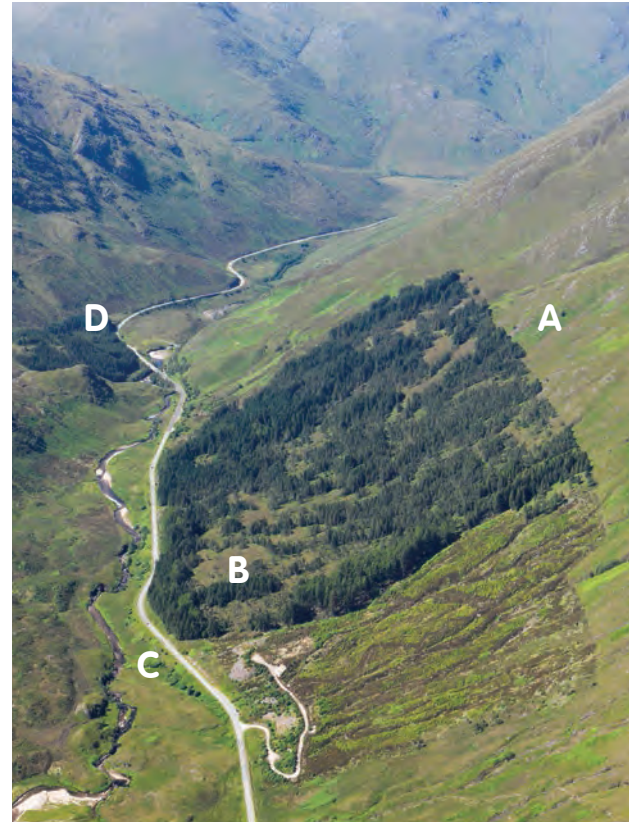
here, focussing on the initial phase of the battle – although development of a wider interpretative plan for the battlefield would include all relevant landowners.

Restructuring the southern edges of the current forest block would enable visitors to perceive some of the events of the day from this spot. They would be able to see the enormity of the task set against the Government troops. They can wonder at the fact that foot soldiers who had already spent most of the day marching across rough, trackless terrain could find the energy to attack their enemy by an up-hill climb. The chance to follow in their footsteps could provide an evocative experience for visitors.

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