



BALLACHUAN HAZELWOOD
An archaeological and historical survey
January 2004

Roddy Regan, Bob Black & Sharon Webb

Scottish Wildlife Trust
Reserves Project

Commissioned by:

Scottish Wildlife Trust

Cramond House, Kirk Cramond, Cramond
Glebe Road, Edinburgh, EH4 6NS
Tel: 0131 312 7765
enquiries@swt.org.uk

Prepared by

Kilmartin Archaeological Research

Kilmartin House Museum, Kilmartin, Argyll,
PA31 8RQ
Tel: 01546 510 278
museum@kilmartin.org

This archaeological desk based assessment and woodland historical survey was commissioned by the Scottish Wildlife Trust. The field survey was undertaken by a professional team from Kilmartin Archaeological Research assisted by volunteers organised by the Lorne Archaeological Society. The survey was conducted between 8th-11th January 2004. The survey revealed the remains of over 20 structures scattered over the reserve and probably associated field systems, mainly rig and furrow. The settlement appears to date from at least the early 17th century and could well be earlier, although how early was impossible to determine by field survey alone. Of particular interest are a structural grouping situated on the southern heights of the ridge running along the Reserve, their position perhaps hinting at a much earlier presence. From the beginning, the settlement appears to bear the name of Ballachuan, although this name is maintained beyond the settlements life after the 18th century when it is applied to the Farmstead, Loch and the immediate area. Later activity within the Reserve is evidenced by quarrying/mining and the plantation of Beech trees for the amenity of the Breadalbane Estate.



Acknowledgements

The Kilmartin Archaeological team consisted of Andrew Clarke, Candice Hatherley, and Sharon Webb, directed by Roddy Regan. The woodland survey was conducted by Bob Black. The authors would like to thank the volunteer team who consisted of: Alison Blackwood, Lindsay Campbell, Kenny Carmichael, Maggie Dean, Clare Marren, Gemma Midline, Ewan Regan, Morag Smith and Michael Turner. The team worked very hard and managed to remain cheerful despite the difficult weather conditions and hard terrain.

Special thanks are also extended to Alison Blackwood (of the Lorn Archaeological and Historical Society) for organising the volunteer workforce. Thanks are also due to the Hon. Michael Shaw for providing verbal information on the Reserve. Mention must also be made of the help given by Murdo MacDonald, the Archivist of Mid Argyll and Dr Fiona Watson, for advice on the Breadalbane Collection.

Contents

Introduction

1. Site Description and Background	2
1.1 Topography	2
1.2 Vegetation Cover	2
1.3 Past Research	2
1.4 Archaeological Background and Past Land Use	3
2. Archaeological Field Survey	3
2.1 Methodology	3
2.2 Field Results	5
3. Ballachuan Hazelwood-Woodland History	20
3.1 Historical Facts and Theories	20
3.2 Hazel Longevity	22
3.3 The History of Woodland Management at Ballachuan	23
4. Historical and Archive Material	30
4.1 Historical Notes	30
4.2 Cartographic Evidence	30
4.3 Sasines	32
4.4 Breadalbane Collection	32
4.5 Statistical Account	35
4.6 Aerial Photographs	36
5. Archaeological Discussion	36
6. Suggestions and Recommendations	38
6.1 Recommendations for further Archaeological work and Historical Research	38
6.2 Suggestions for further Woodland Historical Research	39
7. Site Gazetteer	40
8. Structural Descriptions	43
Bibliography	45

Introduction

The purpose of this report is to collate and summarise the known and potential archaeology and woodland history within the woodland Reserve and the immediate surrounding study zone of c.1 km, as defined by the area shown in Figure 2.

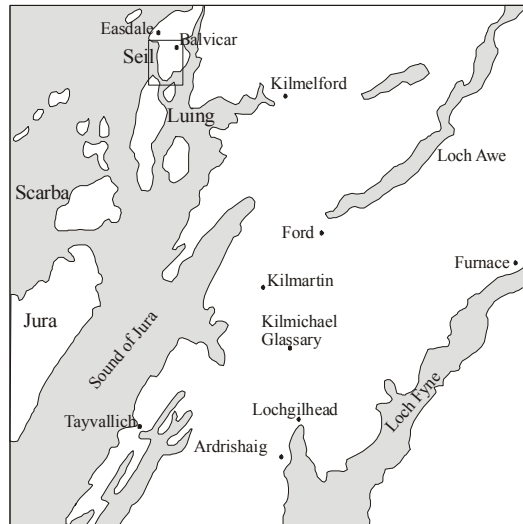


Figure 1. Reserve Location

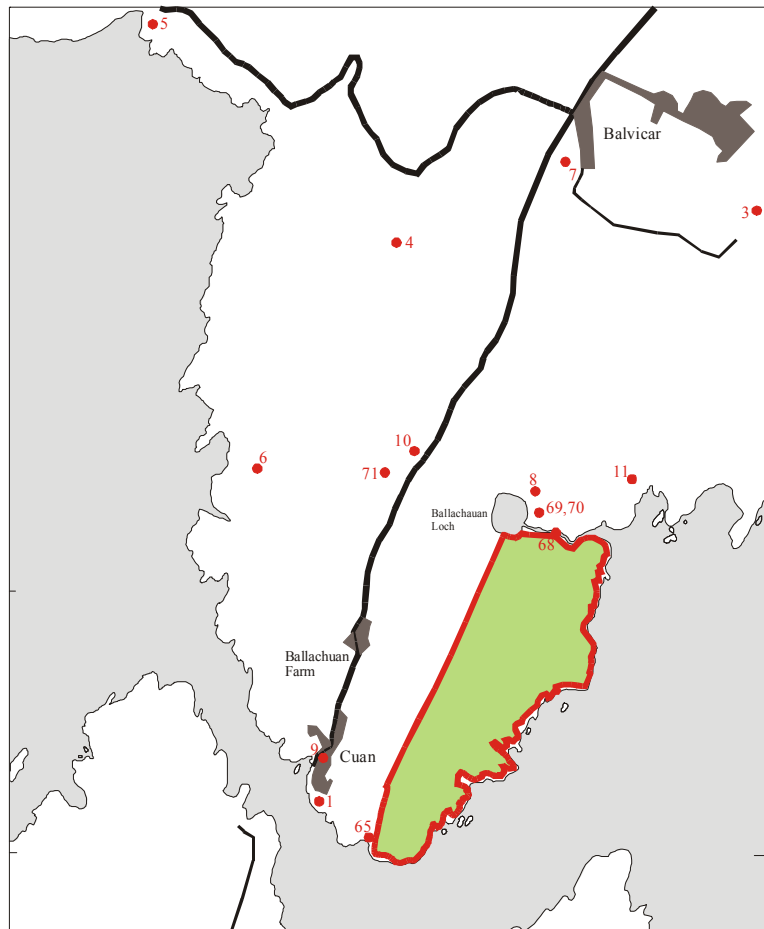


Figure 2. Location of Study Area (numbers refer to site gazetteer)

1. Site Description and Background

1.1 Topography

Ballachuan Hazelwood (Figure 2, centred NM 763146) is situated on the south east coast of Seil Island. Covering some 49 ha (107 acres), the Reserve is dominated by ancient, semi-natural hazel woodland with areas of wet and dry grassland.

The underlying geology is part of the Dalradian group of the late Precambrian period, 600-800 million years old. An epidiorite ridge runs NE-SW along the eastern part of the Reserve, with outcrops of black slate and bands of limestone (Moseley and Morrison 1998). The ridge forms a steep western facing escarpment dropping off more gently to the east, with the highest parts of the Reserve lying at between 30m-35m AOD. The ridge is effectively divided into northern and southern parts by a valley containing a spring and burn, the later running south-east into Seil Sound. The northern part of the ridge contains more even ground forming a 'plateau' area lying between 15m-20m AOD. The southern part of the Reserve is steeply sloped by comparison, although an area of relatively even ground lie on the upper slopes of the south-western part of the ridge.

Soils forming above the underlying rocks are mainly a yellow brown clay silt, although peat has formed within natural hollows and on the lower flatter ground within the western and central parts of the Reserve.

1.2 Vegetation Cover

The majority of the survey area was covered by hazel stands, with areas of more open grass heath at the base of the ridge to the west and lower central area of the Reserve. Within the fenced area at the north of the Reserve grazing has retained large open areas of grass cover, dotted with hazel stands and moss/bracken covered rock outcrops. Much of the open areas without the fenced areas had bracken cover, although given the time of year much of this had died back. The ground, predominately within the wooded areas, was covered with moss growth and leaf litter.

1.3 Past Research on the Wood.

Much information has been collated from the National Monuments Record of the Royal Commission of the Ancient and Historical Monuments of Scotland, in particular their published inventory for Lorne (RCAHMS 1975).

Several other surveys have been carried out looking into past land use at Ballachuan.

In 1985 the Lorne Archaeological and Historical Society (LAHS) began a field survey of the Reserve, which noted the presence of structures and field systems covering an extensive area of the site (Campbell 1985).

In 1993 a transcript of information was collated from the National Monuments Record Scotland and prepared for the Council of Scottish Archaeology, pertaining to Scottish Wildlife Trust Reserves (Carmichael 1993).

Other relevant notes have also been made available; of particular interest is a transcript of a personal letter from Mr Alex Thompson, detailing his acquaintance with Ballachuan wood from his childhood and in later life (Moseley and Morrison 1998).

Some light has also been shed on the past ownership and history of the wood within notes prepared by Charles Hunter (Hunter 1995).

Transcripts from the LAHS survey and Mr Thompson's letter were subsequently included within the Management Plan prepared by the Scottish Wildlife Trust for Ballachuan Wood (Moseley and Morrison 1998).

The results of the above surveys and the information obtained from them, will be included within the relevant sections of the report.

1.4 Archaeological Background and Past Land Use.

Gaelic in origin, the name Ballachuan means 'settlement by the sea', which is apt, given proximity of much of past settlement to coastal areas in the Western Highlands. The southern tip of Seil, particularly the area immediately to the north and west of the Reserve, have long been noted for evidence of past human activity, most of these sites previously recorded within with the RCHAMS Lorn inventory.

Mesolithic and Neolithic

No evidence from these early periods have as yet come to light in this area.

Bronze Age

Activity dating to the Bronze Age was evidenced by the recovery of a flint scraper from Cuan Ferry. A possible oval cairn was also reported in 1967, and this may have had a prehistoric origin (Sites 1 and 2, Figure 2). While limited in nature, the evidence suggests a human presence at this southern tip of Seil from at least the Bronze Age.

Iron Age and early Historic Period

Evidence of a more substantial nature is seen with two promontory forts at Balvicar and Cnoc an Tighe Mhoir (Sites 3 and 4, Figure 2). While these await excavation and tighter dating, they most likely date to the later Iron Age period and certainly indicate that the locale had been extensively settled by this time. This picture is perhaps further enhanced by the presence of two smaller fortified enclosures or Duns, Dun Aorain and Dun Macaig (Sites 5 and 6, Figure 2). While the Duns and Forts may not necessarily be contemporary, they still present a picture of a fairly dynamic cultural system, giving rise to the creation of these defended structures. Again without

excavation, or indeed any other dating evidence, the span of use life of these structures is open to question.

Medieval

Two ecclesiastical buildings are present within the area surrounding the Reserve. Certainly of Medieval date, is the Old Parish Church, Kilbrandon, Site 7. Tombstones within the graveyard indicate that the building dates from at least the 14th century, although its consecration may be older still. Of probable Medieval date are the remains of a chapel and burial ground lying at the north end of Ballachaun Loch (Site 8), although again without lack of secure dating evidence the exact Medieval provenance of this edifice is open to question.

Post Medieval

Later ecclesiastical history is evidenced by a further sequence of churches. Built in 1735 the church of Kilbrandon and Kilchattan was replaced in 1864 by the present Parish church of Kilbrandon (Sites 9 and 10). Serving the parish was the Manse, Kilbrandon House erected in 1827 and is now the private residence of the Shaw family (Site 11).

2. Archaeological Field Survey

2.1 Methodology

The walkover survey was conducted with participants forming a single line, with each individual person spaced 10m apart, and walking transects across the site.

The spacing of the hazel stands within the mature woods was enough to allow considerable freedom of movement while conducting the survey, although in areas of younger stands and other cover such as blackthorn thickets, movement was much more restricted. Steep precipices were avoided for obvious reasons, although these were scanned from below for any evidence of activity.

When a feature worth note was identified it was marked and allocated a feature number from a running index. Ordnance Survey locations were noted for each feature using a hand held Global Positioning System (GPS). All buildings and possible structures were then planned at 1:100 with notes and measurements taken. Photographs were also taken using digital and SLR cameras. The overall site code for the wood was BAL 04.

All sites and features are listed as entries within the Site Gazetteer and plotted within the relevant figures. Sites without the Reserve but pertinent to the survey are also listed within the Site Gazetteer (Sites 1-11, 65, 68-70 Figure 2). The entries within the Gazetteer also give Ordnance Survey Co-ordinates and brief descriptions of the sites/features, references where appropriate are also quoted. Fuller descriptions of buildings, and where appropriate plans, appear in the Structure Descriptions.

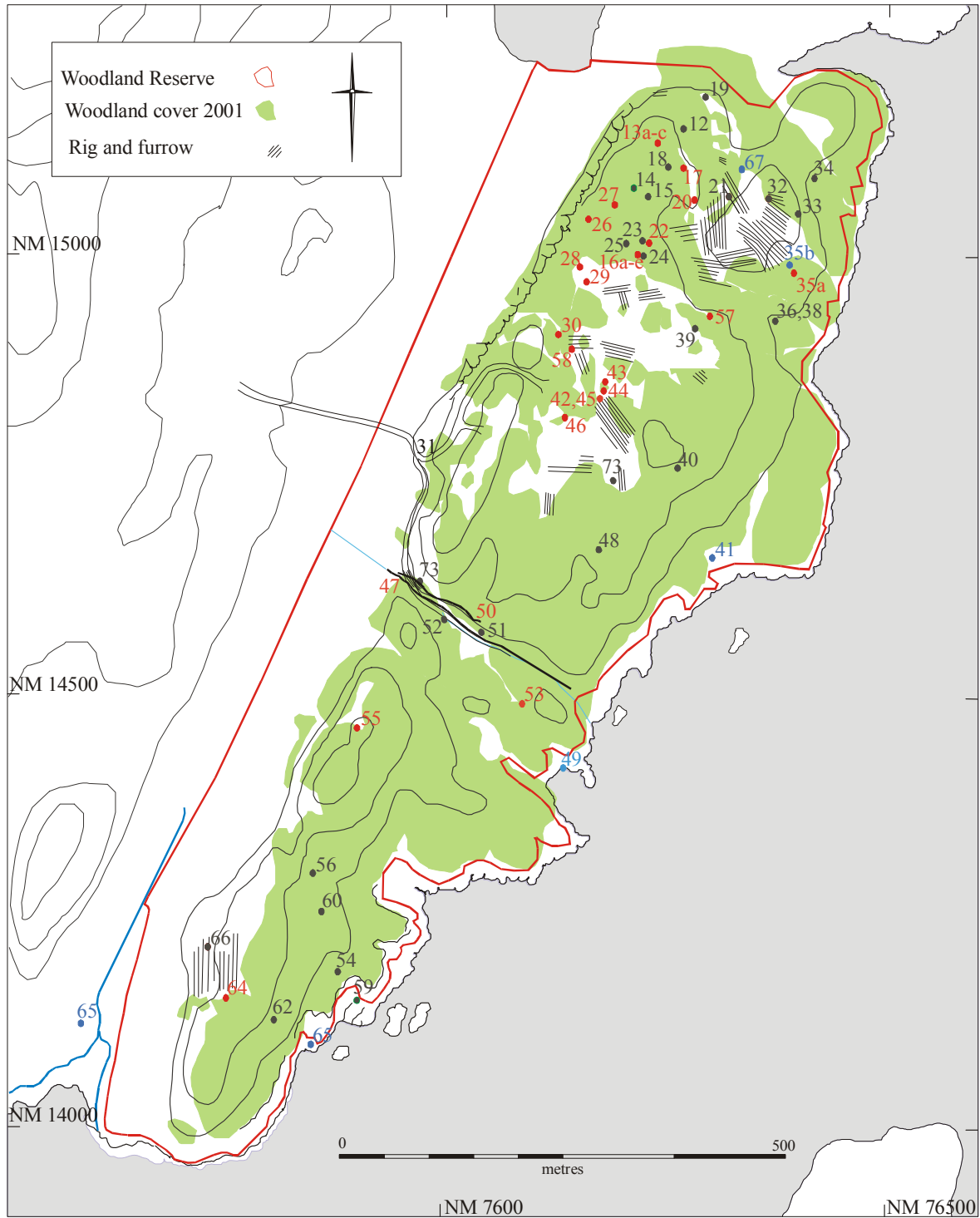


Figure 3. Features within the Reserve (Numbers refer to site gazetteer, differences in colour of number have no significance).

2.2 Field Results

During the field survey within the Reserve 76 features were noted, but some of these were subsequently revealed to be same object, i.e. different ends of the same wall/trackway, these were combined leaving 62 individual features/sites (Sites 12-64, 66, 67, 71-73 Figure 3). These are grouped below by site type.

2.2.1 Structures

The remains of buildings appear to quite widespread within the northern part of the Reserve, most, perhaps not surprisingly, located around and within the central plateau area of the site. The buildings mainly took the form of tumbled groups of moss covered stones (see Structural Descriptions below). While some buildings were apparent and presented definite ground plans, others were inferred from partially buried alignments of walling with rectilinear hollows the latter possibly indicating the presence of building stands.

Numerous clearance cairns dotted the site and some of these, especially the more substantial, may conceal buildings. A collapsed structure in many cases may appear as no more than a pile of stones, especially if a ruined building was subsequently used as a dumping area for cleared stones. The less clear buildings as appear in the Site Gazetteer have been divided into probable buildings and possible buildings. Buildings within the former group are more likely than not to represent a real structure, whereas the question over the latter group would only be resolved through excavation.

The majority of the buildings were located on the eastern slopes of the ridges running along the western side of the open plateau area. Spatially, certain structures may be grouped together and some are likely contemporary.

At the north west of the Reserve, overlooking the lower ground to the west, was a group of five possible structures, **13a-e** (Figure 4). The buildings here were badly decomposed, with most of the structures were inferred from wall lines and flat rectangular sunken areas. This group of structures sit within a network of possible paths or hollow ways leading west and east to cleared areas that probably represent small fields.



Figure 4. Structures 13a-e



Figure 5. East Facing wall in Structure 13a

Also located to the west of the open plateau area was another group of structures **16a-e**. Building **16a** appears to be the main building, with sub oval structure **16b** possibly a subsidiary building. Both **16a** and **16b** are located at the foot of a steep slope at the junction of flatter possible field areas to the east and south.

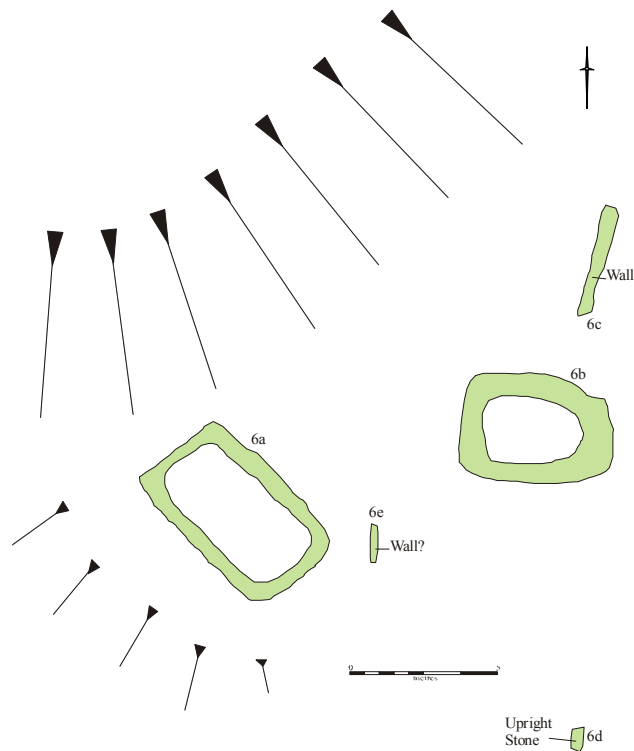


Figure 6. Structures 16a-e



Figure 7. Structure 16a



Figure 8. Structure 16b

Structures 17, 20 and 22 are also strung along this east-facing ridge, although these appear not to be grouped with other structures

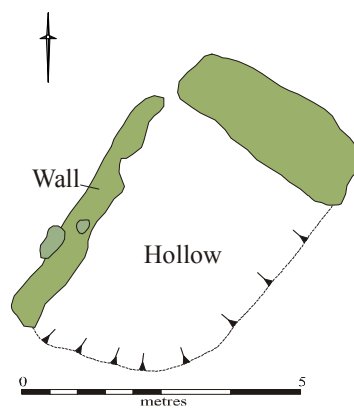


Figure 8. Structure 20

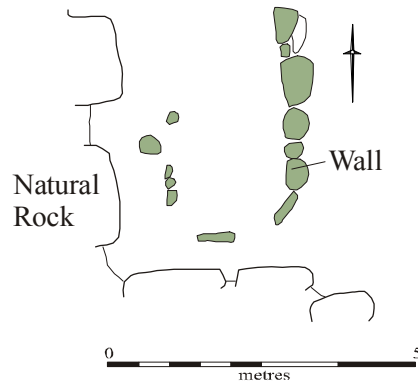


Figure 9. Structure 22

The proximity of structures **27**, **28** and **29** suggest these also form a group, with structure **29** possibly the main building, structure **27** a subsidiary building and **28** a small circular structure, perhaps a small corn drying kiln?

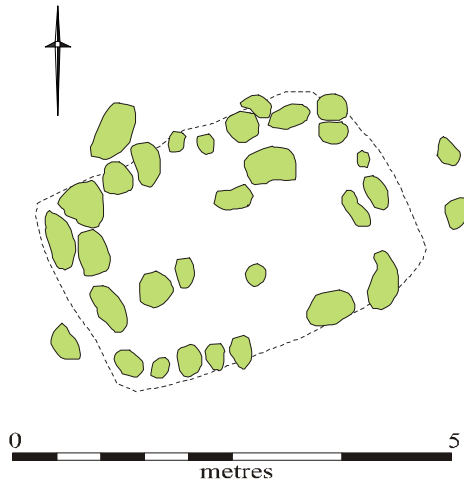


Figure 10. Structure 27

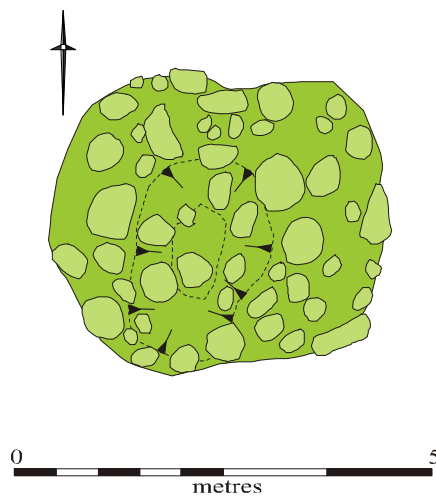


Figure 11. Structure 28

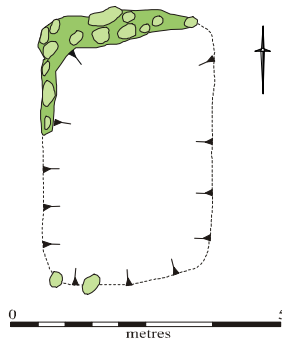


Figure 13. Structure 29

Similarly, given their proximity, structures **30** and **58** may be related, although **58** lay east, off of the preferred ridge chosen as the locations for many of the buildings.

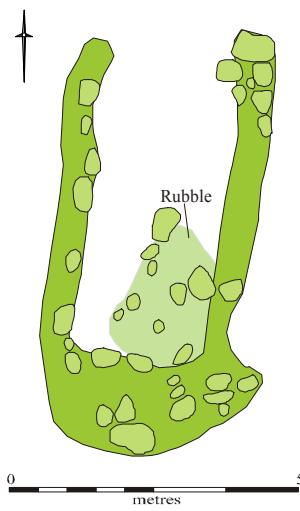


Figure 14. Structure 30

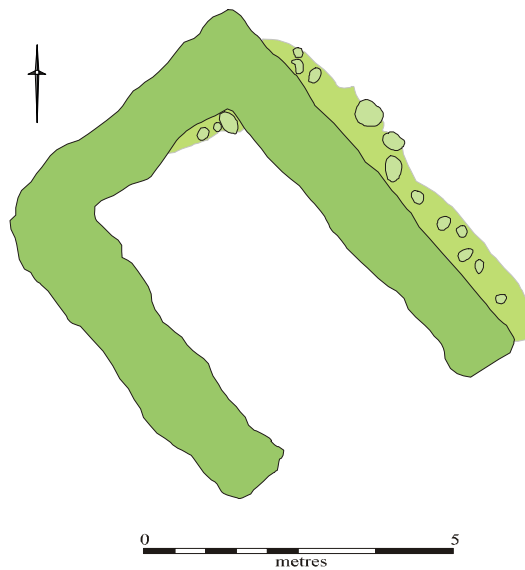


Figure 15 Structure 58



Figure 16. Structure 58

Other buildings lying away from the east-facing ridge were, structure 45 and, possibly associated, structure 44.

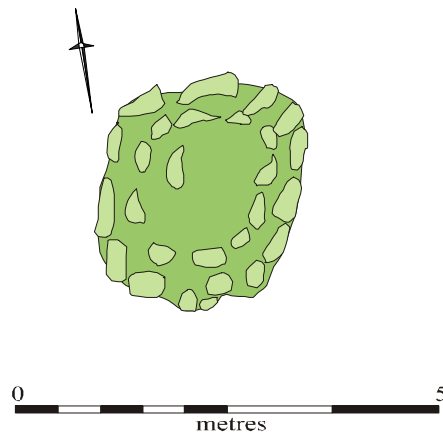


Figure 17. Structure 44

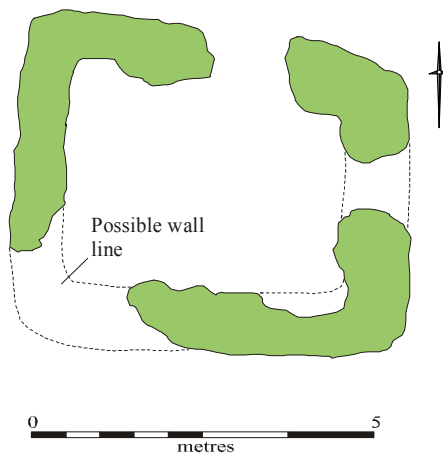


Figure 18. Structure 45



Figure 19. Structure 44



Figure 20. Structure 45

Structure 57 was also situated within the western 'plateau' area.

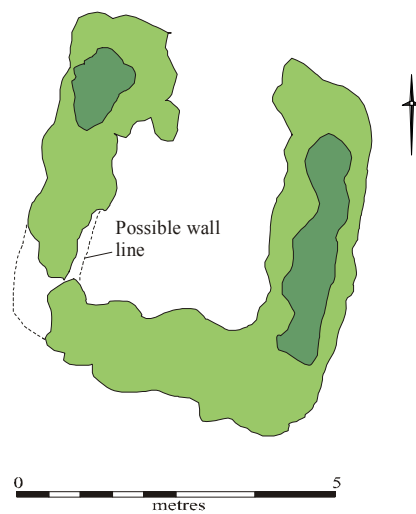


Figure 21. Structure 57

Located off the plateau area and situated on the eastern slope of the ridge dropping to Seil Sound was structure **35a**. In this case, however, the building would appear to be associated with a nearby quarry **35b**. (see below).

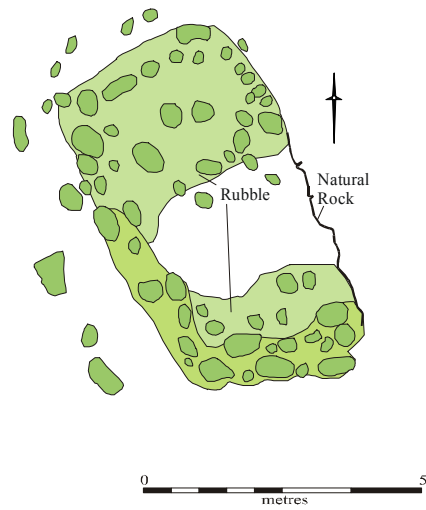


Figure 23. Structure 35a



Figure 24. Structure 35a



Figure 25 Structure 64

Buildings within the southern part of the Reserve were scarcer, or were not apparent. One group of possible buildings, however, were recorded situated on the highest point at the southern end of the ridge **64**. Pulling back of a small part of the undergrowth revealed traces of walling amid a jumble of humps and hollows, although a clear picture of any structural layout was difficult to obtain.

2.2.2 Fields

While the presence of even and cleared areas was apparent within the fenced and open areas of the Reserve, others less apparent lay within the now tree covered areas. These areas were recorded as features (**12, 14, 15, 18, 19, 23, 24, 25, 32, 33, 34, 36, 38, 40, 56, 59, 60** and **62**). Most of these ‘fields’ appeared as even, or slightly sloping ground that had been cleared of natural stones or rubble many with clearance cairns to one or both sides.

The aerial photographs (AP’s) of the Reserve reveal that most, if not all, of the even and cleared ground was utilised as rig and furrow, and it seems likely that any relatively even cleared ground was also used as fields. The rig and furrow is only now apparent within a few areas of the Reserve, for example Sites **21** and **39**, this where the ground has been grazed and not been extensively disturbed by cattle. Elsewhere, particularly within now wooded areas the pattern of rig and furrow, if it existed has probably been lost to the collective effects of leaf litter and hence soil build up and in the lower damper areas sphagnum/peat growth has tended to disguise these patterns over time.



Figure 26. Rig and Furrow

Without the flatter plateau, areas of more even ground may have been used/created as cultivation terraces these running along some of the sloping sides of the ridge.

Smaller areas set within the sloping sides of the ridges give the appearance of once cultivated terraces, areas of level ground created by cutting into the sloping hillside and levelling the down slope side creating a level area for horticulture or agriculture.

While smaller flatter areas were encountered during the survey none had the appearance of being recessed platforms and there was no evidence that they had been used for charcoal production.

2.2.3 Clearance cairns

Many of the areas surrounding the field systems were dotted with what appeared to be clearance cairns. Most of these seemed to consist of localised mounds of cleared natural stones that presumably derived from the surrounding fields. The amount of cairns and their generally small size suggest that much of the clearance was done in a piecemeal fashion.



Figure 27. Clearance cairns.



Figure 28. Clearance along one side of an open field

The cairns varied in size from a few metres across and less than a metre high to much larger collections that may have been the result of more systematic clearance. Cairn **37** is recorded below as typical example, although the cairns were too numerous to record individually.

2.2.4 Tracks

While the level plateau area of the ridge was accessible from the more gently sloping areas from the north, the main access to fields and probable steadings was along a zig-zag track which climbed the steep western escarpment, **31** of the ridge. This track, from the base of the ridge also appeared to give access to the sea, skirting the lower ground on the western side of the ridge before heading down to the sea along the central valley between the northern and southern area of the Reserve. Other natural gullies along the eastern side of ridge may also have been utilised to give access to the sea along Seil Sound.



Figure 29. Cleared trackway/field now in woods

2.2.5 Enclosures

Few enclosure walls, dykes or ditches were recorded within the settlement plateau, although several small lengths of dyke were evidenced. These however appear to be closely associated to buildings such as walls **16c** and **43**, and these may have acted as localised divisions rather than defining wider properties or fields boundaries. More systematic attempts at division are seen with the construction of two walls **47** and **50**.



Figure 30. Wall and ditch 47

Both walls are aligned NW/SE running through the base of the valley between the northern and southern parts of the site. Wall **47** also has the remnants of a ditch running along its southern side. Wall **50** skirts closer to the foot of the slope than wall **47** although both walls converge at their western ends. If preservation is an indicator of age then better preserved wall **50** would appear to post date wall **47**, although both must have served a similar function as a property boundary. The alignment of the walls was continued west as a ditch across the wetter, low lying area to the west of the Reserve.

2.2.6 Quarries

The small quarry, **67**, may be no more than a prospecting quarry, given its size and lack of associated spoil. Of slightly more pretension was **35b** associated with structure **35a**. This does not appear to have been used for bulk stone removal nor does it appear quarrying/mining was undertaken on a large scale. It may be again that was a speculative enterprise, perhaps for lead that failed to amount to much.



Figure 31. Lead Mine 41

Probably slightly more successful was lead quarry **41** situated on the coast of Seil Sound. This took the form of a strip mine that appears to have followed a seam of ore bearing rock. Spoil mounds were located around the entrance and the sides of the mine, with the ore bearing stone, judging by its heavy weight and oxidised nature, thrown up and possibly collected on the northern spoil heap.

Despite its proximity to the sea no attempt appears to have been made to construct a landing near to the quarry, although boat could be easily accessed within the shallow bay.

Slate quarry **65** lay just outside the southern end just without Reserve boundary, although some of the accumulated spoil lay within the Reserve. Again this appeared as a strip quarry, the quarrymen following a seam of slate.



Figure 32. Slate quarry 65

2.2.7 Jetties/landings

While boats could have easily been landed within the many natural embayments located along Seil Sound only two areas within the Reserve appear to have been specifically cleared to allow easier access for boats.



Figure 33. Jetty 49

Slipway **63** was an area of foreshore cleared of larger stones, while some more effort appears to have been put into jetty **49**, the stones here piled to form a rough constructed landing. Another landing was also noted to the south west of the Reserve this no doubt serving the slate quarry **65**.



Figure 34. Cleared slipway

2.2.7 Springs

Two natural springs (**6** and **5**), were noted and its possible both have been utilised for drinking water, whether this be for animals, humans or both. This is particularly the case with spring **52**, which emerges at the base of the valley separating the northern and southern parts of the ridge.

2.2.8 Other Features of Note

A hollow (**73**), within the plateau area, appeared to have been utilised as a collection point for water and may have been utilised as a drinking hole for animals and/or humans.

Several mature beech stands were located on the upper part of the eastern side of the ridge dropping down into Seil Sound including Sites **33** and **40**. The trees were planted by the Breadalbane Estate for ‘amenity’ reasons, and do appear to be the result of ‘bundle planting’ (see Woodland History below). The trees themselves occupy cleared and generally more even ground, suggesting the Estate may have utilised existing agricultural terraces for this project.

It would appear that the Breadalbane family were also responsible for the artificial cut (**68**) leading from the sea to Ballachan Loch, lying just north of the present Reserve boundary. This project was probably undertaken to give relief work to unemployed Slate workers around 1880, the purpose being to improve the sporting facilities of the Estate by allowing sea trout access to the Loch (Campbell 1985).



Figure 35. Beech stand on level cleared area

3. Woodland History

3.1 Introduction

Interest in the history of the hazelwood at Ballachuan has increased greatly over recent years with the growing recognition of the ecological importance of the wood, both as a habitat that supports a lichen flora of international importance and as a prime example of “Atlantic hazelwood”, a distinctive woodland type restricted to the Atlantic seaboard of the UK.

This interest has been accompanied by a recognition that we know very little about the history of the hazelwood. Knowledge of its history would help to explain how the wood came to be how it is today and to define future management decisions.

This section of the report summarises what is known about the woodland history of the hazelwood. Fieldwork consisted of a walk-over survey conducted in January 2004 and a photographic record of indicators of past management. Suggestions for further work that could improve our knowledge of the history of the woodland appear within Section 6 of this Report

3.2 Historical Facts and Theories

3.2.1 After the Ice Age

Hazel was one of the first tree species to colonise the west coast of Scotland after the last disappearance of glaciers about 10,000 years ago (10,000 BP). Work by H.J.B. Birks (1989) and others has enabled us to build up a fairly detailed picture of how various tree species moved in to the presumably treeless Scottish landscape of c.10,000 BP. This picture has been made possible through studying the distribution of pollen deposits of different species over time.

Birks produced an isochrone map for the British Isles (a map that joins points having

similar occurrences at the same time) for various tree species, showing the approximate time that pollen from this particular species first appeared. The map for hazel is exceptionally interesting in that it shows a colonisation of Britain from the west and at a very early date, i.e. before 9500 BP. Hazel rapidly became widespread and very abundant throughout the west coast.

By this time, downy birch was well-established on the west coast, but there were few other species. This is about 2000 years before oak appeared in Argyll and about 6000 years before ash.

Much of this sequencing has been known for some time and has been described by D. N. McVean (1964) amongst others. However, until very recently, it was assumed that high-forest tree species eventually replaced hazel as the dominant species, with the latter generally relegated to the subordinate role of shrub-layer species, except in the most exposed places. Thus, relatively sheltered hazel-dominated woodlands such as Ballachuan were generally seen as high-forest woodlands that had lost their canopy tree species. Indeed, Ballachuan's first Scottish Wildlife Trust management plan in 1985 states that "hazel scrub of this type is typical of western Argyll [but] it cannot be regarded as representative of the original forest cover of the region which is more likely to have been mixed oak-ash-elm woodland with hazel understorey and possibly an evergreen component of holly and yew".

At the present time, oak and ash trees within the wood are limited to a scatter of isolated trees. However, a wood at Ardinamir on the adjacent Isle of Luing has a similar woodland structure but contains far more ash. Ash, oak and elm woodland across the water at Ardmaddy has hazel as a locally-abundant shrub-layer species, just as described in the management plan. But there is no clear evidence that Ballachuan ever had such a cover.

It is quite possible that what we see today is a woodland which is essentially unchanged from the woodland that developed soon after the last ice age. This would mean that the woodland is both extremely ancient and highly natural in character.

3.2 Hazel longevity

One reason for thinking hazel is capable of maintaining local dominance, is the observation that over the last 20 years hazel-dominant stands at Ballachuan have shown no sign of allowing other species, apart from beech, to gain dominance. The oak and ash that remain within the Reserve occur as isolated individuals, often at the edge of stands. Lack of light within stands, combined with even low levels of browsing pressure appear to be sufficient to suppress germinated seedlings. This applies to hazel seedlings as well as those of other species.

H. Godwin (1975) and O.L. Gilbert (1984) both suggested that exposed sites along the atlantic seaboard may have carried stands of hazel for many thousands of years. Gilbert was studying the lichen flora of the Isle of Eigg and concluded that one of the main reasons for assuming that the woodland he was studying was "a little modified fragment of the ancient climax woodland" was that it had "an outstanding range of western oceanic epiphytes". Ballachuan has both a community of shrub and field layer species similar to that described by both Godwin and Gilbert, and an epiphytic

flora with an outstanding range of western oceanic epiphytes.

In recent years much of the impetus for learning more about Atlantic hazelwoods and the hazel of Ballachuan in particular, has come from lichenologists. The surveys of lichens at Ballachuan by A.M. & B.J. Coppins (Coppins & Coppins 1997 and 2000) identified 34 lichen species that require ecological continuity. This indicates strongly that there has been a long history of continuous hazelwood cover at Ballachuan, though it does not prove that the cover has been continuous throughout post-glacial history.

It is commonly thought that hazel is a short-lived species and this assumption can still be found in much contemporary literature about hazel management. In an attempt to throw light on this idea, the age and health of stems in a group of nine stools at Ballachuan was recorded in 1994 and monitored in 1999 (Black 1999). This survey suggested that the proportion of young stems to older stems had declined slightly, but not dramatically over five years, i.e. the stools are ageing. However the survey used a very small sample base and a short period of time, so the results have limited validity. Most stools show a healthy range of stem ages as can be seen in Figure 40.

Research, notably that of Hægeström (2000) now suggests that hazel is potentially a very long-lived species. Again, this research is inconclusive but it is possible that some of the stools that Hægeström studied in Finland may be several hundred years old. Moreover, there is evidence that as stools age and die, satellite stools develop in a ring around the original centre of the parent stool, so perpetuating the hazel stand.

To test this theory, Gulliver (2002), has studied the genetic relationship between stools that appear to form rings at Ballachuan. He has shown that for at least some of the rings, apparently made up of separate stools, stools are clonally related, strongly suggesting that individual plants are able to regenerate vegetatively and persist for a very long time. This implies that under certain conditions, such as those present on the Atlantic seaboard, hazel woodland has the potential to form a stable ecosystem, not dependent for its continued existence on management input from man.

3.3 The History of Woodland Management at Ballachuan

It is impossible to understand the history of any British woodland without an understanding of its human management.

We know nothing about early land management at Ballachuan. We can assume this management started a very long time ago. We now have evidence of man's activity on the west coast going back 9000 years and it may be that man has influenced the development of woodland over much of this time.

The Sunart Oakwoods Research Group (2001) observed that "hazel-nuts appear to have been an important and easily stored food throughout the ages, and we suspect that the rapid spread of hazel in the post-glacial period was assisted by the Mesolithic people", however, this theory is not proven. Hazel has a highly efficient method of seed disposal that includes movement of seed by small mammals and birds and, significantly, ability to survive in a viable state in seawater for at least 90 days (Ridley 1930, Birks 1989, Gulliver 2002). All we can say with certainty is that hazel has been

around continuously for at least 9500 years and that humans have been around for most, if not all, of that time.

It is certain that humans could have cleared the hazel, or allowed it to disappear, a long time ago. Most land adjacent to Ballachuan which could have supported hazel has been cleared, with fragments of hazel and birch woodland persisting here and there. For such a large area of hazel (c.27 hectares) to persist, especially with a substantial settlement located in the midst of the wood, there must have been a good economic reason to allow it to persist and to protect it from the effects of fire and browsing animals.

3.3.1 Fire

A major fire burnt through the wetland and into the western edge of the hazelwood in 1996. It is easy to imagine that if this fire had been followed by intensive browsing of the regrowth, the burned area of hazelwood would have become permanently open ground.

3.3.2 Browsing and Grazing

Hazel is vulnerable to browsing animals. This can be illustrated by an experiment carried out in 1990. A few hazel stools were cut and most were protected from browsing. This protection was of two kinds; some stools were protected by a palisade of cut stems and some by enclosure with a low fence. A few stools were left unprotected. This area has not been stock-grazed since 1984 but it is browsed by roe deer with the very occasional visit from red deer. Regeneration from the unprotected stools was repeatedly browsed back so that now those stools have disappeared or are just surviving, but unable to produce stems above browse height. This indicates that, once cut, it would not be difficult to lose the hazel to browsing animals unless it was protected, though at the time when the area was settled and cultivated, deer were probably far scarcer than they are now.

We know that the whole woodland has been grazed by stock. It was grazed by both cattle and sheep at the time the Reserve was bought by SWT in 1984 and there was undoubtedly a long history of grazing before that. Thompson (1985) recalls that up to 60 young stock grazed the woodland each winter. The wood would have provided valuable winter shelter for cattle. This grazing was clearly compatible with the maintenance of a woodland cover, though at the time the settlement was populated and probably later, areas of open ground were cultivated, implying that, at least at that time, grazing was carefully controlled and confined to specific areas.

3.3.3 Coppicing

The best-known use of the hazelwood was as a source of coppice material. Thompson (1985) has described from personal memory descriptions of how the hazel was utilised. Nuts were gathered for food. Apart from that, hazel stems or 'wands'

“ had many uses. Some were split and used as framework for the rough baskets of unpeeled willow used for fishing and a larger version used for potato skips. Unsplit, they were used as framework in larger baskets and, at about the same diameter as

frames for lobster creels. Tied in bundles..... they were used as fenders along the side of boats, instead of the now all-pervading car tyre, to prevent damage when coming alongside piers, etc. The last boats I saw with hazel used for this purpose were the "puffers" which used to ply up and down the coast carrying coal, lime, road metal, etc. There was another use for hazel which may have been peculiar to the district. The rods were soaked in water, weighed down with stones and used to support short heavy chisels. The method used was to wrap the smaller end of several rods round the chisel, then twist them together to form a handle two to three feet long. Short pieces of hazel were used as wire supports for rabbit snares, tethering pegs were usually made from split ash or oak"..... "At one time there was an allocation of a cartload or two per annum to the local farms of the Breadalbane Estate of hazel branches. These were used to keep hay and oat stacks off the ground."

The above mentioned chisels were predominantly for use in the slate quarries of the area that flourished between late 17th century and 1881. Though quarrying continued at Balvicar into the 1960s, it is unclear whether hazel was used at all in those latter years.

Until very recently, it was an assumption that the life of individual hazel stools was dramatically shortened without coppicing, and that this coppicing was carried out on the English model, with small areas or 'coupes' clear-felled at regular intervals of between 7 and 15 years. This assumption of coupe-felling is still widely held, though there is mounting evidence that it could not have been the method used at Ballachuan.

One reason for the assumption that coupe-felling has taken place comes from the natural growth habit of light to moderately browsed hazel. This takes the form of a number of small stems growing from the one stool, a shrubby habit rather than a tree-like habit, though it should be noted that in some circumstances, particularly where grazing is heavy, hazel can develop a substantial trunk with few if any smaller shoots. This shrubby growth habit can give the impression that all the hazel has been cut-over relatively recently.

Another characteristic of hazelwoods is the variation in growth habit from place to place, with some stands containing tall hazel, others having smaller individuals with perhaps a greater abundance of stems. This has been interpreted as evidence of coupe-felling, though it is far more probable to be a result of differences in micro-climate. At Ballachuan there is a marked gradation from stunted, wind-pruned hazel which form a low, dense thicket no more than a metre or two in height at the exposed south-western end of the reserve, to the tall hazel which grow three to four metres high on the sheltered east-facing slopes.

The most persuasive argument against a history of coupe-felling is the existence of so many lichen species which are known to require the particular ecological niches provided by Atlantic hazelwoods and also require long periods of ecological continuity.

It seems probable that hazel was harvested on an 'ad-hoc' basis, selected stems taken as needed from allocated areas within the woodland. In the 1990 coppicing experiment mentioned above, coppice re-growth has been slow with un-browsed stems now only c. 1.5 to 2m. in height (Figure 39), a rate of growth far slower than

would be expected in similar circumstances further inland. This suggests that coupe-felling would not be an effective way of encouraging suitable stems for harvesting, and that such stems are more likely to come from stools that were retained within a hazel canopy.

3.3.4 The Beech Trees

Beech trees are a prominent feature of Ballachuan. These trees were planted, probably in the 19th century as a landscape feature. At that time, the area was part of the Breadlabane Estate and Ardmaddy Castle was used as a summer residence by the Marquis of Breadalbane (New Statistical Account, 1845 pp 74.). It is probable that these trees were planted to be seen from the castle. All the large, old trees are on or just below the ridge opposite Ardmaddy Castle (Figures 37 and 38) and would have been highly visible from there.

The archaeological survey suggests that the ground where these trees were planted was cleared of boulders and was open ground at the time of planting. Some of these trees appear to be 'bundle planted', i.e. a group of saplings would have been planted in the same hole in order to make an impact in the shortest possible time.

The beech are the only obviously planted trees on the reserve. All other trees are of native species. It is possible that other trees were planted but there is now no easy way of determining this.

3.3 5 Changes in Woodland Extent

Though ecological evidence suggests that Ballachuan has been wooded for a very long time, the pattern of woodland cover must have changed many times over the years.

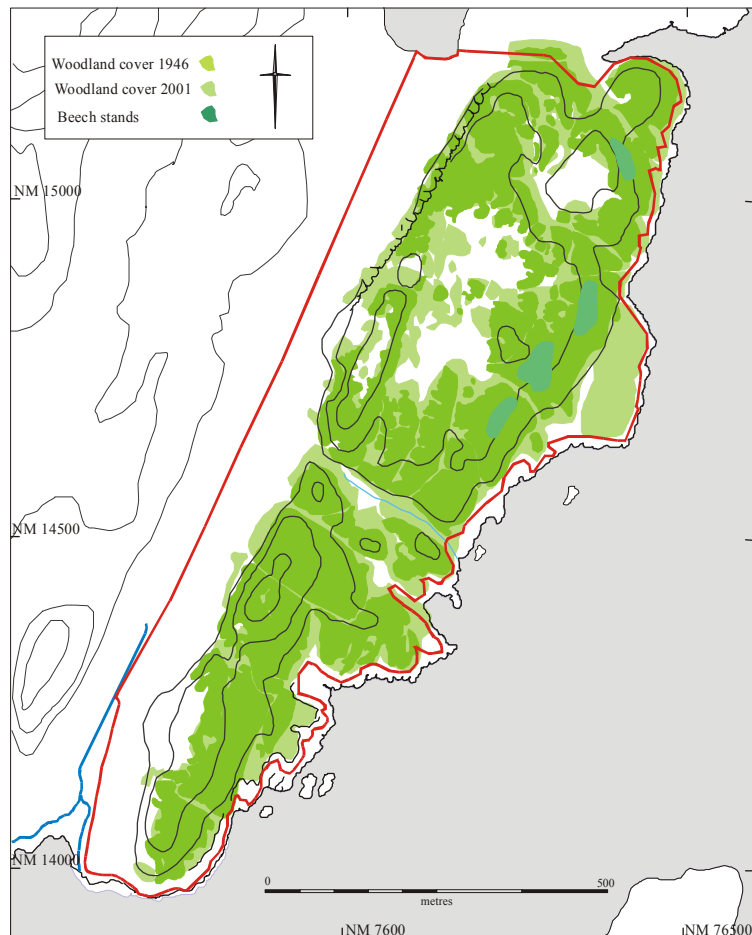


Figure 36. Ballachuan Wooded Areas

Early maps such as the Blaeu Atlas of 1654 to the 1871 first edition Ordnance Survey do not show woodland. However, this is no proof that woodland was not there. The 1900 second edition Ordnance Survey map shows woodland with a similar distribution to that found today.

We have detailed information on woodland cover that dates back to 1946 when the first aerial photos were taken. These are tremendously informative photographs and from them we can see that the hazel-dominant areas have changed little over nearly 60 years.

Comparing the 1946 aerial photo with the 2001 photo (Figure 36), we can see that woodland cover is significantly greater in the latter. This is due to the infilling of previously open ground with birch and willow on Rhubha na Moine (Figure 41) and the spread of birch, willow, hawthorn and blackthorn on the edges of hazel stands.

Figure 36 clearly shows:

- Some settlement remains are now within the woodland area. This may indicate woodland expansion after the settlements were abandoned or it may indicate that the structures lay within the woodland themselves. The former is more likely as most of the structures also had tree growth on the walls or within the buildings. Certainly the lichen survey does not suggest that the areas of

woodland holding the remains of structures are poorer in species requiring ecological continuity than the rest of the woodland.

- The rides that were probably cut and maintained to give access to people harvesting hazel wands (Figure 38). Thompson (1985) recalls that “*There were paths through the wood and presumably these would have been regularly tidied-up. Such work would have been greatly helped by the cattle which were run in the wood each winter.*” Coppicing finally ceased at about the time that this first photo was taken. Since then some of these rides have begun to fill in, usually with species other than hazel. A few have been maintained as paths over the last 20 years by SWT.

3.3.6 Recent History

Woodland regeneration was localised when SWT bought the woodland in 1985, mainly confined to the birch and willow of Rhudha na Moine. At that time, all stock were removed and regeneration accelerated. Deer browsing has continued and deer numbers are variable but at times high (up to 12 beasts over an areas of c. 50 ha.). Deer have a significant impact on the woodland field layer, as well as on seedling tree regeneration, as can be seen by comparing the rank vegetation within two deer-fenced enclosures with the vegetation immediately outside.

Young hazel shoots on existing stools are quite frequent, even on hazel now in an area seasonally grazed by small numbers of cattle. seedling hazel are frequent in places. Seed is abundant some years, scarce in others, but hazel saplings and young trees are very scarce, with seedlings usually succumbing to deer browsing pressure and, within existing woodland, to competition from larger trees.



Figure 37 The interior of one of the areas of mature beech, showing bundle planted beech. Ardmaddy castle, once the summer residence of the Marquis of Breadalbane, is visible in the distance.



Figure 38. A ride within the hazel woodland, probably established as access for collectors of hazelwands. This ride has closed over with hazel, others have regenerated with birch, willow or blackthorn



Figure 39. Hazel stools coppiced in 1990 and protected from browsing deer. The stems in this experimental plot are sturdy but would make poor wands. The mossy patch in the foreground is a mound of rotten hazel, all that remains of a 'cord, of hazel stems, i.e. a stack measuring 8' x 4' x 4'.



Figure 40. a mature hazel stool with abundant *Lobarion* lichens on older stems. Young stems are abundant and some would eventually replace ageing stems



Figure 41. 20th century woodland expansion on Rhuba na Moine. This regeneration is of downy birch and eared/grey willows. Hazel regeneration is scarce.

4. Historical and Archive Material

4.1 Historical Notes

The earliest history of Seil appears to have been bound up with the fortunes and vagaries of the Lords of the Isles, as was much of the western seaboard of Argyll. As such, much of the historical sources relating to the Reserve concentrate on who and what, was seen as important at the time; the Kings, Lords, High Clerics and politics of the period. Very little mention was made of a small settlement located on the southern tip of Seil prior to the 16th century. Therefore documentation from later periods must be relied upon to colour our historical understanding.

The parish of Kilbrandon appears to have been part of the Ardchattan Priory lands, although the McDougalls in various forms held sway over Seil up until the early 17th century. From then Ballachuan, along with much of the rest of Seil became part of the extensive lands belonging to the Campbells of Breadalbane. It is from their Estate records that much historical information has been gleaned

4.2 Cartographic Sources.

Several maps of Argyll were studied, and those useful to the survey are listed below. As the maps are subject to copyright they can not be reproduced here.¹

1654. Blaeu Atlas of Scotland (National Library of Scotland. Amsterdam; Blaeu 1654

1734. J (John) Cowley. (National Library of Scotland EMS.s.736(16))

1745 Herman Moll. (National Library of Scotland. EMS.b.2.1(17))

Roy's map c1750. Military Survey of Scotland (original in the British Museum)

1750 James Dorret (National Library of Scotland EMS.s.640)

1786 A. Hogg (National Library of Scotland. EMS.s.192)

1799 Robert Scott (National Library of Scotland. EMS.p.23)

1801 George Langlands. (National Library of Scotland. EMS:s.326)

1834 John Thompson. (National Library of Scotland. EMS.s. 712(17))

1883 Ordnance Survey 6" First Edition. Sheet CXXI.

2003 Ordnance Survey 1:25,000 NM 71

¹ Most of these maps can be viewed at the National Library of Scotland in Edinburgh, or on their website: www.nls.uk/maps/

The most interesting cartographic source relating to Seil is to be found within Blaeus' 1654 Atlas of Scotland, since it may show the earliest representation of the settlement at Ballachuan. A settlement named 'Balechon seil' is located on the south-eastern tip of Seil, which geographically fits the location of the settlement within the Reserve. The map also shows other identifiable settlements on Seil, these more or less geographically accurate: from Balechon (Ballachuan) at the south, and moving northwards and round the coast to Balviccan (Balvicar), Kilbrennen (the church of Kilbrandon), Oban (Oban Seil), Kamezlaich (Camuslaich), Kanbain (Cairnban) and Dunmoir (Dunmore). The only place now unidentifiable from the map is shown north of Ballachuan, Kiluria? As this name contains a 'Kil' element, it very probably represents the unnamed chapel located north of Ballachuan Loch (Site 8). Another point worth bearing in mind is that much of the information within the Atlas was drawn from earlier work, most from manuscripts compiled prior to 1654. Much of this work was undertaken by Timothy Pont in the 1580s-1590s, with additional work by James Gordon in the 1630s-1640s.

Further cartographic evidence is found in Hermann Moll's 1745 map of 'Argyle'. The representation of Seil bears a striking resemblance to that in the Blaeu Atlas, and, if the spelling is anything to go by, appears to have been copied with the place names misrepresented. Here 'Balechon' has become 'Baechon' with 'Kilbrennan' now 'Kilrenan', although both are shown in geographically similar positions to the 1654 map.

Roy's military map of c1750 unfortunately only covers part of the eastern seaboard of Seil, and does not include the reserve. However, the gap in the chronological sequence is somewhat stemmed by James Dorrets' map of 1750. While Seil is not shown in great detail, 'Balechaun' is represented and perhaps importantly is now seen as lying more to the west of the southern tip of Seil. However, as Balvicar is shown as also lying on the western side of Seil, then this representation must be treated with caution.

Possibly to be treated with more credulity is the 1801 map produced by George Langlands. This map also shows 'Ballachahuan', again appearing to lie in a more westerly position within this part of Seil. The map also indicates that mention of 'Ballachahuan' refers to a farmhouse rather than a settlement *per se*. The farm is shown to lie west of the road between Balvicar (Balliviar) and Cuan (Couan); this now possibly existing as a ferry. Two things are then suggested from this map; firstly, any settlement may no longer have existed in 1801. Secondly, the name of the settlement, or the area previously occupied by the settlement, had been transferred to a farm holding. Other possibilities of course exist, but the building or farm now referred to as 'Ballachaharn', while preserving the name no longer demonstrates its geographical nomenclature, as being the 'settlement by the sea'.

A similar picture is given of the southern part of Seil in Thomsons' 1834 Atlas of Scotland with one exception; in this map, the kirk erected at Cuan in 1735 is shown. None of the above maps, nor the earliest editions of the Ordnance Survey show the

detail of areas of land use or woodland cover, but perhaps not surprising since depicting vegetation was not the objective of the producers of these early maps.

4.3 Sasines

Sasines detail the transfer of land and buildings, usually through sale or inheritance. In Scotland full register begins in 1617 and is very useful in establishing land ownership at any one time, but less illuminating as to who actually lived and worked there since it does not list rentals. Luckily most of the 17th century sasines for Argyll were transcribed from the original Latin by Herbert Campbell, making it a relatively easy task to browse the record of land ownership in this area.

Ballachuan fortunately makes an early appearance, as in 1617 the ‘4 merkland of Ballichuan in Seyle’ passes from ‘Duncan McDougall of Scammadale’ to ‘Mr Donald Campbell of Barbreck-Lochow’, later Sir Donald Campbell Baronet of Ardnamurchan. In doing so ‘Ballechaun’, as much of the rest of Seil, now passes into the Breadalbane estates. ‘Ballechuan’ stays within Campbell hands and is mentioned in a sasine of 1654.

In a sasine of 1658 there is particular mention of ‘Balleqchowane in Seyll’ as sold by ‘Argyll and Lord Niall Campbell’ to ‘Hector Mclean of Torloysk and his wife, Catherine Campbell and their 2nd lawful son John Mclean, on a sale charter by Argyll and the Lord Niall Campbell in favour of said Hector and Catherine in liferent and said John in fee’. This is the last time Ballachuan is mentioned in the 17th century. Time precluded detailed investigation into the 18th and 19th century sasines, although as we shall see below, rents are still being collected from Ballachuan on behalf of the Breadalbanes’ into these later periods suggesting the land reverted back to their direct control.

4.4 The Breadalbane Collection

The breaking up of the Breadalbane Estate in 1926 meant that thousands of documents relating to the Estate came into the hands of the National Archive of Scotland. These documents number some 83,000 thus only a limited survey of some of the earliest documents was possible, however, some of those studied made direct mention of Ballachuan.

4.4.1 Tacks

Within a bundle of 17th century ‘Tacks of Nether Lorne Set by Lord Neil Campbell’ a Tack of 1674 survives that is “...to Mr John Duncansone, minister of Kilbrannane, of one merkland of Balichuane seil, with house where he now lives, an ‘in regaird the said Mr Johne is putt to some charges for furnishing the mansione house with beds and pupall-walls and a meal-garner therefore the said noble lord does hereby oblige himself and his heirs to pay the money for these and other things of lyke nature...”

A second tack dating from 1686 is “...to Dougall McDugall in Balechuan in Loyng, of the ferry of the Quoan with crofts belonging thereto and grazing for four cows in Balechuan in Loyng, and 10 sheeps grazing in Balichuan in Seill, for 7 years.”

The first document suggests that the minister for the Parish is at least being housed by the Braedalbanes while the second document indicates that at least part of the land at Ballachuan has now come under sheep.

4.4.2 Estate Rentals

Several rentals rolls exist for the Earl, later the Marquis of Breadalbanes' estate in Nether Lorn, which included Seil. The chronological coverage is patchy but several make mention of a Ballachuan in the 18th and 19th centuries, albeit under different spellings.

The earliest mention is dated 1671 for "*The sett of Lord Neil Campbells lands from Whitsunday 1671 to Whitsunday 1672...*" Within it there is no mention of Ballechuan on Seil but only of 'Ballichowan Loyng', presumably a different settlement on Luing. Why Ballachuan on Seil does not appear on the rental roll begs the question about its survival as a settlement within this period.

By 1730, however, there is mention of a 'Ballichuann Saol', this rented to a 'Mr James Campbele', minister of Kilbrandon at 120 days money rent at £410.

Ballachaun appears listed within a 1788 the 'Rental of Crofts on the Island of Seil'

Clachadow or Oban Croft
Achnaclach Croft
Kilbride Croft
Ferry of Cuan and Croft
Ballachaun Seil with minister at £36,4,2
Kilbride, lately divided into 3
Ballavicar, divided into 14 crofts and enclosed

It would appear by this time that the land at Ballachuan had been consolidated into one holding or farm, as no other crofts are mentioned. This larger holding it appears was farmed by or on behalf of the minister. This borne out by the agricultural survey of 1796 (see below). This states that the land had previously been rented as one by the Rev Stewart, but by 1796 was now rented in two divisions, by the minister John McFarlane and one Mr Campbell of Easdale (both of whom appear in the 1798 rental cited below).

By 1798, the rentals indeed show that Ballachuan had been divided into two parts, the western division rented to Archibald Campbell at £43.6, while the north division was rented to Mr M; McFarlane at £53.17,4. The land is rented at the same price in 1800 and 1802 with Archibald Campbell still within the west division, while another McFarlane, John, farmed the northern part.

In 1807 only one tenant appears on the rental rolls for Ballachuan, Alexander McFarlane with a rent of £220, suggesting the two holdings had again been combined and perhaps expanded with improvements such as drainage.

The rentals and payments of the Breadalbane estate in 1815 mention improvements such as the building of dykes and drainage programmes on Seil although few of these projects are geographically specific. However, the fact they are mentioned suggests a wider programme of land improvement being adopted by the Estate, possibly reflected in higher rents.

Between 1817 and 1824 a list of tenants are provided although these rents are not listed as crofts.

1817 and 1821		1824	
Duncan Greham	£150	Duncan Greham	£150
Joseph McIntyre	£75	Joseph McIntyre	£75
Ducnan Johstone	£75	Duncan Johstone	£75
Neil Brown	£19	Neil Brown	£19
John Connel	£19	A.V.L Connel	£19
John Anderson	£6	John Anderson	£6
Angus Mckay	£6	Angus Mckay	£6
Ferry croft Angus McInnes	£23	House, capt Mcinnes	£6
		Ferry croft Angus McInnes	£23

In 1834, rather confusingly, there are two separate entries, these a) 'Balachuan' and b) 'Balechuan'.

a) 'Balachuan' appears to be rented out to some of the same tenants from 1824.

Captain D MacDougal	£110
Joseph Mcintyre	£80
Rev Robert Calder	£15
McGoug..il	£30
Neil Brown	£15
Archibald Connel	£15
John Anderson	£6
Duncan McKay	£6

and a ferry craft to Duncan McAndrew £30

b) The second 'Balechuan' is in turn rented in 3 parts

Donald Carmichael	£52.10
D.V.b? McQueen	£52.10
Angus McInnis	£8

The fact that a ferry boat is listed amongst the rents possibly suggests that some of the rents refer to land holding around Cuan although it is difficult to be sure.

The last rental records examined date to 1854, here again there are two entries under the name of Ballachuan.

a) Ballachuan

Misses Mcpherson	£20.11.6
Duncan Mc ?..huan	£181.39

b) Ballachuan

Dugald McDougal	£38
Donald Wemes?	£6.16
Alex Henderson	£5

Apart from the ferry croft no other croft holdings are specifically mentioned within the rentals, although croft holdings are mentioned as such within other parts of Seil. We have to assume then, that the land is being rented as some other form of tenure, possibly for grazing sheep or cattle, although without specific mention of agricultural practices it is difficult to be sure.

4.4.3 Agricultural Survey

In 1796 an 'Agricultural survey of the Earl of Breadalbanes Estate in Nether Lorn' was undertaken by Robertson. In this document Robertson again refers to two places called Ballachuan. The first is a 'croft house and ferry of Ballachuan' this rented by a John Anderson a 'mason from Taymoth'. Anderson seems to have formerly managed a lime kiln but 'now keeps ferry boats'. This would certainly suggest that this holding was located at the present Cuan, and as mentioned above may similarly explain the presence of two Ballachuan in the later rentals. The croft apparently was part of the larger farm of Ballachuan, 'the whole croft 10 acres arable and pasture'

The second Ballachuan mentioned within the Robertsons' survey appears to be a farmstead divided into two divisions – "*...greater to Mr MacFarlane the minister...(and his father in law Rev Stewart had the whole)..raising red clover*" - this crop apparently attracting a premium from the Board of Agriculture. The minister had also "*tried drilled potatoes and lime and sea shells*". The lesser part of the farm was held by Mr Campbell of Easdale, although less detail is provided about his activities.

4.5 Statistical Account

This entry in the Account was made by the minister for the parish the Rev. John MacFarlane, who appears in Robertsons' 1796 survey. He makes several observations that may be of relevant interest to Ballachuan itself. While there is no manse at this time, the 'Lord Breadalbane accommodates the minister with a house' this the farm at Ballachuan. He also notes that one of the greatest complaints amongst the people of the parish 'is the dearth and scarcity of fuel' which had to be purchased from neighbouring farmers. This possibly indicates that if hazel wood existed at this time, its resource, the coppiced wood, may have been protected by the Estate and/or its crop was used elsewhere.

The Account also makes mention of mineral prospecting where '...by several experiments made some years ago, by Mr Rasp the mineralist, veins of lead and silver

ore, and likewise iron, zinc; copper and copperas, were discovered on Lord Bredalbanes property in this parish; but not in sufficient quantity to encourage the expense of manufacturing'. This may well account for some of the small quarries located within the wood.

4.6 Aerial Photographs.

All aerial photographs of the Reserve held by the Scottish Wildlife Trust were scanned for evidence of past activity. These were particularly useful in plotting former systems of rig and furrow cultivation, the majority no longer apparent on the ground. Of all the photographs scanned the 1946 set were the most useful in establishing the rig and furrow systems, which become less obvious through time. The later photographs however were useful within the woodland survey in indicating the rate growth of tree cover between 1946 and 2001 as is described above.

Photographs examined

Print No.	Flight No.	date.
3262	1066/scot/uk/49 RP.PT2.	6/5/46
3263	1066/scot/uk/49 RP.PT2.	6/5/46
3264	1066/scot/uk/49 RP.PT2.	6/5/46
271	OS/68/183V.	12/6/68
272	OS/68/183V.	12/6/68
51088231	JAS Air 1: 24,000	9/6/88
51088232	JAS Air 1: 24,000	9/6/88
21 (4)	Film 371/01 1: 20,000	18/9/01
22 (4)	Film 371/01 1: 20,000	18/9/01

5. Archaeological and Historical Discussion

The findings of the survey somewhat confirm the findings of the work previously undertaken by the Lorne Antiquarian and Historical Society, in that the ridge now occupied by the Reserve had been intensely utilised in the past (Campbell 1985). This was apparent with both the remnants of structures and an extensive layout of fields. The bulk of the structures appear to be located along the east-facing slope of the ridge overlooking the flatter plateau area within the northern central part of the Reserve. One possibly important exception to this was the probable group of structures located on the highest point at the southern tip of the ridge (Structure/s 64). These remains and their position, do not sit comfortably within the Medieval or later periods. What they represent, however, is another matter, although if prehistoric or Iron Age then their future management becomes crucial.

The bulk of the buildings within the main settlement core, were probably deliberately located away from potential growing areas, the later occupying the more even or free draining ground. The use of the more even ground was seen with the extensive pattern of rig and furrow cultivation scarring the site. Much of this pattern was evidenced from the 1946 aerial photographs. The majority of the rig and furrow now

appears to have disappeared due to subsequent vegetation growth and areas heavily disturbed by cattle, although patterns are still visible in a few areas of the Reserve.

The walkover survey also revealed that many areas within the wood itself, hidden from photographic coverage, may have been used as cultivation terraces. These generally appeared as cleared more even ground, most with piles of cleared stones or clearance cairns on adjacent, less agriculturally suitable ground.

While the presence of rig and furrow certainly suggests the growing of crops, the status of the buildings *vis a vis* the field patterns remains unclear. However, the number of buildings and their proximity to the fields suggests fields and buildings are intricately linked and are likely contemporary. If contemporary, it would seem unlikely that the buildings were used as animal pens, given most of the land on the plateau appears to have been given over to arable cultivation. This would tend to suggest many of the buildings were domestic in nature and that these formed part of the larger settlement.

The dating of the fields, as with the buildings, is of course problematic given the lack of any diagnostic evidence - which is, of course, generally the case following walk over surveys. Rig and furrow cultivation has a long use life and could span any period between and the Medieval and the 19th century. While we can perhaps better explain the later processes of agrarian change which affected Ballachuan from the middle of the 18th century, much less can be said about the settlement revealed within survey. A late date for the majority of the buildings can probably be discounted since no settlement or remnants of thereof, are shown on the 1st Edition Ordnance survey in 1883.

Despite this, Ballachuan certainly existed as a place by the early 17th century, as evidenced by the Blaeu Atlas, and consistently within other maps thereafter. The later maps however, appear to show the westward movement of the named settlement over time, if of course their geographical accuracy can be trusted. By possibly 1754 and certainly by 1801 the maps indicate that 'Ballechuan' has been consolidated into one farm, where the present Ballachuan farm now exists. Indeed it is likely that the current farm building is the one which appears on Langlands map of 1801.

The bulk of the buildings found within the survey are then likely to date to before the mid to late 18th century. This is hardly surprising given that few of the structures fit the traditional rectangular house of the south west highlands in the later 18th and 19th centuries (RCAHMS, 1975; Grant, 1995). With one exception all structures within the reserve tend to be smaller an/or squarer in plan. So, exactly how early might these structures be? It is of course, impossible to say without excavation, however, it is possible to speculate that these might be Medieval, Medieval remains at Ballachuan are possible, these may underlie the present upstanding features or be buried under the present ground surface. The time span of this settlements existence is another crucial question. It is possible to speculate that the property may have been consolidated into a single farm by 1730 as only one tenant, James Campbell, is listed as paying rent at this time. This perhaps suggests the older settlement no longer existed.

The late 17th century was one of acute political and religious turmoil for many parts of the highlands. The consolidation of property or the decline of the settlement may be

the result of this political and/or social upheaval. However, without more study into the minutia of the history of this part of the western highlands the reason/s for the settlements decline are impossible to elucidate further at this stage.

Outside of political forces, the changing agrarian world from the mid 18th century onwards led to a dramatic decline in the traditional highland township or *baile*, based on groups of tenant farmers and cottars. Over time the tendency was for lands to be consolidated into larger single tenant farms or single tenant crofts. This is perhaps the case at Ballachuan. The Breadalbane estate was a prime instigator of agrarian change, exploiting their lands to reap the rewards of increasing prices for cattle and wool. This in turn, leading to improvements of drainage and enclosure and as a result, different systems of land tenure. This consolidation of the farm holding is reiterated within the agricultural survey undertaken by Robertson in 1796, who indicates that the property had become one and had previously been farmed by the minister Rev. Stewart.

As only one croft is mentioned within Ballachuan from the rentals of early 19th century, the 'ferry croft', one has to assume that no other crofts existed within this part of the estate. Land appears to have been rented to individuals, who farming the land as graziers or growers, but were not actually occupying it. Possibly they resided in nearby communities such as Cuan or Balvicar.

The survival of the hazel wood in these circumstances suggest that the woods may have been actively protected, from animal and human predation, by the inhabitants of the earlier settlement, thus it must have been considered a viable and possibly valuable resource. The flourishing of the wood, however, may date to the period after direct settlement of the Reserve. It is possible that the woodland, as with other policies within the Breadalbane Estate, was exploited more commercially with the woodland being partially enclosed with walls and ditches, keeping out both hungry livestock and the fuel lacking inhabitants of Seil. The possibility that such a resource was valuable in the slate industry should also be taken into account.

6. Recommendations and Suggestions

6.1 Recommendation for Further Archaeological Work and Historical Research

If the chronological sequence of the earlier settlements history is to be understood, further work is required. Additional documentary research into the early ownership and exploitation of the land would help to clarify the earlier picture of land use. Excavation is necessary if the true age, chronological sequence and nature of the structures within the settlement are to be understood. At present it is not envisaged that any mature tree growth should be cut back in order to protect the buildings, although if excavation uncovers buildings of importance or early date this recommendation may change.

Recommendations include:

- Closer study of the Breadalbane Collection and other relevant documents contained within the National Archives of Scotland.
- Sample excavation of targeted structures within the Reserve. This would

entail small scale investigation in order to establish the age and preservation of the archaeological resource.

- Four structures in particular warrant further investigation: these being Structure **6a**, Structure **58**, Structure **3a** and Structure/s **64**. Structure **6a** and Structure **58**, are the most intact remains, thus they may have been present at the end of the settlement. In contrast Structure **3a** being in a degraded state may indicate earlier activity. As mentioned above Structure/s **64** are located on the height of the ridge and this in itself may indicate early, possibly Iron Age or Medieval activity.
- Further survey work would establish a more comprehensive picture of the settlement and its landscape setting. This would involve the creation of a landscape model using an EDM and Geographic Information System (GIS) such as ArcView.
- Much of the above work could be carried out within a longer term programme for the Reserve that closely, if not primarily, involved members of the Lorn Archaeological and Historical Society with appropriate professional supervision.

6.2 Suggestions for Further Woodland History Research

Further research is needed in order to establish the history of the hazelwood. Some of this would be fairly straightforward and inexpensive, other research would be specialised and consequently expensive. The woodland is of sufficient ecological importance to justify consideration of this research.

Options include:

- Peat core sampling and analysis to establish the relative abundance of hazel through post-glacial time. Peat-cores have been taken at Tainish, Oban and on Mull (Birks 1989, Tipping, Long & Watson, 1999) which give us the broad-brush picture but as far as this author is aware, no samples have been taken sufficiently close to Ballachuan to establish a woodland time-line for this area.
- An expansion of the hazel and BAP lower plant species monitoring started by Black and Coppins & Coppins. A costed proposal for monitoring was written by Sandy Coppins in 2001.
- Further research into genetic links between hazel stools, based on the Gulliver model. Approached in a holistic manner, further archaeological, historical and woodland history research could result in both strands informing each other to produce a more in-depth picture of the human and ecological interaction which has resulted in the reserve being as it is today. This research could be used to produce a published monograph and interpretive material which would enhance the experience of visiting the Reserve and contribute to its continued survival.

7. Site Gazetteer

- 1 (NM 754 143) Flint scraper. Cuan Ferry, Seil. Surface find.
- 2 (NM 751 146) Possible cairn. Oval in shape, measuring 10m x 7m, situated on raised beach.
- 3 (NM 771 164) Fort. Balvicar, Seil. Situated SE of Balvicar village on rocky ridge. The Fort measures 93m by 43m with outworks to the south and north, part of which are vitrified. The remains of the walls stand no higher than 1m in height. (RCAHMS. 1975, No 125)
- 4 (NM 756 163) Fort. Cnoc an Tighe Mhoir. Seil. Situated on a ridge south of Kilbride farmhouse. The fort measures 43m by 25m with the wall line, surviving as a stone and earth bank, standing to a height of between 1m-2m. (RCAHMS. 1975, No 128)
- 5 (NM 747 171) Dun. Dun Aorain. Situated west of Dunmore House on a rocky promontory. Sub oval in shape measuring 17m by 12m and constructed in local slate with the walls standing to 3.3m high in places. (RCAHMS. 1975, No 166)
- 6 (NM 7515 1541) Dun. Dun Mucaig. Situated NE of an inlet known as Port nam Faoileann ion a prominent rock stack. Built of local slate the dun measures 14.6m by 7m, the walls standing to a height of 2.4m. (RCAHMS. 1975, No 179)
- 7 (NM 763 166) Old Parish Church. Kilbrandon. Seil. Medieval-17th century. Parish church united with the parish of Kilchattan sometime in the early 17th century. (RCAHMS. 1975, No 252)
- 8 (NM 7622 1539) Chapel and burial ground. Ballachuan. Medieval? remains of small chapel on a grass/rock knoll north of Ballachuan Loch. The building measures 5.7m by 2.7m-3.2m and is constructed of rubble and slate bonded with clay. The sub rectangular burial enclosure is at the north and measures 10.7m by 5.5m. (RCAHMS. 1975, No 221)
- 9 (NM 7541 1438) Old Parish Church. Kilbrandon and Kilchattan. Seil. Between 1735-1864 parish church served as parish church. Thereafter converted into an isolation hospital in the 1890's. Now the private residence called Dunfillan House. (RCAHMS. 1975, NO 251)
- 10 (NM 7578 1553) Kilbrandon Church. Seil. 1864-present. Parish church.
- 11 (NM 766 154) Kilbrandon House. Seil. Built in 1827 to serve as manse for parish of Kilbrandon and Kilchattan. Now a private residence. (RCAHMS. 1975, No 325)
- 12 (NM 7628 1515) Field System. Even cleared area now situated within trees, possibly related to building/s 13.
- 13a (NM 7624 1513) Building.
- 13b (NM 7624 1513) Building
- 13c (NM 7624 1513) Building
- 13d (NM 7624 1513) Possible building
- 13e (NM 7624 1513) Probable building
- 14 (NM 7622 1508) Cleared ground. Now situated amongst trees, probably agricultural terraces.
- 15 (NM 7624 1507) Cleared terrace. On eastern slope of ridge above plateau area, now in trees.
- 16a (NM 7624 1505) Building.
- 16b (NM 7624 1505) Building

- 16c** (NM 7624 1505) Wall. Length of collapsed rubble built wall running NE from structure 16b
- 16d** (NM 7624 1505) Upright stone. Possibly just a displaced natural rock, its position near structures 16a-b warranted noting.
- 16e** (NM 7624 1505) Possible building.
- 17** (NM 7626 1510) Building.
- 18** (NM 7626 1510) Cleared ground. Possible narrow strip field now within woods.
- 19** (NM 7630 1518) Field/trackway. Cleared area/field lying situated in natural valley running west from plateau area and structure group 16. Clearance cairns also dot this now wooded area.
- 20** (NM 7629 1507) Possible building.
- 21** (NM 7630 1505) Rig and furrow. Area within fenced plateau area where rig and furrow runs are still visible as clear N/S running strips.
- 22** (NM 7625 1502) Building
- 23** (NM 7623 1502) Field/clearance cairn. One of many cairns dotted throughout the field systems. Measures 3m in diameter and stands to 1.20m high.
- 24** (NM 7623 1500) Cleared area/possible field. Possible agricultural terrace/strip field.
- 25** (NM 7621 1502) Cleared way. Possible agricultural terrace/strip field.
- 26** (NM 7617 1505) Wall. Linear N/S alignment of stones that form possible wall line. Situated along upper slope of ridge within now wooded area. If this is a wall no return or opposing sides could now be traced.
- 27** (NM 7620 1560) Building.
- 28** (NM 7616 1499) Structure.
- 29** (NM 7616 1497) Buildings.
- 30** (NM 7612 1491) Building.
- 31** (NM 7601 1480) Track-way. This track enters the Reserve from Ballachau farm and proceeds up the western slope of the ridge. The track appears then to split at a level cleared, which may have been utilised as a field. Part of the track continues to the north and up onto the ridge through a natural break in the ridge escarpment, the other part taking a more direct route to the top of the ridge.
- 32** (NM 7638 1507) Cleared/level area.. Now lies within the trees this area runs east from an open area.
- 33** (NM 7640 1505) Cleared/level area and Beech stance. Mature Beech trees occupy this area of generally even and cleared ground, which may be agricultural terraces prior to planting of the trees.
- 34** (NM 7642 1509) Cleared area. Open even area at the base of the east facing slope of the ridge, possibly utilised as a field although damp ground exists to the extreme east of this area.
- 35a** (NM 7640 1498) Building.
- 35b** (NM 7640 1498) Quarry. Small quarry cut into S/E facing rock outcrop. Situated within wooded area and lying 8.7m N/E from building 35a, the quarry has a mound of spoil around the mouth.

- 36** (NM 7638 1492) Cleared/level area and Beech stance. Another possible agricultural terrace prior to the Beech plantation.
- 37** (NM 7643 1483) Clearance cairns.
- 38** (NM 7639 1483) Cleared area/field. Field now partially in trees.
- 39** (NM 7629 1491) Rig and furrow. Area within fenced and grazed area where rig and furrow cultivation can still be discerned.
- 40** (NM 7625 1477) Cleared/level area and Beech stand.
- 41** (NM 7632 1465) Lead Quarry. Located at the coast on Seil Sound this strip mine measures 17.5m long from the entrance and is 2.50m wide at its widest point. It is 2.20m deep.
- 42** (NM 7618 1484) Building
- 43** (NM 7617 1486) Wall. Aligned E/W this wall runs across the top of a rocky wooded outcrop for 25-26m and stands at a maximum height of 0.42m. The wall is rubble built and may be associated with structures 42 and 44, no return or opposing sides are now apparent.
- 44** (NM 7617 1483) Possible building.
- 45** (NM 7617 1483) Building.
- 46** (NM 7614 1482) Possible building?
- 47** (NM 7615 1472) Wall. Aligned NW/SE, running along valley base between the northern and southern parts of the Reserve. One of the best preserved stretches measured 0.80m in width and stood to a height of 1.05m in four courses with larger stone blocks used in the base. An associated? ditch runs along its southern side.
- 48** (NM 7616 1466) Trackway? Possible field or track running east towards Seil Sound utilising a natural valley.
- 49** (NM 7613 1442) Jetty. Roughly made of beach cleared stones measuring 2.90m by 6.50m. The landward end of the jetty uses larger stones although the drystone technique used throughout appears fairly rough. A smaller heap of clearance stones also exists at the eastern end of the jetty.
- 50** (NM 7615 1445) Wall. As with wall 47 this wall is also aligned NW/SE running along valley base between the northern and southern parts of the Reserve, except in this case the wall hugs the foot of the northern slope of the valley. Built of rubble and roughly coursed it stands to a height 1.15m.
- 51** (NM 7622 1423) Trackway. Remnants of more level area running along the valley floor south of walls 47 and 50.
- 52** (NM 7600 1454) Spring. Situated at the valley base between the northern and southern parts of the Reserve, continues to the S/E as a small burn.
- 53** (NM 7608 1449) Possible building.
- 54** (NM 7588 1418) Cleared area. Possible former field area now in tree cover.
- 55** (NM 7590 1446) Possible wall. Line of stones possibly representing a structure.
- 56** (NM 7585 1429) Terraced platform. Situated on the wooded eastern slope of the ridge this cleared and more even ground appears to have been utilised as an agricultural terrace.
- 57** (NM 7629 1493) Building and wall.

- 58** (NM 7615 1488) Building.
- 59** (NM 7590 1415) Cleared area. Area possibly used as a field.
- 60** (NM 7586 1426) Cleared area with clearance cairns. Situated in a wooded area on the eastern slope of the ridge, previously appears to have been used for agricultural purposes.
- 61** (NM 7571 1355?) Spring. Small natural spring, possibly capped with two large stones. This lay at the southern end of the ridge, however, the GPS northing reading appears inaccurate.
- 62** (NM 7580 1417) Possible platform. Cleared even ground area a possible agricultural platform now in trees.
- 63** (NM 7585 1400) Boat slip. Area where larger stones/rocks have been cleared from foreshore of an natural inlet, this likely to enable easier access for a boat landing
- 64** (NM 7577 1425) Possible structures.
- 65** (NM 7561 1400) Slate quarry. Slag heaps and jetty.
- 66** (NM 7574 1422) Rig and furrow. Situated on cleared sloping ground at south western end of the Reserves ridge. Only apparent from aerial photographs as the ground is now covered with bracken.
- 67** (NM 7632 1509) Small Quarry. Cut into western face of rock outcrop at edge of wooded area, spoil still clearly seen.
- 68** (NM 7620 1525) Artificial cut to sea. Channel mainly 2-3m wide, linking Ballachuan Loch to the sea. This appears to be a widening of a natural outlet to the sea as drawn on George Langlands' 1801 map.
- 69** (NM 7618 1527) Wall. Remnants of curved wall, only larger basal stones seem to survive, the rest presumably robbed.
- 70** (NM 7618 1527) Wall. Small section of robbed out wall, similar in nature to wall 69. Aerial photographs hint that the wall line may have connected with wall 69 to the west.
- 71** (NM 7576 1552) Rig and furrow. Pattern of rig and furrow on east facing slope of hill mainly to the south and west of the present Kilbrandon Church, stretching almost as far as Cuan. Identified from aerial photographs.
- 72** (NM 7570 1463) Possible rig and furrow. Identified from aerial photographs.
- 73** (NM 7690 1474) Animal? Drinking trough. Sunken/wet area within plateau area of ridge, now covered in reed and grass.

8. Structural Descriptions

Structure 13a

The most substantial stretch of wall belonged to the north end of the building, being roughly coursed and standing to a height of 0.80m from the central part of internal space. A possible eastern stretch of wall also can be seen, other than that the building appears to have sat within a rectangular/artificial? Hollow measuring 10m by 6m.

Probable Structure 13b

This building was represented by two surviving wall lines on the west and south and a rectangular hollow measuring 6m by 4.5m.

Possible structures **13c**

This was represented by single line of wall and possible associated hollow measuring 4m by 5m

Possible Structure **13d**

As with **13c** this was represented by single line of wall and possible associated hollow that measured 4m by 5m.

Structure **13e**

This was a small rectangular structure measuring 7m by 4m and was represented by a surviving wall line on the south and a partially collapsed northern wall.

Structure **16a**

This appears to be a rectangular building measuring 6m by 4m and standing a maximum of five courses at 0.70m high the wall constructed from roughly coursed stones.

Structure **16b**

This was a sub oval structure measuring 5.5m by 4m and standing only a single course high at 0.20m.

Structure **17**

This was a square stone setting probably representing a structure measuring 4m by 4m. Currently this stands to a height of 0.80m

Probable Structure **20**

Consists of a partially collapsed wall line standing only one course high at 0.40m, with more collapsed? stone rubble to the north. These sit to two sides of a rectangular hollow measuring 11m by 3.5m.

Probable Structure **22**

A wall line possibly forming a third side to a rectangular natural rock formation, the internal space measuring 3m by 5m.

Structure **27**

Small rectangular building consisting of a collapsed rectangular collection of stones measuring 3.80m by 3.0m.

Structure **28**

This consisted of a small circular or rounded rectangular setting of stones. The structure may have been roofed as stones appear to have collapsed internally. Measures 3m across and stands 0.45m high.

Probable Structure **29**

The remains of rectangular structure measuring 4.60m by 3.5m. Roughly coursed wall on east, with other possible collapsed stones at south, these surround a flat, even rectangular area.

Structure **30**

Remains of rectangular structure with traces of surviving east, west and south walls. The building appears open at north end although built up collapse internally may be disguising any wall at this end. The surviving extent suggests a building measuring 7m by 3.5-4.0m.

Structure 35

A rectangular building utilising a natural escarpment as its western side. Northern and eastern walls survive best although the southern wall may survive under mass of collapsed rubble at this end of the building. The remains suggest a building measuring 6.5m by 3.5m.

Possible structure 42

Situated against a natural outcrop, a line of rubble or clearance may form the remains of a structure.

Possible structure 44

A small rectangular setting of rubble possibly forming a structure. Differs from numerous surrounding clearance cairns as the outer stones appear set on edge and the internal area is not mounded. Measures 3, by 2.5m and stands 0.50m high.

Probable Structure 45

A rectangular setting of rubble, with a possible entrance in northern side. The 'walls' stand to 0.36m high and suggest a building measuring 10m by 8m.

Possible structure 46

Piles of stones form a rough rectilinear pattern although breaks between the piles, hint these may no more than a collection of clearance cairns.

Structure 57

A rectangular building with entrance in northern wall. Remains suggest a structure measuring 5m by 4.5m with walls still standing 0.70m above the central internal area.

Structure 58

Rectangular building that appears open at its northern end. Surviving walls measure 6.5 by 5.5m standing to a height of 0.90m above the central internal area.

Structure/s 64

A possible group of structures situated at southern end of the ridge are represented by bracken and grass covered hollows and rises, some suggestive of circular structures. The pattern of possible buildings was by no means clear, as natural outcrops may account for some of the rises. However, one small localised investigation (i.e. pulling away the bracken and grass) did reveal a stretch walling, suggesting there are indeed structures present.

Bibliography

Anon. 1985. *First Ballachuan Hazelwood Management Plan*. Unpublished SWT document.

Birks, H.J.B. 1989. *Holocene Isochrone Maps and Patterns of Tree-spreading in the British Isles*. *Journal of Biogeography* 16: 503-540.

Black, B. 1999. *Ballachuan Hazelwood SWT Reserve: Survey of Hazel Vigour*. (Unpublished report for the Scottish Wildlife Trust).

Breadalbane Collection. Documents within the National Archives of Scotland:

Barcaldine in the Parish of Ardchattan, Argyll. GD112/2/24

Rentals of Breadalbane lands in Argyll 1629-1859. GD112/9/3/3

Minute Book of Tacks 1679-1689.
Tacks of Nether Lorne set by Lord Neil Campbell.

GD112/10/9
GD112/2/113/17

Campbell, D.A.F. 1985. *Ballachuan on Seil: The Ruined Settlement*. Lorne Archaeological and Historical Society Newsletter.

Campbell, H(ed). 1933. *Abstracts of the Particular and General Register of Sasines for Argyll, Bute and Dunbarton*.

Coppins, A.M. & B.J. Coppins. 1997. *Ballachuan Hazelwood Lichen Survey*. (Unpublished report for the Scottish Wildlife Trust).

Coppins, A.M. & B.J. Coppins. 2000. *Ballachuan Hazelwood Lichen Survey II*. (Unpublished report for Scottish Wildlife Trust).

Dye, J., et al. 2001. *The Sunart Oakwoods: a Report on their History and Archaeology*. (Sunart Oakwoods Research Group).

Fowler, J. 2002. *Landscapes and Lives. The Scottish Forest Through the Ages*. (Edinburgh, Canongate).

Gilbert, O.L. 1984. *Some Effects of Disturbance on the Lichen Flora of Oceanic Hazel Woodland*. *Lichenologist* 16 (1): 21-30.

Godwin, H. 1975 *The History of the British flora*. (Cambridge, Cambridge University Press).

Gulliver, S. 2002 *Spatial Patterns of Genotypic Diversity in Hazel*. Unpublished MSc. thesis for University of Edinburgh/Royal Botanic Garden, Edinburgh.

Hæggröm, C.A. 2000 *The Age and Size of Hazel (Corylus avellana L.) Stools of Nåtö Island, Åland Islands, SW Finland* in Agnoletti, M & Anderson, S. (Eds.) *Methods and approaches in Forest History* (CABI International).

The New Statistical Account of Scotland. 1845 (Vol. 7) (Edinburgh).

McVean, D.N 1964. History & Pattern of Scottish Vegetation: Pre-history and ecological history. In Burnett (ed.) *The Vegetation of Scotland*. (Oliver & Boyd).

Mosley, B. & G. Morison. 1998. *Ballachuan Hazelwood, Management Plan 1998-2003*. (Unpublished report for the Scottish Wildlife Trust).

Royal Commission on the Ancient and Historical Monuments of Scotland 1975. *Argyll, Volume 2, Lorn*. (Edinburgh, RCAHMS).

Ridley, H.N. 1930. *The Dispersal of Plants Throughout the World*. (Reed).

Thompson, A. 1985. Unpublished letter of recollections to the Scottish Wildlife Trust.

Tipping, R., Long, D. & Watson, F. 1999. *Holocene Woodland History of the Isle of Mull*. (Unpublished report for Scottish Natural Heritage).

Smout, T.C. (ed). 2003. *People and Woods in Scotland: A History*. (Edinburgh, Edinburgh University Press).

Statistical Account of Scotland. 1791-9. (Vol. VIII.) (Edinburgh).

