The Pinewoods and human use, 1600–1900

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Summary

Human use of the pinewoods in 1600–1900 is briefly reviewed, and related to evidence for differing woodland structure in these centuries. A certain number of pinewoods were lost between 1600 and 1800 and it is suggested that this may be related to climate change.

Human use

The native Scottish pinewoods have, since medieval times, been subject to several kinds of human use. They have in many cases been deer forests, reserved for elite hunters, and they have all been wood pastures, used by the farmers’ cattle, sheep, horses and goats. They have been a timber and fuel resource for local people, and the subject of exploitation by the external market. Only since the twentieth century have they been widely admired and visited by outsiders for their beauty, biodiversity and historic significance, though the roots of this admiration lie with the Victorians (Lambert, 1999). Each one of these uses has left its mark on the woods, along with the underlying effects of climate. Each one has also varied in character and impact with the changing centuries.

The use of the deer forest, for example, changed over time. Initially animals were driven by a circle of men (‘tinchel’) towards a funnelled enclosure (‘elrig’) where they could be killed by dogs and with weapons, but since the eighteenth century and particularly since the nineteenth century, the sport involved stalking on the open hill by one sportsman and his ghillie, and the woods were used only for sheltering the animals. We know nothing of the ecological impacts of the first phase, but the second was and remains an important source of the failure of the woods to regenerate naturally. As Louis Boppe, of the Nancy Forest School, said on a visit to Scotland in 1881:

As foresters of the Continental school, accustomed to live among forests regularly managed, and having for their object the production of timber, we had no little difficulty in understanding the widely differing motives which activate forest cultivation in this country. Everywhere we found the forests fenced on all sides with walls and hedges .... We learnt that these costly enclosures were erected, not for keeping out the cattle and deer, as in the Jura, but for keeping them in! It appeared to us like shutting the wolf in the sheepfold. (Anderson, 1967)

The use of the pinewoods for wood pasture, providing shelter and grazing for domestic stock was extremely widespread in the period before 1800, and had probably been so from time immemorial. Thus, the Forest of Mar around 1760
was referred to as ‘the best out-pasture for all kinds cattle to be found anywhere in Scotland’, and at Rannoch in 1780 the tenants complained that if the Black Wood was fenced for timber production they would lose their best pasture and only wintering ground (Michie, 1901; Lindsay, 1974). After around that time, proprietors interested in exploiting the pinewoods primarily for timber sales began systematically to exclude stock, but there were many others who had no interest in wood sales or found little opportunity to pursue them and continued to allow woods to be used for grazing. As time passed, however, sheep increasingly replaced cattle, and contemporaries observed the consequences. As Nairne (1892) put it:

In the beginning of the nineteenth century the institution of sheep rearing on a large scale had a distinct effect upon the Highland forests. The area under wood ceased its natural expansion, the young seedlings being all eaten up, while the herbage got so rough that there was not a suitable bed for the seed to fall in. On the other hand, black cattle, which formerly occupied the hills and valleys in large numbers, were favourable to the production of forests, as they kept the herbage down and trampled the seed into the ground, the result being that wherever they fed in the proximity of a wood a luxuriant crop of trees invariably made its appearance.

In some respects no doubt the absence of cattle made the heart grow fonder, for there were many eighteenth-century observations of the damage that grazing animals of all kinds did to timber production in woods, as when Smith (1798) noted how the remnants of old pinewoods in high glens shed seed driven over the moor by the storms, from which ‘a beautiful plantation rises up in spring’ only for ‘this precious crop, the hope for future forests’, to be destroyed when the cattle were driven up in spring.

As we dropped down into Strathspey, the road kept winding among large detached and scattered groups of trees, principally pines, which had an appearance so novel and striking, and so different from the artificial plantations in England, that we felt convinced they were the Natural Pine Forests we had read of. Trees of all sizes grew intermixed, though at a sufficient distance for each to assume its full character and receive the full influence of the sun and air, and for the larger ones to throw out their broad declining arms in graceful sweeps to a great extent. (Bowman, 1986)

Trees of this character had value for local use, as curved timber was preferred for house crucks and for ploughs, harrows, the cas chrom and other tools, while strongly curved or forked timber was favoured to tie the crucks together at the top (Grant, 1961; Hay, 1973).

However, open-grown trees in sparse woods were certainly not the only form of forest structure. Animals were readily controlled even without fencing in the centuries before compulsory education took the child herders off to school (from around 1870), so it would not be difficult to reserve portions of a wood to grow tall straight trees for specific local use. There is, for example, archaeological evidence of this in Castle Grant, spanned in the sixteenth century with very fine
pine timber up to 18 ft long and 14 inches in diameter, and also evidence in the account of the vanished seventeenth-century towerhouse of Macdonell of Glengarry which apparently used timbers of 24–25 ft in length. These must have been close grown (Cheape, 1995; Lee, 2002).

Furthermore, when an external market was discovered, this could alter instantly the intended management of a wood, as illustrated in 1730 in Strathglass when the York Buildings Company, having purchased the timber in the contract, debarred the proprietors ‘from cutting down, felling or carrying away the young firs growing in the woods therein’ (Munro, 1992).

A relatively small number of pinewoods had a reputation for being able to supply masts, which also surely implies tall, close-grown trees. Conaglen in Ardgour was one, supplying the Lowlands and Ireland, but the best known in the seventeenth century was the wood at Strathcarron, where an English traveller in 1677 saw pines ‘very high and straight, but of no great substance, about a man’s fathom’ (Hume Brown, 1892). The Royal Navy of the Cromwellian and Restoration period was interested in buying these as an alternative to Riga masts, but in the event found the sample supplied too small and unsuitable, ‘sorry stuff’ in the words of the authorities at Chatham dockyard (MacDonald in Smout et al., 2005). Strathcarron, nevertheless, for a time renewed a trade in naval masts that earned a bounty after 1707, and when the owner of Rhidorroch near Ullapool asked why he was not getting the same price for his trees as his friend in Strathcarron, he was told that by contrast his were inferior, not being ‘narrow’, since ‘they have been made havok of at pleasure, not only by all your own people in this country but also by the neighbourhood without much control’ (Clough, 1994).

Another wood subject to strict control, and which became known for tall straight trees, was at Invercauld, where the owners built sawmills to process the wood and floated much to market at Aberdeen. Pennant saw trees there up to ‘twelve feet in circumference and near sixty feet high, forming a most beautiful column’ (Pennant, 1774) and also said that nearby this ‘ancient forest’ was ‘another, consisting of smaller trees, almost as high, but very slender’.

Taking wood for local use mostly involved small timber, for construction, tool manufacture, fuel and light for the farmer and the cotter. Big straight timber would be of no use to them. As the reconstructed houses at the Highland Folk Museum at Newtonmore show, homes were made of various materials, including stone foundations, turf walling and heather thatch, but lavish use was made of small-size wood, and where pine was available it was obviously used, though never exclusively – birch and alder were often easier to obtain and just as useful. Because there was no advantage for local people in allowing trees to grow to great size, needs were satisfied by either cutting limbs off granny pines or harvesting trees of small dimensions, with or without the permission of the laird. On the estate of Cameron of Locheil in the eighteenth century, the wood at Loch Arkaig was preserved for the laird’s own use, but that of Glen Loy was for the use of his tenants (NAS, 1746). The strange, cut-about appearance of the oldest Scots pines there seems to testify to such exploitation. In Rothiemurchus, for example, activity of this kind was called ‘cutting the green wood’ and punished by the Baron Court (Doune MSS, 1705–1706, 1772–1773). This was not untypical, but it made sense to come to an arrangement whereby tenants could help themselves without interfering too much in the estates other interests, since those who needed timber like this also paid the rent.

The use of woodland for fuel varied from place to place. Deadwood was always a useful bonus for the locals, and estate regulations allowed it to be taken even when there was strict prohibition on taking green wood. Many parishes had peat supplies that could replace wood fuel, and if it was convenient and of good quality, the time and effort needed to cut the peat was often less than that taken to harvest living wood. In nineteenth-century Strathspey, however, even before the railways, the minister of Alvie reported that ‘peat was so distant from the parish and produced at so enormous a price that coal from Inverness was actually cheaper’ (Nethersole-Thompson and Watson, 1981). Wood fuel was then essential, but birch was preferred over pine by both the laird (who might regard it as a weed of the forest) and the tenant (who preferred less resinous wood in his hearth).

On the other hand, for light, ‘f ir candles’, the torches and splinters made to illuminate ordinary homes, had to be cut from Scots pine on account
of the high resin content. The inhabitants of the Black Wood of Rannoch and those of Glen Tanar were two groups who made a small living from cutting torch material from living trees and selling it at a considerable distance at the markets of Perthshire and Angus. In Abernethy in 1763 complaints about the abuse of the wood included ‘a most pernicious custom of cutting pieces from the body of large and thriving trees for candles and other uses, which wood for candles has been sold and sent out of Strathspey’ (Dixon, 1976). The mention of ‘other uses’ than candle fir can only be a reference to tenants helping themselves to boughs and crucks from living pine.

The market

What determined the structure and ecological value of the woods? Structure may be thought of as naturally a function of soils, drainage and altitude, but it was also likely to be affected in our centuries by the market. If the wood was far from a usable river or sea-loch, or if the market for timber externally was weak, the wood’s prime value was for animal shelter and grazing. Then we might expect the development or accentuation of an open structure with many spreading trees. If it was in a favoured location close to a shipping or floating point, we might expect more protection and encouragement of naturally close-growing trees. Where, as at eighteenth-century Rothiemurchus, there was a lively market for small pole timber for relatively local use, this may have kept the average size of the trees to within a dimension that could be comfortably cut by local axes and carried by horseback. Where there was an opportunity to use or sell for sizeable construction or ship-building timber, as at Strathcarron, there might be an attempt to encourage trees to grow much larger.

The market for animals and human demographic trends were also relevant factors. Under circumstances where there was pressure from cattle, or cultivation on the moor outside the wood, there might be interruption of natural regeneration. How pines regenerated away from their own shade was a process well understood in the eighteenth century, as illustrated during a lawsuit over the Forest of Mar in 1758–1760:

It is known to your Lordships, that, as fir-woods do not spring from the root, but are propagated by the blowing of the seed in the grounds immediately adjacent to the old woods, or in the openings, where they have freedom of air, these highland fir-woods are not fixed to a particular spot, but gradually shift their stances. (Michie, 1901)

Other consequences of human activity were also independent of the market. The gathering of deadwood would certainly have left the forests with less fallen and decaying material than modern ecologists would consider optimal for the benefits of biodiversity. On the other hand, cutting into living wood for lighting and building material left – from the laird’s point of view – an infuriating number of damaged pines, but insects, fungi and birds might have found that a gain.

From around the second quarter of the eighteenth century, a livelier market for wood resulted in a quickened interest in the exploitation of the pinewoods by outsiders. This had been foreshadowed in the seventeenth century by a certain number of events in the eastern forests, like the interest shown by Captain Mason in the Grant woods of Speyside around 1630, and the slightly more sustained interest shown by the Royal Navy in the masts of Strathcarron in 1652 and in 1665–1669. In the west there was more sign of activity in a trade in deals and masts from a number of scattered localities, including Loch Maree in the north, Ardgour, Loch Leven and Loch Etive. It is doubtful if any of this seventeenth-century activity had much impact, except perhaps to extract some of the biggest and straightest trees, especially in the west. At first, eighteenth-century activity was marked by the high rate of business failure, generally before much sustained felling had taken place: this appears to be true in, for example, the Loch Arkaig woods, those of Strathglass and in Rothiemurchus. At Abernethy, where the woods still appeared to outsiders to be virtually untouched when the York Buildings Company arrived a full century after Captain Mason, the subsequent felling operations had not gone very far before the company declared bankruptcy.

Altogether, the depredations of outside exploitation on the woods before around 1790 must be considered very limited, with one or two exceptions such as the catastrophe of the felling of the
woods of Glen Orchy, of which more in a moment. Another was the fact that the selective removal of the largest and straightest timber, and therefore of many of the oldest trees in close-grown groves, was probably widespread at all the accessible sites. If this is combined with a general increase in pressure on the woods through the rise of rural population and their stock (with cattle prices buoyant) throughout the Highlands in the course of the eighteenth century, it is probably true to say that late eighteenth-century woods would have had a younger average age structure than those of 300 years before. They were also probably more affected by heavy grazing by cattle, horses, sheep and goats both inside the woods and on the moors around, inhibiting regeneration.

What happened in the next half of the century was much more dramatic than anything before. From 1790 onwards, the lairds largely took over the exploitation of their own forests from outside speculators. The one important exception to this was the lease of Glenmore by the Hull firm of Dodsworth and Osborne in 1784, that felled the wood over the next 20 years for ship-building timber. Otherwise the main exploiters were the Grants of Grant at Abernethy, the Grants of Rothiemurchus at Rothiemurchus, the Dukes of Fife and Farquharson of Invercauld in upper Dee-side, the Earl of Aboyne at Glen Tanar, and so forth. In each case, faced with rising timber prices during and for a time after the wars with France, the owners cut heavily into the woods until there was little more saleable timber left to harvest. To the casual observer the results were catastrophic. As Selby (1842) saw:

The indigenous forests of Scotland, which formerly occupied so large an extent of its territory have, within the last sixty years, been greatly reduced, in consequence of the demand for pine timber occasioned by the difficulty of obtaining wood from the Baltic during the late wars: some, indeed, are nearly obliterated.

It was not quite a modern clearfell, because often the structure of the woods in terms of tree spacing and varied age would not lend itself to that, but it was much more than the intermittent selective felling of previous centuries. And it was accompanied by a quite novel attitude to alternative uses of the wood. In the past, hunting, grazing and local timber use had been broadly compatible: lairds did not want to hunt all the time, and providing the numbers of stock were not too great, they were happy to share the deer pasture with the farmers’ animals, and in recognition that farmers needed wood supplies to be able to continue to farm and to pay rent, they were also content to allow them to take it, subject to certain safeguards. Now, however, the profit from the timber in the wood overruled all other considerations. Deer were, in the biggest forests, often excluded as far as possible. Farmers, likewise, were ordered to remove their stock, and sometimes told to buy what wood they needed from the estate rather than to help themselves. Sawmills became larger and organized more on an industrial scale, as at Rothiemurchus. Forestry became much more professional. A wood was there to produce timber – everything else was a distraction.

The effects of this half century were not as disastrous as Selby implied. No forest was ‘nearly obliterated’, though the desolation that followed the quasi-clearfell struck many with horror. The most perceptive, however, also noticed how rapidly regeneration was recurring, and within a few decades the woods seemed much as before. It remains unclear exactly what ecological damage this episode did, for example, to the distribution of the characteristic flora, some of which may be highly susceptible to episodes of clearfell, or to insect life in the forests. The highly fragmented distribution of many species may owe a lot to the devastation of this period, particularly as it was mimicked again by the near clearfells that took place in many forests in the two World Wars.

By 1850, however, that episode was behind, and for the remainder of the nineteenth century there was little money to be made from pine timber in the old woods, unless, perhaps, as in Strathspey, a railway was being constructed nearby and a market for wooden sleepers suddenly appeared. Lairds reacted in two ways. For a few, the answer was to concentrate on the best-known modern forestry techniques, to plant pine close, to try foreign strains, to weed out birch where you could and to take a pride in your woods since only by going for quality and good husbandry could you expect to break even: the Lovat estates were the leaders in this approach, but their woods were mainly plantations. For most, the answer was to relinquish the effort to grow profitable timber, to allow the woods to
recover naturally since they might indeed be valuable again one day, but to allow them to go over primarily to a sporting use or to be part of a sheep run. To be a deer forest was the fate of such woods as Rothiemurchus and Ballochbuie, while at Abernethy the end of active forestry in 1878 resulted in the clearance of at least 104 people to make a deer reserve that employed five. To be a sheep run was the fate of Rhidorroch and several other woods. This was the period when Louis Boppe arrived in Scotland to express astonishment at the policy of fencing animals inside the woods, and when David Nairne believed that the switch from cattle to sheep had led to a failure of natural regeneration. The nineteenth century had been an age of a new intensity, successively in both felling and grazing, with biodiversity effects that are unknown in detail and may have been considerable, but which certainly did not amount to obliteration.

The lost woods

As far as the records allow us to say, most pine-woods that existed at the start of the seventeenth century exist at the present time, and many of these are of comparable dimensions to what they apparently were in the seventeenth and eighteenth centuries. But a number of pinewoods have indeed been obliterated since 1600, or reduced to small remnants, and it is instructive to see where and when this took place.

It is impossible to give a fully comprehensive list of the woods that we have lost, or may have lost, because of the ambiguity of some of the evidence. For example, in 1622 Sir John Grant of Freuchie obtained from the laird of Lundie in Glengarry rights over certain woods in Morar ‘growand and standand upone thair landis of Killeismorarache, Kilnamuk, Swordelane, Arethomechanane and Brakegarrowneinort’ (NAS, 1622). These may or may not have been pinewoods, and although the names are all unrecognizable now, the places to which they refer may or may not still be wooded under a different name. Similarly, place names containing the element ‘ghuisachan’, or some variant, that are now bare of trees are not infallible evidence of a former pinewood. Some are easily misinterpreted. Carn a’ Phrisghiubhais in Glen Einich on the Rothiemurchus estate, translated sometimes as ‘hill of the prized pine trees’, actually means ‘hill of the pine bush’ (or clump). Others may refer to resources of bog pine at high altitudes, characteristically 4000 years old and no evidence of any wood in historic time.

These problems apart, there is unambiguous evidence of about a dozen pinewoods obliterated (or nearly so) since 1600. Some of these were probably quite small. For example, in 1635 Sir James Campbell of Lawers sold 315 fir trees growing in the ‘wood of Corriechurk’, which was perhaps Corriecharmaig in Glen Lochay; the wood was never heard of before or since, but its disappearance is unlikely to have been solely due to this modest felling episode (NAS, 1635). Others were undeniably large. Timothy Point, c. 1590, depicted in his sketch map of Wester Ross, a wood at least 12 miles long, stretching on both sides of the Gruinard River and its tributaries and clothing both banks of Loch na Sealga, with the comment at two points ‘fyrewood’, and in the area north of Loch na Sealga he wrote ‘mechtie Parck of nature’, a phrase redolent of open country with scattered trees, like a gentleman’s hunting park (Stone, 1989). The wood was still there at the time of Roy’s military survey, c. 1750, but very much reduced, and of it today there is little more than a trace. Yet at no point in the past 400 years has there been any record of timber extraction. It seems that its disappearance could have been entirely natural.

Pont also placed a large wood along the southern shore of Little Loch Broom, without describing it further, and this was the area of which the Earl of Cromartie gave an account in a report to the Royal Society in 1710 (Mackenzie, 1710). He described how, as a young man in 1651 he passed ‘a Plain abut half a Mile round … all covered over with a firm standing Wood; which was so very Old, that not only the Trees had no green Leaves, but the Bark was totally thrown off; which the Old countrymen, who were in my Company, told me, was the universal manner in which Firr Woods did terminate’. In other words, he seems to have seen the very last traces of the wood that Pont depicted, and to have met people who were familiar with the phenomenon of woodland decay and regarded it as part of the natural order of things. Fifteen years later he passed that way again and found ‘not so much as
a Tree, or appearance of the Root of any: but in place thereof, the whole Bounds, where the Wood had stood, was all over a plain green ground, covered with a plain green Moss’. The countrymen told him the trunks had slipped away into the moss, ‘which was occasion’d by the moisture that came down from the high Hill above it’. As at Loch na Sealg, there was no hint at all that human action had any part in its demise.

Other northern woods that vanished early without record of human cause include the Coille Mhoir in Strath Nairn, now an almost bare rounded hill rising to 657 m with a few scattered pines: the wood according to local tradition was destroyed to discourage outlaws on the orders of Mary Queen of Scots, but this unlikely explanation received no support whatever from historical records. Another is in the upper parts of Mar, in Glen Derry, described as full of huge collapsing pines ‘some thirteen feet in girth’ blown over by the wind, and in Glen Lui (probably Glen Luibeg) collapsing into the bog, in a way reminiscent of the Earl of Cromartie’s account (Cordiner, 1780).

Further to the south and along the west coast, pinewoods disappeared or declined, that had certainly in several cases been the subject of human exploitation, sometimes heavily so. In the vicinity of Loch Hourn relatively little now remains of a wood enclosed by the Commissioners of Forfeited Estates in 1774 and apparently supporting a sawmill in the area as late as the Napoleonic Wars; a wood nearby in Knoydart, that Thomas Pennant reported seeing regenerating freely following a fire, has gone without a trace (Pennant, 1776). At Conaglen in Ardgour there are still relatively extensive woods of mixed pine and birch, but it does not seem to measure up to the account of around 1630 of ‘Great number of firr trees in this glen ... and there is a water in the glen which doth transport great trees of firr and masts to the seaside’. More indubitably gone are the woods of Glencoe, the subject of an attractive map by Timothy Pont with the words ‘Many Fyrre Woods heir alongs’ (Stone, 1989), decorated with tree symbols that were probably added later by Robert Gordon of Straloch. The Glencoe woods were extensive, and belonged partly to the Duke of Argyle and partly to Stewart of Appin; timber was sold from them to the Lowlands and to Ireland until at least the middle of the eighteenth century, though they had gone 50 years later.

Similarly, there were three or four apparently small pinewoods on Loch Etive, now virtually gone, for which seventeenth- and eighteenth-century contracts exist showing that pine was exported from them.

Most striking of all is the case of the Glen Orchy pinewoods, their remnants known as the pinewoods of the Black Mount and the subject of an attractive recent book by Wormell and Wormell (2003). The pinewoods were sold to an Irish partnership in 1723, and greatly impressed the buyers for the scale and quality: one of them called them ‘the best in Britain’ which probably implies that many of them were close grown and straight. At that time they covered a considerable area in Glen Orchy and the surrounding glens, and the seller, the Earl of Breadalbane specified that none should be cut that fell below 2 ft circumference at three foot from the ground. The Irish set to work but 2 years later the Earl arrived in person on a tour of inspection and found a scene of devastation – they had cut more than half the pine without leaving a standing tree, and were set to fell the remainder in the same way. He wanted to sue them for breach of contract, but then realized that he could find no trees below 2 ft in circumference in all the remaining woods: they were all ‘very tall trees’, and the Irish continued to fell them until 1736 at least (Watson in Smout et al., 2005).

What had happened was that the Irish swept the forest clear of pines, except in a few inaccessible places, because there were few young ones in the wood. In other words, there had been a prior failure of regeneration, perhaps because the trees were so close grown that they could not regenerate beneath the canopy and then because for some reason they could not do so by ‘shifting their stances’ to the moor beyond.

**Conclusion**

Taking all the evidence of the disappeared pine-woods in their entirety, one is struck by the fact that they all relate either to the west coast, or to woods at high altitudes. Furthermore, those cases where they disappeared without any known human agency are all concentrated in the north and north-west, while those on the west coast
south of Knoydart were subject to felling episodes that removed the mature standing trees, possibly as in Glen Orchy in circumstances where there was little or no natural regeneration. Even today regeneration occurs much more readily in the drier east coast than on the west, where moss and peaty ground make a less suitable seedbed. This suggests that an element of climatic stress is implicated, and that the woods were at least partly victims of the period of exceptionally cold and wet, windy, oceanic weather, associated with the later sixteenth and seventeenth centuries, and not completely finished before the nineteenth century. In these circumstances, pines in marginal places at the edge of their range were likely to die and regeneration to fail. It would happen first in the north and at great heights: in Europe, one effect of the worst decades of this period, felt from the Vosges to the Sudeten mountains, was to lower the treeline by 200 m (Lamb, 1985), and a similar effect might be expected on the high ground and oceanic rim of Scotland. Where the climate was slightly more benign, as south of the Isle of Skye, mature trees might last longer but regeneration largely fails, and then ultimately becomes impossible when the mature trees are felled.

In pre-history, Scots pine had ebbed and flowed across the face of the country, showing, in Tipping’s words, ‘exceptional mobility and fragility because pine is very sensitive to climate change’. At one point, about 7000 years ago, Galloway had had natural pine: in Caithness and Sutherland, less than 5000 years ago, pine briefly reached the north coast and suddenly re-treated again. On Rannoch moor, pine disappeared less than 6000 years ago, and in most places fossil pines eroding out of the peat turn out to be 4000 years old (Tipping, 2000; also Bridge et al., 1990; Gear and Huntley, 1991). If climate change was a major factor in pre-history, it is also likely to have been so in recent centuries.

To look for a single explanation, however, would be to oversimplify, as there is also evidence that regeneration in the west could on occasions at least readily take place, as at Knoydart after fire noted by Pennant in 1772, and even in some Argyll glens if Smith in his evidence of 1798 really is speaking of Argyll and not upland Perthshire (one of his examples relates to the parish of Little Dunkeld). In these cases and others we should suspect that any problems caused by climate change to have been exacerbated by overuse and overgrazing. What can be ruled out as a cause for total loss (except possibly in the case of Knoydart) is the arrival of commercial sheep-farming, as the lost woods effectively disappeared before the sheep arrived. Others in the eighteenth century already of open structure, like Rhidorroch, were then grazed predominantly by cattle. That is not to deny that the coming of sheep made things worse in the nineteenth century in the manner described by Nairne.

In conclusion, the story of the lost woods may not in the last resort be one of human use and greedy insensitivity towards the environment, as it is often portrayed, but of natural climate change as the primary cause and, in some cases, of human exploitation as a secondary one. It might even be considered that Scots pine, a continental tree in Scotland at the oceanic edge of its world range, has not naturally been very widely or continuously distributed here under the climatic conditions of the last 500 years, and that it was easily further discouraged by episodes of adverse climate change within that period. This would help to explain why so many well-intentioned schemes for pine planting or natural regeneration, financed by native woodland grants in the last decade in the uplands outwith the main strongholds of the species in Speyside and Deeside, are struggling or failing today.

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