***Landscape change in the Scottish Highlands*: a review**

Fenton, J. (2024). *Landscape change in the Scottish Highlands – imagination and reality*. Whittles Publishing Dunbeath, Caithness.

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ABSTRACT

This article challenges the proposition put forward by James Fenton is his book *Landscape Change in the Scottish Highlands* that the landscape is natural. The scientific basis is lacking from his arguments. He relies on his own observations and those of travellers and others without any scientific material being presented to back up his argument. This review quotes from the scientific evidence by internationally respected palaeo-ecologists that demonstrate that there is factual evidence of tree and woodland removal by humans on many occasions over the millennia since human settlement. The book and this review should hopefully stimulate further scientific analysis and result in a more objective debate on whether the landscape of the highlands is natural or most likely the result of human activity or a combination of both.

KEYWORDS

Scottish Highlands. Landscape. Woodlands. Forests. Tree removal. Grazing. Human intervention.

James Fenton's book *Landscape Change in the Scottish Highlands* has the subtitle 'imagination and reality'. Though not posed as a question, it could have been given the long-standing and still controversial issue about the history of the land surface of the Scottish Highlands. Does the answer lie in the science of restoration ecology or political landscape assessments? Or does it rest with the will of the people? And, if so, which people - those who have lived there all of their lives or those who are recent settlers or those afar in towns and cities? Or does it lie with the whim of the capitalist land market to be traded as a commodity or owned as a bragging right? Or is it the will of the politicians who wish to right the wrongs of the people who were cleared off the land? Oh dear, what a confused and confusing topic.

James Fenton, a botanist by academic training and an ecologist by activity, seeks to address some of these issues in his *magnum opus*. His hope is 'that this book will show what will be lost if the Highlands landscape is no longer celebrated as an unspoilt land and as one of the *most natural* areas remaining in Europe' (Fenton, 2024, p. 6, added emphasis). He thereby issues a challenge about what is natural. In his preface he states 'I hope that this book will see the landscape of the Highlands through objective eyes and see it for what it is' (p.vi.). To my reading, this statement rather betrays an attempt by the author to demonstrate to himself that what he thinks accords with the scientific evidence. I suggest that the author is overlooking key evidence on the nature of change across the Highland landscape: the open heaths and bogs that we have today are predominantly a combination of human-and climate-influences and, with few exceptions, are *not* purely natural and unchanged.

I freely admit that I see the landscape of the Scottish Highlands through different lenses. First, as a geographer-geomorphologist and second, and added to the first, as an environmental strategist and policy adviser. My task in this review article is to see whether Fenton succeeds in his 'imagination and reality' arguments. More especially, the reader needs to test whether his arguments are

scientifically sound or maybe represent a personal view formulated through his experience of a mixture of objectivity and subjectivity.

There are many *ex cathedra* statements to justify Fenton's argument that the Highland landscape has been naturally non-wooded, open moorland for millennia due to climate changes some 4,000 years ago. Phrases such as 'compartmentalisation of the landscape' with current restoration actions and 'naturally high levels of grazing', the former bad and the latter good in his view, are used throughout. He uses his own work to support his arguments and selected quotes from those who support his thesis. He shuts his mind to other elements of the natural ecosystem, especially birds and other animals. In doing so, he ignores the indisputable fact that the top predators were more abundant in the Highlands in the nineteenth-century Highlands than now due to persecution. He also shows a lack of understanding of the area's ecology (see, for example, State of Nature – Scotland, 2023). His arguments are at times tautological. For instance, on page 52 he argues that the ultimate reason why the Highland landscape is largely treeless is that there is sufficient vegetation to feed a larger population of animals, stating that the Highlands has had high numbers of deer throughout the postglacial era, although there is no known evidence to support this statement.

Inevitably, Fenton's thesis take us into the contested terrain of the formation of the surface of the Highlands. I choose my words carefully as my perspective is as a geomorphologist and a co-author of the well-known tome on the geology and landforms of Scotland (McKirdy et al., 2007). The pre-human landscape and even many of the changes happening currently on the land surface, such as rock failures, now so well documented (Ballantyne, 2019), demonstrate that abiotic factors are by far the dominant force and creator of the landscape as it exists today. This is despite what ecological commentators such as Fraser Darling and Fenton claim. So let us get one thing straight for readers: it is the geochemistry of the rocks and soils, the tectonic movements in all directions and the effects of the forces of wind and precipitation that are the dominant evolutionary forces in the Highland landscape. The vegetation is profoundly influenced by such forces, as well as by successive human direct and indirect influences.

Fenton happily quotes non-scientific writers in support of his argument that the current land surface is indeed 'natural'. The problem is many of these commentators see the landscape subjectively. Feelings for the landscape are determined by the season, the weather, the light, and the mood of the writers when setting down their thoughts. We should also note that these analysts have been writing over the last 300 years, many millennia after the arrival of the first settlers who are considered by historians to have had an effect on trees by using them for fuel, building and weapons.

I am surprised by the continual reference to the Great Wood or Great Forest of Caledon throughout the book. What is Fenton trying to prove? We have known for a long time that it was the figment of the imagination of travellers to the Highlands in the 17th and 18th centuries. Chris Smout, the renowned environmental historian (and a winner of the RSGS Geddes Environmental Medal), has stated that the so-called Great Wood of Caledon from river bank to mountain top is 'a figment of our cultural imagination' (Smout, pers. comm. 2024). It is also ecologically incorrect as there are many areas of wetlands, rock outcrops and screes where trees would not be able to grow into woodlands and forests.

Fenton's argument is neatly summarised on page 33 when he says, tongue in cheek, that 'humans destroyed the forest, so humans must put it back, a neat story and in keeping with the spirit of the age. But what if we have got this all wrong?" I can understand this question as too often we never

stop to think whether the current view could be wrong, and accept that we do need to listen to the sentient and often lone voice to check our mainstream thinking. Fair point. This takes me back to the initiative started in the late-1990s by Scottish Natural Heritage, Natural Heritage Futures (SNH, 2002), to look at what we - the region's human stewards - should be doing ourselves and working with others over the next quarter of a century. This forward-looking exercise forced us all to think through what had happened and was happening and the reasons why, and to open our minds to what was likely to be possible for the next two decades.

Fenton's whole argument seems to be presented in one paragraph all too briefly summarising the detailed scientific work of John Birks (Birks, 1988) concerning the five phases of climate change and vegetation growth and decline. Fenton suggests that the trees clearly recorded in the pollen diagrams were lost due to natural climate and weather changes. The fact that the declines are almost always accompanied by rises in grasses and sedges is ignored, although both archaeologists and ecologists have linked these changes to human intervention. Certainly, there is evidence from some of the most detailed scientific assessments of lake sediments and peat bog pollen of the effects of climate change. Calculable declines in native tree pollen have been discerned, but not the wholesale disappearance of trees from the pollen rain that Fenton implies. At Loch Sionascaig in north west Sutherland, for example, Birks (1993a, p. 141) concluded that 'the demise of pine around 4200 years ago, following rapid climate change to wetter and windier conditions, and the subsequent development of blanket bog are clearly demonstrated'. However, this conclusion cannot be applied uniformly to the rest of the Highlands. Writing of the site on Loch Maree, Birks concludes that 'the present pattern of pine, birch and oak woodlands has been in existence for the last 4000 years' (Birks, 1993b, p 146). It is a pity that Fenton does not review these site studies or present any pollen diagrams constructed by palynologists to back up his argument or the inferred climate changes from their analysis.

I have consulted John and Hilary Birks for their wisdom as they are by far the leading scientists on these issues. Their current view is as follows:

> There is some pollen evidence for human impact in a few areas of the Highlands for local temporary clearances from about 5000 BP. Extensive clearances occurred at different times in different areas –
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> NW Highlands and eastern Skye: 3700 - 4000 BP
> Skye and N Sutherland: 2500 - 2900 BP
> Knapdale and Ardnamurchan, S Skye: 1400 - 1700 BP
> Grampians and Cairngorms: 300 - 400 BP.
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> Extensive clearances involve about 50% of the pollen source area of a site (usually about 5-15 km radius) being cleared. The small areas of scrub on Shetland, Orkney, Harris, Lewis, NE Caithness, etc were largely destroyed around 4000 BP. The pre-Roman Iron Age extensive clearances were mainly confined to areas of dominant birch-hazel woodland and scrub. Post-Roman clearances affected mixed deciduous woodland of western Scotland. Extensive clearance was comparatively recent in the Grampians and the Cairngorms. (Birks and Birks, pers. comm., 2024).

In summary, John and Hilary Birks conclude that '[t]he available pollen-analytical data from the Highlands suggest that extensive deforestation occurred at different times in different areas, ranging from about 4000 calibrated years before present in the north-west Highlands and eastern Skye, to about 400 calibrated years ago in the Grampians and Cairngorms.' (pers. comm., 2024).

Further evidence of human influences on the vegetation of the Highlands is presented by Derek Ratcliffe, the then Chief Scientist of the Nature Conservancy Council, and Des Thompson, a member of his team and subsequently a leading scientist on upland ecology and management (Ratliffe & Thompson, 1988). They depict six phases of human activity which significantly influenced the vegetation: extensive forest clearance 3900-300 years BP, extensive use as sheep grazing from 300 BP onwards, land 'improvement' for grouse moor management and for sheep and red deer from the early 19th-century onwards, persecution of large predators related to sheep and game management from the mid-19th century, industrial acidification from 200 BP, and most recently extensive conifer afforestation. There is thus abundant scientific evidence pointing to climate *and* human influences driving the loss of woodland cover across the Highlands and Islands. To state that only climate has given rise to the prevailing treeless landscapes of today does not accord with the scientific evidence.

Fenton argues that grazing is a natural element in upland ecosystems rather than a deterrent to tree growth. He fails to recognise that if herbivores are removed from the Highlands the ground vegetation changes from an arrested succession (as we see across heather moorland) to one with the growth of both shrub and tree layers (arising from long-lasting seed sources in the soil). There are countless examples of this process occurring in the Highlands. For example, research on the slopes of the Trotternish Ridge in north-east Skye, led by scientists at the James Hutton Institute (Brown & Birnie, 2012), demonstrates that seed sources were readily activated into growth if areas were fenced off from herbivores, such as rabbits and sheep, each in different enclosures to demonstrate the effect of each type of grazing. In Inchnadamph, north west Sutherland, where the vegetation was protected from grazing animals by a fence, flowering plants, predominantly wood anemones that are indicators of previous woodland, are found, although Fenton disputes this conclusion (Fenton, 2024, p. 13). Having visited the area with one of the UK's most respected conservation ecologists, Michael Usher, I stand by his view rather than Fenton's. The description in the most widely accepted book on British wild flowers that these are woodland plants gives further backing to the argument (Blamey et al*.,* 2013, p. 30). He uses cultural history rather than ecology to back his argument: the Gaelic name for what is termed wood anemone is 'flower of the wind', a cultural rather than a scientific construct.

There are many other examples. On Mar Lodge visited by ecologists, including Fenton, in 2017, the same standoff in the argument between him and the rest of the group occurred. Suffice to say, that it is clear from this and subsequent visits to the estate that the reduction in deer numbers has resulted in a rapid regeneration of the native pines demonstrating that the seed sources were there but also that their germination and growth were thwarted by the pressures from herbivores. This recovery of native tree and shrub vegetation is even more apparent on the Glenfeshie Estate. Visiting the area around Glenfeshie Lodge in spring 2015 for the presentation of the RSGS's Geddes Environmental Medal to the outstanding Highland land management expert Dick Balharry, it was obvious that pine, birch, rowan, and both prostrate and conical juniper had recovered as a result of the radical reduction in deer numbers encroaching over the march line onto the estate. And yet Fenton criticises the management of Glenfeshie for producing a landscape with 'unnaturally low levels of grazing' (p. 41). How can he arrive at this conclusion when the regeneration there is occurring in response to a heavy cull of deer, allowing seed sources in the soils to germinate and grow? Does he not recognise that this restoration ecology, which he dislikes, will result not in the total coverage of the ground but in a natural landscape where wet areas and rock areas will remain treeless or at least with sparse tree or shrub cover?

Fenton also assumes that red deer are a good thing but avoids addressing which are native and which are not. For example, the intensively studied red deer on Rum were brought from estates in

southern England and there is clear evidence of hybridisation between deer species. He ignores the existence of frequently grazed trees that can be many decades old, such as the pines in the Northern Corries of the Cairngorms which appear as natural 'bonsai forests'.

Furthermore, Fenton does not explain why heather covers much of the land surface. Is it a natural consequence of climate change or is it a cultural manifestation of land management? And he fails to recognise that heather moorland displays a variety of vegetation, with *Calluna* and the two *Erica* species alone forming a range of types depending on soil wetness alone. An alternative view is that from John Birks, who states that, '[a]s regards dwarf-shrub heaths and heather moorland within the forest zone, these became locally common following extensive deforestation, especially in areas of acid rock. Heather moorland is surely an anthropogenic creation through repeated muir-burn' (Birks, pers. comm., 2024). This view supports the conclusions of Ratcliffe and Thompson (1988, p. 18 & pp. 22-23). Is Fenton being defensive about grouse moors? He certainly appears to be equivocal about the role of grouse shooting from a landscape perspective. He concludes that 'the red grouse-heather ecosystem is found nowhere else in the world … . They should be celebrated for contributing to the essence of the Highlands' (Fenton, 2024, p. 64). In fairness, there is a strong argument to say that well-managed heather moorland should be celebrated for its distinctive wildlife (see Thompson et al., 1985). Some would argue that the 'essence of the Highlands' has been the product of poor land management practices such as illegal persecution of raptors and poor muirburn practices, as opposed to the result of sustainable moorland management.

Maybe a weakness in resolving these arguments is that there has been insufficient recent scientific research to draw out what actually happened. This is not to criticise the earlier scientific work, but to suggest that a more scientific synthesis is needed, separate from the one that Fenton is determined to tell which he considers is objective and correct. The issue remains whether trees have disappeared from Highland landscapes due to climate and weather changes or due to deforestation by humans. Smout considers that the matter is one of cultural subjectivity: the open country of heather moor and peat bog is really the distinctive feature of Scotland. Furthermore, he considers that comparisons of the percentage of land under trees are not relevant, and that Darling's description of the Highlands as a devasted country is subjective, not scientific. Smout reminds us that '[t]e planting of native trees is also misplaced, unless they are known replacements for a wood proven to be present in the past' (Smout, pers. comm., 2024). Not unreasonably, Smout comes down on the side of societal choice.

The book has some valuable photographic essays on aspects of landscape change that have happened over the last century and many that are occurring now. For those who do not have an intimate knowledge of the Highlands, these are good examples of the problems of intrusive development, the lack of understanding of the ecological effect of development and the poor management of the changes. Hydro-electric power schemes, overhead transmission lines, bulldozed tracks, vehicle off-roading, wind farms, gorse invasion and run of river hydro-electric schemes are all covered. I certainly agree with his comments on the negative impacts of commercial afforestation using non-native species such as Sitka spruce on carbon rich soils and on peat of any depth. This practice is something that requires immediate attention by Scottish Forestry, the government agency, to align practice with the Scottish Government's Net Zero targets and to ensure that they are enforced in all new planting. The Royal Society of Edinburgh's recent report on forestry is instructive on these matters (RSE, 2024).

Fenton also includes native tree planting and peatlands restoration in this critique as he considers that both these government funded activities are anathema to the landscape which he espouses as natural. His emphasis on retaining the wild landscape means that he refutes many of the arguments in favour of biodiversity action and ecological restoration which are the focus of current action with government funding. However, he is right to question whether native tree planting is undertaken with insufficient care to the type and mix of species in relation to soil and local weather conditions, as too often the approach adopted does seem to be like 'gardening in nature'.

Fenton also refutes the work on restoration of montane scrub vegetation, as he claims that the latter is merely a relic of earlier arctic climate. This refutation fails to recognise its existence on many mountains in the Highlands where its growth is arrested by herbivore grazing. This situation is a parallel to the Highland Commons grazing of Iceland where the substantial reduction of sheep from the summer grazing areas has meant that the native shrub species, such as downy willow, are regrowing and covering more of the ground surface.

How can he argue that riparian planting, for example along the middle sections of the River Clunie south of Braemar, results in compartmentalisation of the landscape when it is natural that trees grow along river banks and provide shade and nutrients to the water body and its species? And how can he argue that peat should be allowed to naturally erode and therefore that peatland restoration schemes are not justified? The contrary argument is that loss of carbon to the atmosphere increases the Greenhouse Gas effect, and that peat washed into streams and rivers damages the spawning grounds of fish and the overall quality of the water. In other words, his dislike of and disdain for any restoration of what he regards as 'unnatural' is highly questionable according to modern ecological thinking. Yes, we should consider whether all of our strategies and action have a sound scientific basis, but we should not sit back and do nothing, as Fenton suggests, when there are so many unnatural activities affecting the biodiversity and landscape of the Highlands.

One matter that he is clear about and where there will be a consensus concerns the landscape and ecological impact of invasive non-native species. There are many culprits. Fenton makes a statement that most would agree with: 'a Highlands landscape dominated by self-seeded Sitka spruce, rhododendron, cotoneaster, swamp cabbage and Himalayan honeysuckle, will be very different from that we know today' (Fenton, 2024, p. 153). However, what he says next is much more challengeable: 'but surprisingly little notice is being taken. People are far too busy planting new woods or restoring peat bogs' (p. 153). Surely this is an observation failing to recognise the wider value of these activities that are occurring around the Highlands?

Fenton's conclusions are rather weak as he is keen that the wildland feel is retained. He argues for the 'other country' of his imagination, focussed on 'wildland' with no human activity allowed except for low-intensity livestock grazing and harvesting the natural surplus with low-impact red deer stalking and low-intensity grouse shooting being allowed. This argument reads like a charter for the Highland sporting estate. The Scottish Government and Scottish Parliament clearly disagree with this thinking, as the recently approved Wildlife Management and Muirburn (Scotland) Act 2024 and the current consultation on tightening the enforcement of sporting estates activities all attest.

Fenton despairs that 'there does not seem to be any strong will, whether from government, local authorities or the public to give stronger protection to the Highlands landscape … which is why it continues to disappear' (p. 173). Here he is absolutely right. The unwillingness seems to lie at Scottish Government level, despite advice from NatureScot (NatureScot, 2023) and despite the

excellent work by the Scottish Landscape Alliance (Scottish Landscape Alliance, 2020). The weak safeguarding of wild land areas and the National Scenic Areas remains a problem which Government needs to address in the light of the landscape changes that Fenton illustrates so effectively in his photographic case studies.

All said, the author is to be congratulated in giving us the opportunity to open debates about the drivers of change in Highland landscapes, be these natural or human-induced, and about what society should be doing about such change. I disagree with many of his arguments and lines of evidence, but at least he has set out his case. How much is really the result of natural changes as opposed to human intervention is clearly debateable ground where science needs to take a renewed look on the reasons and the degree of variation over such a vast landscape as the Highlands. I hope that Fenton's book will stimulate a more nuanced debate about the questions that I raised at the beginning of this review. So many issues at stake are human constructs reflecting perception, prejudice, current rhetoric and more. Reading Fenton's book should perhaps impel us to experience this landscape with renewed eyes through our scientific understanding and from our cultural perspective. This is all to the good. I nonetheless posit that it is ecologically and scientifically obvious that, when the level of grazing intensity is lessened, the changes in vegetation are clear for all to observe: a 'reality' not just in the 'imagination'.

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References

Ballantyne, C. K. (2019). *Scotland's mountain landscapes: a geomorphological perspective*. Dunedin, Edinburgh.

Birks, H. J. B. (1988). Long-term ecological in the British uplands. In Usher, M. B. & Thompson, D. S. B. (eds.), *Ecological change in the uplands* Blackwell, London, pp. 37-56.

Birks, H. J. B. (1993a). Loch Sionascaig. In Gordon, J. E. & Sutherland, D. G. (eds.), *Quaternary of Scotland*. JNCC Geological Conservation Review Series. Chapman and Hall, pp. 137-141.

Birks, H. J. B. (1993). Loch Maree. In Gordon, J. E. & Sutherland, D. G. (eds.), *Quaternary of Scotland*. JNCC Geological Conservation Review Series. Chapman and Hall, pp. 143-146.

Blamey, M., Fitter, R. & Fitter, A. (2013). *Wild flowers of Britain and Ireland*. Bloomsbury, London.

Brown, E.C. & Birnie, R.V. (2012). Trotternish Ridge SAC: long-term monitoring of vegetation and erosion, historic change and management recommendations. Nature Scot Commissioned Report 505. https://media.nature.scot/record/~b7a457c042

Fenton, J. (2024). *Landscape change in the Scottish Highlands – imagination and reality*. Whittles Publishing Dunbeath, Caithness.

McKirdy, A., Gordon, J. E. and Crofts, R. (2007). *Land of mountain and flood: the geology and landforms of Scotland*. Birlinn, Edinburgh.

NatureScot. (2023). NatureScot Landscape Policy Framework | NatureScot

Ratcliffe, D. A. & Thompson, D. S. B. (1988). The British uplands: their ecological character and international significance. In Usher, M. B. and Thompson, D. S. B. (eds.). *Ecological Change in the Uplands.* Blackwell, London, pp. 9-36.

RSE (2024). *Public financial support for tree planting and forestry.* Royal Society of Edinburgh, Edinburgh.

Scottish Landscape Alliance. (2020). Microsoft Word - Position Statement on Landscape_landuse_economy (scotlandslandscapealliance.org)

Scottish Natural Heritage. (2002). *Natural Heritage Futures*. Natural Heritage Futures | NatureScot

State of Nature – Scotland. (2023). Scotland - State of Nature

Thompson, D. S. B., Hester, A. J. and Usher, M. B. (eds). (1995). *Heaths and moorlands: cultural landscapes*. Scottish Natural Heritage. HMSO, Edinburgh.