

**Correspondence between Dr James Fenton and Professor Christopher Smout on the pamphlet "Towards a New Paradigm for the Ecology of Northern and Western Scotland February-March 2013 *Oldest to newest***

From: T.C. Smout  
Sent: Sunday, February 10, 2013 3:34 PM  
To: info@james-hc-fenton.eu  
Subject: pamphlet

Dear James

Your booklet arrived last week and is very absorbing.

For your interesting argument to be completely convincing it needs to address the objections brought forward to your argument by K D Bennet in his response to your article in *Plant Ecology and Diversity*. These boil down to his arguing that anthropomorphic influences are too ancient, and their scale too great, to be lightly dismissed in favour of predominantly natural causes, and he argues for the relative unimportance of deer compared to sheep. Even in prehistory, he suggests, the impact of sheep populations would have approached that of modern deer populations, and cites figures to suggest that now sheep populations have a grazing impact 5-10 times that of deer.

How can you counteract this criticism? I am not sure, but it is clear that modern sheep are not only vastly more numerous than ancient sheep, but also that they are much larger. Partly this was because there was no way of keeping them at high densities until the advent of winter feeding in the 19<sup>th</sup> century. It is also clear that red deer today are much more numerous than they were in the past, at least than they were in the 18<sup>th</sup> century. Sheep also played a much less prominent part in the Highland farmer's mix of stock, and cattle and goats a much larger one. The ubiquity of goats in premodern Highland farming is, though, a considerable additional objection to any 'purely natural' theory of the origin of open land.

How far can you get without some attempt at quantification of the numbers and size of animals and trees in the premodern period? Let us suppose that you can make an attempt for ca. 1800, by which time (if my calculations are right) around 90% of Scotland was treeless, most of the trees being in the Highlands. Let us suppose therefore that at that time 70% of the Highlands was open space. Then we can conclude that x numbers of deer equivalent (deer and stock) coexisted with y area of open space. Would the grazing pressure exerted by x be enough to account for y being so high? Can we go back further in time? Not for x, but perhaps it might be possible to argue that the value of y had not varied for centuries—ie that there is no good evidence for there being less open land in the late middle ages than in 1800? In the early middle ages? In the Bronze Age? In the Neolithic? The evidence for this has to come in the form of good quality pollen diagrams. Is it there? I have no idea.

One point that interests me is your pointing up the doubtful nature of the Norwegian analogy for Scottish experience. I have been interested in the evidence for extensive forest regrowth in Norway after the Black Death, and its absence in Scotland. If the open land in Scotland was natural, then the collapse of the human population that led to regeneration of forest in Norway would have no such effect in Scotland.

I look forward to further discussion of all these points and others too.

Best wishes  
Chris

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From: James Fenton  
To: T.C. Smout  
Sent: Sunday, February 24, 2013 10:56 PM  
Subject: Re: pamphlet

Dear Chris

Rather a rambling response, but it is a multi-faceted subject without one dimensional answers, and a lot of the issues are interlinked. The response is really me thinking aloud in a relatively unstructured manner – and I might not have answered all your questions...

A. For your interesting argument to be completely convincing it needs to address the objections brought forward to your argument by K D Bennet in his response to your article in *Plant Ecology and Diversity*. These boil down to his arguing that anthropomorphic influences are too ancient, and their scale too great, to be lightly dismissed in favour of predominantly natural causes, and he argues for the relative unimportance of deer compared to sheep. Even in prehistory, he suggests, the impact of sheep populations would have approached that of modern deer populations, and cites figures to suggest that now sheep populations have a grazing impact 5-10 times that of deer.

1. I am taking an ecological approach. The appendix in my booklet does compare the ecological carrying capacity of deer (78/sq km) to that of blackface sheep (131/sq km): sheep are smaller and you need more of them to have the same effect as deer.

2. In the 1980s I carried out a survey of a random sample of birchwoods across the then Highland Region and the conclusion was that deer have more impact on birchwood regeneration than sheep – not surprising really when deer are browsers as well as grazers. In this survey there was one site above Strath Glass where, from memory, six old birch trees were covering 3ha of ground with new birch regeneration – in spite of heavy sheep grazing<sup>1</sup>. Heavy sheep grazing does not necessarily mean woodland loss.

3. This ties in with more recent experience at Culloden battlefield where birch colonisation of *Calluna* heathland (the heather followed clear felling) was proving impossible to control. Hence a project was developed to bring in Hebridean sheep (a 'primitive' breed meant to be better at browsing) to control the birch. In the event they failed – rowan, yes; willow, yes; gorse, yes; broom, yes; birch, no; pine, no. The sheep did browse some of the birch but were in no way controlling its spread. The sheep were fenced into the heathland and so had to eat what was there; in fact one winter there were sheep starving to death (the vet had to be brought in). There was evidence, though, of them eating the heather and so increasing the amount of grassland (think of the grass-covered Border hills with their long history of sheep).

4. One area of Culloden battlefield which had old growth *Calluna* (pre-dating the conifer plantation) appeared to be resisting birch colonisation: an issue I do raise in the booklet, about old growth *Calluna* species being able to outcompete tree seedlings. Grazing is only one factor affecting tree regeneration.

5. Hence one has to be wary of simplistic 'sheep grazing destroy woodlands' statements. Grazing does open up the soil to birch and pine colonisation (through trampling creating seed beds) and can also result in 'coppicing': keeping trees and shrubs prostrate (and hence also possibly longer-lived?? As an interesting aside, Dutch elm disease does not kill elms, but keeps them eternally young). This is why relaxation of grazing results in bursts of regeneration (page 10 of my booklet): the sheep are not killing the young trees, but keeping them short; this does not mean, of course, that sheep never kill trees. Research I have done at Glen Affric shows exactly the same thing with red deer and Scots pine<sup>2</sup>.

6. One of the difficulties of arguing for high sheep numbers in the past, in addition to the low density of humans to manage them, is the presence of wolves. You cannot have free-ranging sheep and wolves – witness the livestock enclosures on Ben Lawers. I imagine the old fashioned transhumance system of shepherded flocks was the norm (as in Norway today where there are lots of trees!); and, as stated in the booklet, summer only grazing probably results in the optimum conditions for tree regeneration.

7. But my key argument is that you cannot graze livestock, or deer, above the ecological carrying capacity: and at the end of the day it is the number of mouths eating trees that is important, not the species of animal (although deer are better than sheep at eating trees).

8. Any ecosystem which cannot survive grazing at the ecological carrying capacity is likely to die out or be unstable: which is one reason, perhaps, why woodlands also appear to have declined on acid soils in pre-human interglacials: to me, the similar pattern of woodland decline in previous interglacials (without humans) is a strong argument (see quotes on p.3). Grazing levels are bound to have fluctuated over the millennium in upland Scotland, and whether naturally or artificially, this is likely to have led to periods of woodland expansion, perhaps locally, which temporarily mask long-term decline in upland Scotland.

9. On richer soils in temperate areas (e.g. lowland Europe), Frans Vera shows how temperate woodland can persist as a mosaic even when grazing is at the maximum carrying capacity; I note in my booklet that in upland Scotland Vera's model will not operate, increasing the probability of an open landscape. St Kilda shows that most Scotland upland habitats will look much the same as now even with sheep at the full carrying capacity.

10. Hence, whether or not humans had colonised Scotland, I would suggest that the pattern of woodland cover would be much the same as pre-Forestry Commission days – except there were probably more trees in places they were of economic importance (e.g. iron smelting, Strathspey).

11. Where humans, in my view, have had a much greater impact is the loss of peatlands, particularly over lowland Scotland (and peatlands can be inimicable to trees): for some reason this story has not been told. Much of the Central Belt, for example, could have been bog: hence even woodland 'restoration' schemes here are not reverting the landscape back to a more natural ecology. However, you cannot recreate raised bogs without going through the full successional process; so perhaps, without human intervention, the Central Scotland Forest could become bogland in, say, five thousand years??

B. How can you counteract this criticism? I am not sure, but it is clear that modern sheep are not only vastly more numerous than ancient sheep, but also that they are much larger. Partly this was because there was no way of keeping them at high densities until the advent of winter feeding in the 19th century [it was learnt that hill sheep could be kept without winter feeding]. It is also clear that red deer today are much more numerous than they were in the past, at least than they were in the 18<sup>th</sup> century. Sheep also played a much less prominent part in the Highland farmer's mix of stock, and cattle and goats a much larger one. The ubiquity of goats in premodern Highland farming is, though, a considerable additional objection to any 'purely natural' theory of the origin of open land.

12. Surely the vast majority of the Highlands was already open ground by the time the wolf was exterminated and post-Clearance sheep farms came on the scene (see map on p.10, for example)? And hence are largely irrelevant to the story? It is the story before large scale sheep farming that is the interesting one: with a maximum carrying capacity, then logically if there are more sheep then there are less deer. Deer numbers are nowadays going up as sheep numbers are coming down. Deer numbers will have fluctuated both naturally and through human impact: it is reasonable to assume that hunter gatherers would have had an impact, reducing deer at least locally and hence encouraging woodland. The impact of pre-historic humans on the post-glacial megafauna shows that even relatively small human populations can have a major impact, even to the point of extinction.

13. As stated in my booklet, summer-only cattle grazing provides optimum woodland regeneration conditions, and is encouraged nowadays, so that the shieling system would be expected to have benefited woodland.

14. I agree that more research needs to be done on goats: I remember how their presence was mentioned in Glen Shiel by Boswell in their tour of the Hebrides. How many goats were there, were they widespread, how were they shepherded, did they preferentially graze crags (where most relict woodland is now found)? How did they cope with wolves? How far away from settlements did they graze?

15. In my view, there is a huge area of mid-altitude upland Scotland away from the coasts and the main straths/glens which are unlikely ever to have significant human populations, at least for lengths of times relevant to ecological impact, and human-induced grazing impact could have been minimal in these locations – although they would have been used for hunting deer??

16. However my thesis does not only relate to grazing, but to long-term changes in soil conditions (e.g. iron pan development), and other tree regeneration conditions. See quote from Svenning on page 2. Conditions are sub-optimal for trees, and grazing can finish them off. But this is a perfectly natural situation: as another example, without the large herds of herbivores in the Serengeti, it would all be forest – and the African plains would not exist!

C. How far can you get without some attempt at quantification of the numbers and size of animals and trees in the premodern period? Let us suppose that you can make an attempt for ca. 1800, by which time (if my calculations are right) around 90% of Scotland was treeless, most of the trees being in the Highlands. Let us suppose therefore that at that time 70% of the Highlands was open space. Then we can conclude that  $x$  numbers of deer equivalent (deer and stock) coexisted with  $y$  area of open space. Would the grazing pressure exerted by  $x$  be enough to account for  $y$  being so high? Can we go back further in time? Not for  $x$ , but perhaps it might be possible to argue that the value of  $y$  had not varied for centuries—ie that there is no good evidence for there being less open land in the late middle ages than in 1800? In the early middle ages? In the Bronze Age? In the Neolithic? The evidence for this has to come in the form of good quality pollen diagrams. Is it there? I have no idea.

17. I do provide some quantification in the Appendix. This relates the grazing level that allows for woodland regeneration to the herbivore carrying capacity. These calculations show it is surprising that there is any woodland! This is the crux of the whole grazing argument: the order of magnitude mismatch between the grazing level low enough for woodland regeneration and the ecological carrying capacity of herbivores. Logically, this would lead to an open landscape.

18. I would have thought unlikely that there was as much as 30% woodland cover in the 1800s, judging from the old maps I have looked at (although I admit it is only a subjective impression). Trees are long-lived and 200 years is not a long time: I would have expected more relict woodlands in the 1960s if there was 30% cover in the 1800s, and a lot more tree remains in peat: they are virtually absent in peat these last 4,000 years. And how could red grouse have evolved (they avoid woodland) if there had not been significant open areas of mid altitude heathland for 1000s of years?

19. The Mar Lodge map on page 8 indicates that in this locality all woodland loss must have happened pre 1703 (the date of the map). A map of Balmacara estate (c1740s from memory), showed, if anything, less woodland than in 1960; nowadays here you can see extensive oak regeneration in deep heather. I have seen sessile oak regenerating in Skye in deep heather in spite of deer grazing. Nearby are a couple of even-aged stands of oak. Hence an oak cycle of regeneration in this area can be as follows: deep heather grows up in an area near the wood; this heather protects some seedlings, which later grow up to produce an even-aged stand of oak; the oak shades out the heather and attracts herbivores; the understorey becomes grassy/mossy; the wood dies, although regenerating elsewhere in the landscape; eventually it reverts to heather and the cycle could start again. This is very similar to Vera's model, except that deep heather is protecting seedlings, not thorny shrubs. However, observations suggest that heather only protects seedlings in certain circumstances: the heather can often outcompete seedlings. In other situations, the bracken understorey can come to dominate, e.g. some Loch Lomond islands: it is impossible to see how the oak is going to regenerate at Inchcailloch in our lifetimes even in the complete absence of grazing, apart from an occasional tree along the rocky shore. But maybe this is where wild boar come in? (although experience with pigs in the Old Wood of Drum shows that the areas scarified by pigs, although providing a seed bed for trees, also attracted deer who ate everything: so it is not that simple).

20. Deer and sheep preferentially seek out woodland, and it is possible that woodland could support higher numbers than open ground. Hence it is difficult to see how any woodland can regenerate if there are grazing animals within it (although lynx would play a part with roe deer). But in Scotland, woods tend to regenerate at their edges, and, most likely, every few years chance events would allow one piece of woodland at the edge to get away, and so perpetuate the wood. This also causes woods to move around the landscape, which is why I have difficulties with the concept of 'ancient woods' – except perhaps in boulder fields, cliffs, gorges and steep slopes. In fact, as an ecologist, I find it very difficult to understand in upland Scotland how any woods survived when herbivores were present: maybe around wolf dens? Or maybe, before leaching had removed most of the nutrients, there were more thorny species to protect trees from grazing? It is only in optimal habitats around the coast, where there is winter-green forage other than trees, that woods can regenerate in today's conditions (which many are doing): coastal woodland is still surprisingly common – and expanding.

21. Hence the balance of open ground/woodland in the landscape will not impact on the carrying capacity, expect perhaps by a slightly increased capacity the more woods there are (which would provide a negative feedback of more trees being eaten); having said, pine trees can acidify the soil and reduce the grazing value,

whereas oaks might increase grass and increase it. Hence it might be difficult to model impact of grazing animals on the proportion of woodlands in the landscape. Additionally, if woodland regeneration takes place at the edges, then it is the length of woodland edge that might be the limiting factor, not the woodland area. There is an SNH report which modelled the fragmentation of woodland, showing that below a certain proportion of woodland in the landscape, then the probability of a woodland dying out increases – which was a justification for many of the woodland network projects (SNH Research & Survey Report 44 rings a bell. I could dig it out when back in the UK). However, I think it was a bit simplistic, and did not take account of the complexities raised here.

22. Even without any herbivores, the dense litter layer of open ground and soil conditions can prevent tree colonisation. Hence there is only a narrow window between high grazing and low grazing which provides optimum tree regeneration conditions: over long time periods, this means that there is a high probability of these chance conditions not persist long enough to maintain woodland – meaning that woodland is likely to become rare in the landscape with a probability of extinction. I did try to produce a graph once to illustrate this, in fact I might have presented it to a SWHDG meeting: I will dig it out.

23. I did do some computer modelling of woodland dynamics a long time ago (as an appendix of the above mentioned birch wood report), which modelled woodlands moving around the landscape and highlighted the risk of extinction. The main conclusion is that if there is a 'core area' with optimum soil conditions and no grazing (a steep slope, cliff or gorge) then the wood could persist in perpetuity: expanding out from the core area in optimum conditions, and retreating back in sub-optimal conditions. Woods without such a core area were prone to extinction. The model was based on the observed principle that woods regenerate at their edges, not in the body of the wood. Regretfully, I never pursued this modelling.

D. One point that interests me is your pointing up the doubtful nature of the Norwegian analogy for Scottish experience. I have been interested in the evidence for extensive forest regrowth in Norway after the Black Death, and its absence in Scotland. If the open land in Scotland was natural, than the collapse of the human population that led to regeneration of forest in Norway would have no such effect in Scotland.

24. Exactly! It can be hard to see why trees are less happy to regenerate in Scotland, but one theory has been put forward by Professor Robert Crawford: in a climate with warm winters but wet soils, trees suffer stress in winter because they still have to respire in the warmth, but anaerobic conditions around their roots mean that the roots cannot cope. In boreal climates, the whole plant is cold and inactive and such stresses do not apply, and snow cover prevents high herbivore numbers and winter grazing.

To me, moving out of the 'woodland as climax' mindset liberates the mind and allows for objective thinking...

I look forward to further discussion of all these points and others too.

Best wishes

Chris

I would like to spend a couple of years researching the issues thoroughly: currently all I have managed to do is to bring together observations (which unfortunately does not count as science these days). It would good also to combine this ecological approach to Scottish woodland with a similar one to the undoubted anthropogenic loss of peatland.

Do you think there would be any institution out there willing to sponsor such a book (although, until I retire, I would have to be paid?!)

<sup>1</sup> Fenton 1985: **The state of Highland Birchwoods**. *Scottish Wildlife Trust Publication*.

A survey of birchwoods in Highland Region (in conjunction with the Scottish Wildlife Trust and Highland Regional Council's Woodland Survey).

<sup>2</sup> 1985: **Regeneration of native pine in Glen Affric**. *Scottish Forestry* April issue.

A study of natural regeneration of Caledonian pine in enclosures (undertaken with the assistance of the Forestry Commission).

Best wishes  
James

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From: T.C. Smout  
Sent: Monday, February 25, 2013 6:10 AM  
To: James Fenton  
Subject: Re: pamphlet

Dear James

I calculated that the woodland cover of Scotland ca.1800 was 9%. I made 'non-open land' up to 30% hypothetically, by adding 20% for cultivated ground in the straths etc, bearing in mind that at that time the Highlands were close to their maximum human population ever. Goats were not as today confined to crags, but a normal part of Highland stock. They were recognised as doing much damage and lairds increasingly forbade their keeping. Sheep could of course overwinter in the Highlands but not in the numbers there were after turnips in the 19th century. See below.

I think Tipping's article establishes the point you originally made that blanket bog was natural, not assisted by people, but a lot of upland ground is dryer peaty moor or grassland, not blanket bog, which could be said to have a better potential for pine and oak. It is here that people will argue (as Bennet does) that the anthropomorphic influence is greatest through burning and stock grazing. Herders would keep the wolves away if they are as shy of attacking people as modern naturalists say. People would also protect the woods from animals if they needed them for house building.

Do take a look at DM Henderson and JH Dickson, *A Naturalist in the Highlands: James Pobertson His Life and Travels in Scotland 1767-1771*. That's the nearest you will get to an 18th century ecologist's view! In Glen Avon: "a man ... will perhaps have 20 Black cattle, 3-4 horses, 20 sheep and 10 goats. During summer and autumn the pastures could maintain thrice the number, but they would perish during the winter or spring". Or again: "In several parts of this country are great plenty of wood such as oak, birch, ash, alder, and trembling poplar, all these would be in great quantities were it not the cattle especially the goats have free access to feed among them" (Moidart). He sees deer near Lairg, on Mull and Skye and in the Cairngorms and provides abundant evidence of domestic stock grazing in woods.

Do you have a larger print version of your booklet? Anne-Marie is anxious to get it reviewed in *Recorder News*, the BRISC newsletter, but she says the print is so small she is not sure she can.

No-one these days pays for books to be written as far as I know, alas.

Best wishes  
Chris

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----- Original Message -----

From: James Fenton  
To: T.C. Smout  
Sent: Tuesday, March 05, 2013 9:09 PM  
Subject: Re: pamphlet

Dear Chris

I have been taking a bigger picture over long time periods – rather than a snapshot of what was observed in a few places over a short period of time: I do not think any of the observations below counteract my overall conclusion.

Indeed some reinforce it: "During summer and autumn the pastures could maintain thrice the number, but they would perish during the winter or spring".

This is exactly my point about ecological carrying capacity: the land can only support so many animals, and if it were not for human livestock, the slack would be taken up by red deer – with the same effect of restricting woodland. Low deer numbers in the 1700s (if they were low) would presumably have been caused by hunting.

"In several parts of this country are great plenty of wood such as oak, birch, ash, alder, and trembling poplar, all these would be in great quantities were it not the cattle especially the goats have free access to feed among them" (Moidart). If it were not for "cattle and goats having free access to the woods" it would be the red deer instead (as we know today – why else do foresters put up deer fences): outcome – the same! Because we 'want' woodland to be climax (either in reality or our minds), then anything acting against woodland must be unnatural: it is like saying the Serengeti plains should be woodland!

I think it possible that woodland expanded locally in the pre-1700s with less livestock present, and deer numbers controlled by hunting – but this is speculation. At Mar Lodge, though, it looks as if the pinewoods there expanded after people and livestock were cleared off the land and before deer numbers built up; to me this is the only explanation for the presence of these woodlands – unless they were planted, which I think is possible as well.

Nobody yet has explained to me ecologically how woodland can be the climax vegetation in upland Scotland in the presence of red deer when we know that the deer carrying capacity is an order of magnitude below that which allows woodland to develop. Can you? Localised woodland can be explained, but widespread, no.

My whole point is that there is a lot of ground (as Bennet notes) that is not peatland as such and which is unwooded (where Tipping's explanation cannot hold true): and my whole thesis is about trying to explain this ecologically – because the landscape nowadays is much the same everywhere, both in places which will have had a long history of human habitation and those with minimal habitation. I would have expected much greater variation in woodland cover across the Highlands and Islands as a whole if it were merely human influence affecting it – rather than the open landscape everywhere. Hence it is probable that human influence has only been one of many influences. The main affect of humans is to manipulate the natural factors of grazing and burning: both activities can either cause a loss or increase in woodland depending on intensity and area.

I think also, because most people travel through the landscape in the straths, and this is where the population generally lives, they generalise from the relatively small area of 'strath' to the whole landscape - resulting in misleading generalisations. Interestingly most woodland today is in the straths - those areas which, as well as having the best soils, also have had the greatest human influence. Hence any estimate of woodland cover made by someone travelling along the main routes would probably result in an overestimate of woodland cover.

The natural vegetation cover of the *bottom* of many flat-bottomed straths and glens would probably have been raised bogs, not woodland (I mention some examples of these relict bogs in my booklet), but these have been lost through burning for peat or clearance of agriculture. Woodland might have been present in some places: I mention the example of Glen Shiel where there has been massive alder expansion in recent years (it was rare before) after a flood – and in spite of heavy sheep grazing.

I suspect, and this is where I would like to research more, that much of lowland Scotland would have been raised bog, blanket bog and heath, rather than woodland. I note that Dr Johnson, even allowing for his exaggeration, (from memory) said he only saw one tree between Fife and Aberdeen. The place names of the area (Muirside, Mossend, etc) indicate the remaining natural vegetation was moorland or peatland: and its open nature could have been due to the same influences as in the uplands??

The general lack of sub-fossil wood in blanket peat to me suggests that trees have been rare in the landscape for at least 4,000 years: if it had been common, there would be expected to more incursion of trees onto peatland in drier interludes (as happens today).

What I would like is for someone to go through each page of my booklet in turn, and respond to the specific points on each page, not to the generalities: it is only when this is done that the story I am trying to tell emerges.

I still think that the opening up of the landscape in previous interglacials (without humans) makes it irrefutable that decline in woodland on acid soils can be a natural process. So I am not sure why there is such resistance to the theory?!

Best wishes  
James

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From: T.C. Smout  
Sent: Friday, March 15, 2013 6:06 PM  
To: James Fenton  
Subject: Re: pamphlet

I suppose there is scepticism as to whether the present pressure of deer numbers on woodland is what would have been the case in early prehistory when deer were not fed in winter by kind estates and wolves and lynx abounded to keep their numbers low. Under those circumstances red deer might not have been able to eat all the regrowth and they might have lived in forests as they do elsewhere in Europe. Your argument depends on the climate and soil of Scotland since later prehistory being of such a character that a much lower density of deer would have the effect you require-- Have I understood that right?

But you should write it all up as a book or at least as an article in something like *Conservation Biology*. You should not leave it where it is or how will people find it?

Best wishes  
Chris

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----- Original Message -----

**From:** James Fenton  
**To:** T.C. Smout  
**Sent:** Friday, March 15, 2013 10:21 PM  
**Subject:** Re: pamphlet

Dear Chris

The issue of deer numbers is where the Appendix in my booklet comes into play, which shows the calculated populations of wolves and deer (and sheep and cattle) based on current vegetation productivity - nothing to do with winter feeding (although winter feeding can take pressure off native vegetation, including trees, so the picture, even here, is not simple). The current high level of deer shows that the vegetation can support it, and there is no reason to indicate why this cannot always have been the case. My argument is that woodland declined even in the presence of wolves.

In terms of wolves, there is always debate as to whether predators determine prey numbers or vice-versa, but my Appendix takes the theoretical 90% difference between trophic levels (i.e. predators at 10% level of herbivores). Lynx might have controlled roe deer, but not red deer.

If carrying capacity applies to livestock, it applies to native herbivores as well. And wolves were present in the 18th Century, although how many and where is uncertain - probably rare?

I have had the issues published in 'Plant Ecology and Diversity' (reference in the booklet). I did try 'Conservation Biology' but they rejected it, partly on length and saying it would be more appropriate as a book, and partly because mere observation does not count as science these days! This is why I produced the booklet as you cannot argue with photographs (and nobody has as yet, instead side-stepping what they show). I agree the booklet needs more publicity, but unless I can garner up more support, I will retire as a grumpy old man, sad that one of the most natural landscapes remaining in Europe is being modified to fit in with our anthropocentric wishes!!...

However, having written it as a booklet, I might day write it as a book - although this cannot happen until I retire, and depends on whether I have the energy to continue with a lost cause...

Best wishes  
James

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**From:** T.C. Smout  
**Sent:** Saturday, March 16, 2013 11:48 AM  
**To:** James Fenton  
**Subject:** Re: pamphlet

No wolves in 18th century Scotland-- all went in 17th century. The story of the Last Wolf in Scotland from Speyside comes from the Sobieski Stuarts and is fantasy. For this see Derek Yalden, *History of British Mammals*.

But lots of blanket bog in the Lowlands before 1800 -- even round here in East Fife there was a big bog between Crail and Anstruther in the middle ages. It would be an interesting exercise to compare the number and distribution of bog/moor names against wood names, but it would need an expert like Simon Taylor to do it thoroughly.



I don't see why feeding deer in winter does not increase their numbers-- if it doesn't do this, why do landowners go to the expense of feeding them? Could it not be argued that the current high level of deer shows that vegetation can support them all in summer when it is growing, but not necessarily in winter when it has died back? And that the effect of artificial winter feeding will be to allow a larger number of deer to survive to eat more vegetation in summer than they would naturally?  
You should write this book whatever happens-- if you are right, you will eventually be believed.

Chris

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---- Original Message ----

From: James Fenton

To: T.C. Smout

Sent: Tuesday, March 19, 2013 12:44 AM

Subject: Re: pamphlet

Thanks for the correction about the wolf - but it was around for all but the last part of the post-glacial period.

As for winter feeding, its impact on a given estate depends on the current deer number. My calculations in the appendix suggest a carrying capacity of c.80/sq km, which is a lot of deer. So if the total number of deer on an estate is below this level, winter feeding may increase winter survival but will not necessarily take the numbers above the carrying capacity. If the deer number is at the carrying capacity (maintained by mortality which might be expected to be highest in winter, although a wet summer could increase mortality), then winter feeding could result in a higher deer population than the natural carrying capacity.

On the other hand, winter feeding might result deer eating less natural vegetation, including young trees, i.e. take pressure off sensitive habitats (diversionary feeding, on the same principle that feeding sea eagles meat reduces pressure on lambs). However, location of winter feeding is also important: if it is near areas of native woodland, then it can bring more deer into the area, causing localised increased grazing on young trees (although possibly less grazing elsewhere).

Deer do tend to shelter in woodland in winter, so it is hard to see how there could ever be significant tree regeneration in natural systems, apart from episodic events brought about by deer disease events, extreme weather or high winter snow cover. High winter snow cover might have been the situation during the Little Ice Age, causing a short-term increase in woodland cover??? It is in winter when deer and sheep are hungriest that young trees are under most threat from grazing, especially those that stick above the average vegetation height.

Wolves might be expected to allow localised tree regeneration also, e.g. around wolf dens.

As I think I have said before, the loss of Scotland's lowland bogs (blanket, raised or intermediate) has had, in my view, much more impact on the landscape than loss of woodland - and is still a story waiting to be told (but appears to have less resonance with us than woodland loss, which I put down to our atavistic woodland primate past?; or perhaps the rationale discussed in Jay Appleton's 'The Experience of Landscape!'). I remember been amazed in Sandy Fenton's book 'The Northern Isles' about the amount of peat exported per year from Orkney to Scotland; and of course there is the story of the clearance of the moss stretching from Stirling to Aberfoyle, of which the current Flanders Moss is but a small relict. Auchinforth Moss is a relict of what the landscape would have looked like south of Edinburgh. And in the Carse of Gowrie, I imagine Inchtire and Inchmichael were islands in an area of peat? I think it most likely that the Black Isle was so called because it was black peat moss, but you have to look very carefully now to see any relict peatland. The Laigh of Moray was of course all bog and fen before drained by the Dutch; and there are one two relict bogs still between Elgin and Inverness. And the relict bogs in Fife, and the name 'Peat Inn'...

I imagine that much of lowland eastern Scotland was moss. It is only in the Flow Country of Caithness that you can see what the natural vegetation of lowland eastern Scotland would be like without human colonisation? Although there never any native trees to complicate the picture, a large percentage of the Falkland Islands are underlain by peat - and this at a latitude of only 52 degrees and a drier climate than Scotland.

So yes, the story of Scotland's lowland bogs is one waiting to be told, and more relevant to landscape change than loss of woodland?

Best wishes

James

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From: T.C. Smout  
Sent: Tuesday, March 19, 2013 7:59 AM  
To: James Fenton  
Subject: Re: pamphlet

I would not doubt for a moment that there was much more bog and certainly much more Lowland moorland around 2000 years ago than today, and that there was more around in the middle ages than today. The problem as always is discovering even approximately how much. Place names can tell you only that bogs and moors and woods were there, but not much else : they may even be given because they were relatively unusual features. You can argue that you don't call a place Muirton if all the settlements are in on the moors, but to distinguish it from Bonnyton which was not. Peat Inn might demonstrate the shortage of peat -- you wouldn't call somewhere Peat Inn in Harris.

But the general point about the prevalence of open moor and bog is true enough. The east of Fife between Anstruther and St Andrews is divided between Kingsmuir and Priormuir, and Adair's map in the National Library of ca.1680 seems to show most of it as rough ground, of which barely a trace now remains. But moor is not blanket bog. Was that moor original-natural, or covered with trees 5000 years ago, since destroyed by agricultural grazing? Can one tell anything from the soil -- all that 'brown forest soil' beloved of soil scientists, where did that come from? I ask not to make objections to your hypothesis but because I don't know!

There is no evidence of an upsurge in tree cover in the Little Ice Age, but rather the reverse, which I take to be the result of increasing wet and strengthening winds. Just about all the vanished historic pinewoods in Scotland (woods of which we have previous documentary evidence, not the prehistoric ones) went at this time. There is only about a dozen of them, but they are all either high up or in the west. It is said that across Europe the treeline dropped substantially at this time.

Best wishes  
Chris

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From: T.C. Smout  
Sent: Monday, July 08, 2013 1:41 PM  
To: James Fenton  
Subject: New Paradigm

Dear James

I am impelled by the latest *Scottish Forestry* and a piece by the Trees for Life man within it, to urge you again to make your 'New Paradigm' more accessible, for example by writing an article based on it for *British Wildlife*. It is too obscure a fate for it to remain on the web unseen, unappreciated and unassessed by knowledgeable critics. I think it has the potential to change the way the Highlands are managed.

Just off on holiday--

Very best wishes  
Chris