

Upland Sheep Farming and the Environment

Dr James Fenton, 16 December 2013

Note that in this article I am referring to the impact of sheep farming on the unimproved hill land, not the inbye land. I am also referring here primarily to the uplands of Scotland, particularly north of the Central Belt – I hesitate to say how much will apply to the other upland areas of Britain and Ireland.

Sheep – friend or foe of the environment?

Sheep have often had a bad press in conservation circles. How many times have you heard sheep blamed for destroying the woodlands that once clothed upland Scotland? Or of overgrazing damaging habitats and devastating landscapes? For example, in a recent article in *The Spectator* 'Meet the Greatest Threat to our Countryside: Sheep', the environmentalist George Monbiot states: "We pay billions to service a national obsession with sheep, in return for which the woolly maggots kindly trash the countryside. The white plague has caused more extensive environmental damage than all the building that has ever taken place..." George Monbiot, the reforestation lobby generally and the rewilding lobby would like to see our uplands returned to their natural state which, in their view, means covered in trees.

However in recent years a contrary view has emerged, promoted in particular by the European Forum for Nature Conservation and Pastoralism. This is the concept of High Nature Value Farmland, land which in Britain largely equates to the unimproved hill land containing semi-natural and natural vegetation, i.e. the hill farms and common grazings. In practice the vegetation here may have been modified to a greater or lesser extent by sheep grazing and associated muirburn but it does comprise plant communities that would occur naturally in that locality. Recently, in relation to CAP reform, a consortium of organisations, including many conservation NGOs, wrote to the Scottish Government seeking greater support for hill farmers so that they can continue to farm in the extensive manner that maintains the value of this high nature conservation land.

So which view is correct? Is sheep farming responsible for damaging the environment, particularly through removal of the trees and shrubs that should naturally be there, or does it result in land of high conservation value?

To answer this, we need to answer the question: "What would Scotland be like if sheep had never been introduced?", i.e. have they been responsible for eating all the trees so that without them Highlands would be forested. In my view the answer to this would be that our uplands would look much the same, sheep or no sheep – and this is for several reasons.

Firstly, the number of grazing animals that a given area of land can support is determined primarily by the productivity and palatability of the vegetation present. The maximum number is determined by the food available in the months without plant growth, which in Scotland is winter and early spring. In nature, grazing animals will tend to increase until this carrying capacity is reached, and if there are too many they will die – as can be observed today in the unmanaged sheep flocks on St Kilda. The main native herbivore in the uplands is red deer and, because the grazing impact of sheep and red deer is

similar, if sheep had never been introduced then deer would have continued to graze the hills at their carrying capacity. Sheep merely replaced deer. This might explain the fact that red deer numbers in Scotland have increased in recent years – they are taking over the now unutilised grazing as sheep numbers have fallen. However, although deer numbers are going up, the overall grazing impact on the landscape is possibly not changing. Some ecologists argue that the lack of predators (i.e. wolf) would have kept deer numbers down below the carrying capacity, low enough, in fact, for trees to be able to regenerate. However the order of magnitude discrepancy between the density of deer that the vegetation can carry (around 80/sq km) and the density which allows woodland regeneration (5-8/sq km) suggests that this would not be the case. In any case deer are predated – by stalkers, at an average of 13% of the deer population *per* year: predators would have to eat more than 13% of the deer population, which seems unlikely. In summary, grazing by large herbivores would have been a natural facet of the landscape, and the replacement of the native herbivores (red deer) by introduced herbivores (sheep), has probably not made much difference.

Secondly, because of the specific climate and soil conditions, there is a propensity on flat and gently sloping areas for peat bogs to develop: research suggests this would happen regardless of whether there was grazing or not. Hence the large open peatland landscapes, such as now found in the flow country of Caithness and Sutherland and on our smoother hills, represent a natural vegetation type largely uninfluenced by sheep.

Thirdly tree regeneration can sometimes be observed even in the presence of very heavy sheep grazing – the sheep are just not eating the young trees. For example, Hebridean sheep were at one time brought in by the National Trust for Scotland to prevent the heather moorland of Culloden Battlefield scrubbing over. However, although the sheep ate some species of tree, particularly rowan and willow, they left the birch and pine largely untouched: the woodland was expanding even with heavy grazing. I have observed this situation in several localities, particularly low altitude sites in the west. Here it is probable that the presence of wintergreen herbage takes the pressure off tree browsing, allowing woodland to regenerate. Grazing and trampling by sheep also provides good germination sites for tree seedlings – which is why an intense burst of tree regeneration is often observed when grazing is relaxed. Hence, although sheep grazing may prevent woodland regeneration in some sites, it is not universally true that the presence of sheep destroys woodland.

Woodland naturally rare in the landscape

Conservationists in Britain have tended to see high grazing levels as bad thing, probably because they have been focussed on woodland and on the myth that upland Scotland 'should be wooded': everything is focussed through the prism of woodland regeneration. Sheep destroyed the woodland, so the theory goes, so sheep must be bad for the environment. But, as the Historiographer Royal Professor T C Smout states in his book *Nature Contested* with respect to the Great Wood of Caledon: "It is, in every sense of the word, a myth." It was in fact the eminent geographer, James Geikie writing a far back as 1866 who concluded: "As it can be shown that the destruction of our ancient forests has not been primarily due to man..." If the woods were never there during the period when the large-scale sheep farms were first created, then the sheep cannot be responsible for their demise. Before the era of large farms, it would

not have been possible to keep large flocks in the hills, particularly the remoter areas, because there were still wolves in the landscape.

If one moves away from the mindset that the uplands would be wooded in their natural state to the mindset that the openness of our hills is a perfectly natural state, then this liberates the mind to a realisation that upland grazing is a perfectly natural situation. Admittedly in the natural state, grazing would be predominantly by red deer than sheep, but, as stated above, the grazing preferences of the two species are not hugely different: if anything, deer do more damage to trees than sheep.

In many parts of the world it is natural for the landscape to be kept open by grazing animals, particularly in environments where the soils and climate are sub-optimal for tree regeneration (which is the case in upland Scotland): witness the Serengeti plains of Africa, or the American prairies where, in the old days, huge herds of buffalo kept the prairie open. There is no *a priori* reason why numbers of grazing animals should be low in natural systems. Quoted recently in *New Scientist*, environmental historian Jed Kaplan states in relation to the openness of some natural landscapes: "It is important to keep in mind that landscape is also shaped by animals". Even the presence of predators does not necessarily lower numbers of grazers enough to allow tree regeneration: there are a lot of predators, for example, on the open Serengeti plains and, closer to home, woodlands in upland Scotland naturally died out in eras when wolves were present in the landscape.

I am of necessity making gross generalisations here which, because Scotland is a diverse country, will not hold true everywhere. For example, woodland can be seen to be expanding in parts of Scotland even with very high grazing, mainly those low altitude areas of the southwest Highlands where the soils are better and natural colonisation of pasture by the prickly shrubs bramble, hawthorn and sloe allows trees to colonise without being eaten (the Frans Vera hypothesis). And, as I have already mentioned, coastal woodlands on the west coast can expand at times even in the absence of thorny scrub because there is enough wintergreen herbage for the sheep. However most of upland Scotland has soil types unsuitable for these species so it is perhaps not surprising that the landscape remains open and unwooded.

Overgrazing or not?

There has been much talk in conservation circles about overgrazing causing habitat damage in the uplands, nowadays particularly in relation to red deer (often accompanied by the statement 'there are too many deer'). In fact the term 'overgrazing' has little meaning except in respect to a desired outcome: it is just that different grazing levels result in different vegetation types. If woodland regeneration is the aim and grazers are eating the young trees then this is overgrazing with respect to woodland; but if woodland is not a desired endpoint, then it will not be overgrazing. If maintenance of heather is a desired outcome, then grazing at a level that will cause heather loss will be overgrazing with respect to heather. However, observations suggest that heavy sheep grazing will only cause heather loss on richer soils, which, in any case, will be providing a sub-optimal habitat for heather. On St Kilda, for example, where there is unregulated sheep grazing, there is no evidence of heather loss.

The word 'overgrazing' on its own has little meaning for natural systems because it is based on a human value judgement. We all know that in Scotland there is an excess of edible herbage in the summer

months – at even the highest grazing levels it cannot all be eaten – so overgrazing is impossible. And in winter it is impossible because the animals will die; this, admittedly, is from an ecological perspective. If animals are dying, then this will be overgrazing from a farming perspective.

If grazing is reduced to a very low level, for example to encourage woodland regeneration, then this can cause the general vegetation height to become taller, with many smaller grazing-dependent plants disappearing: generally, the higher the grazing level the greater the number of vascular plant species per square metre. Grazing encourages plant diversity. It is true, though, that some grazing-sensitive plants may disappear with heavy grazing, or at least become confined to inaccessible cliffs and slopes: but this surely is a natural situation? As an aside, some Scottish upland woods can have a very low floristic diversity compared to nearby grazed areas.

Additionally, lower grazing levels will cause a build up of dead plant litter, will reduce nutrient cycling, encourage soil acidification and peat development, and generally lower the fertility of the soil and the landscape. However, reducing the number of sheep will not necessarily reduce the grazing pressure on the best grassland, particularly if this comprises a relatively small percentage of the holding, as sheep will always tend to concentrate here. In practice, as all sheep farmers will know, the intensity of grazing can vary enormously across the hill, the best grassland grazed low and poorer ground remaining virtually untouched.

Certainly high grazing levels can result in some localised damage or erosion through trampling, particularly if rabbits are also present, but this likely also to be case also with natural systems: some degree of erosion can be seen as a natural process. Interestingly, a suite of reports commissioned by SNH in recent years on habitat condition in the uplands has not, at a strategic level, identified ‘overgrazing’ as a major issue – unless woodland regeneration is being sought. One report published in 2010 (SNH Commissioned Report 402), recognising that a range of different habitats occurs in the uplands, concludes “It may therefore be hard to devise a management regime that will maintain all the habitats in a favourable condition.” The natural state of our uplands is of course to be unfenced, so this report is really stating that it is impossible to keep all habitats in favourable condition at once without fencing each one separately – and who wants to see yet more fencing compartmentalising our open hills? This, presumably, will also apply to the areas of the Highlands where it is a natural system with red deer instead of sheep as the dominant grazer. It would appear that there is an almost Darwinian ‘survival of the fittest’ selection for the habitats which can survive, and habitats that we as humans may cherish or find useful, such as woodlands, may not be necessarily part of the natural scene.

Muirburn is an activity traditionally associated with sheep farming, and it is true that, unlike the grazing animals themselves, repeated muirburn can cause environmental damage. However, this issue is not discussed here where the focus is on grazing impact.

The importance of upland sheep farming

The above discussion suggests that extensive sheep farming is more likely to maintain ‘high nature conservation land’ than to cause environmental damage. The open landscapes of upland Scotland contain habitats rare on a European scale – the oceanic dry and wet heaths, peat bogs, species-rich

grassland – and sheep grazing helps maintain them. The ideal from a nature conservation perspective would be conservation of these areas through maintaining the complete natural ecosystem, with grazing from red deer rather than sheep. However, if put into practice, this would mean the loss of upland farming, with the associated loss of jobs, culture and a rural way of life. By ensuring the continuation of extensive upland farming, the conservation of these areas can be assured, thereby maintaining the distinctive Scottish landscape of open hills and moors.

However, as we all know, the future of upland sheep farming remains fragile. And if sheep farming is lost in these areas then the likely outcome will be forestry: the Scottish Forestry Strategy commits the Government to a target of 25% of Scotland being covered with trees, which, if arable land and improved pastures are excluded (we need to grow food) rises to 33% of the remaining landscape – and it will be even higher if deep peat, mountain tops and other unplantable land is excluded. In practice the only land available to achieve this target is on our upland farms and sporting estates. The loss of such farmland can be seen in Galloway, for example, where the remaining unimproved moorland, particularly that in the lowland and foothills of Galloway, tends to be the focus of new woodland schemes. This is resulting in the loss of the distinctive Galloway landscape of open hills and moors interspersed with rocky outcrops and green fields; the end result will be intensive farmland on the best ground and woodland elsewhere, with areas of moorland habitat disappearing and an associated loss of species and diversity. Birds characteristic of open ground such as golden eagles, red grouse, larks and waders are of course particular prone to disappear when the moorland is planted up.

I will finish with a quote from SNH's own 'Landscape Policy Framework' for Scotland.

"SNH's overarching aim for Scotland's landscape is as follows: To safeguard and enhance the distinct identity, the diverse character and the special qualities of Scotland's landscapes as a whole ... this means working to ensure...

- an enhanced contribution of forest and woodland to many landscapes;
- distinctive landscapes of upland, hills and moors, recognised for their openness and quality of wildness..."

Hence, although SNH recognises that there is a place for more woodland in the landscape, their key aim for the hills and moors is to retain their openness. Upland sheep farming surely has a key role to play here.

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