Scottish Natural Heritage’s Scoping of An Upland Vision
Suggestions from Dr James Fenton, October 2016
ecology@fenton.scot

WHERE ARE THE UPLANDS?

1. What broad characteristics should we use to define the uplands?

It is not sensible to define the area based on altitude because in common parlance the term ‘uplands’ includes land at sea level, as shown, for example, when we refer to ‘The Highlands’. In practice it means ‘land of a hilly nature’ and includes land at all altitudes.

In fact any definition based on a single characteristic has its limitations. The defined area is also dependent on what aspects we hope to include in the vision. If it is only to refer to the conservation and management of unimproved, upland vegetation then it makes sense to define the area as the land above the head dyke. However, if it is to include social and economic considerations then a wider definition is needed. In this case the use of the Less Favoured Areas [Severely Disadvantaged Areas] as the definition makes sense, although, as noted, this includes areas, which are not upland in character, such as parts of Galloway.

Additionally, there are different kinds of upland: the small scale hills which arise above the lowlands, such as the Cleish Hills, have a different suite of issues than landscapes which are upland in nature throughout.

Because the uplands are generally dominated by natural or semi-natural moorland vegetation, and in the lowlands such moorland has been lost through agricultural improvement, then the current location of moorland provides a good indication of landscapes of an upland character.

Hence it is suggested that the uplands here defined as landscapes where “open moorland is the dominant vegetation type” as delineated on Map 1. Note that ‘moorland’ includes vegetation types found at sea level in addition to those exclusive to high altitudes. Evidence suggests that moorland would naturally be the dominant landscape over the majority of the Scottish uplands¹, so basing a definition on moorland will also encompass the most natural areas remaining in Scotland.

This is not a perfect definition because in some areas, particularly Galloway and Argyll, forestry or woodland plantations now dominate a landscape which would still naturally be moorland (see Map 3). Hence Map 1 includes these afforested areas. Additionally, there are some localities within the larger areas of ‘uplands’ (Type A below) where there is a significant presence of agriculturally-improved land, such as Mainland Orkney or the Campbeltown area.

¹ See, for example, Towards a New Paradigm for the Ecology of Northern & Western Scotland, 2011.
https://www.fenton.scot/new_paradigm.htm
SCOPING A STRATEGIC VISION FOR THE UPLANDS: SUGGESTED UPLAND AREAS

James Fenton October 2016

Map 1. Suggested 'Upland Areas'
Map 1 indicates two broad categories of upland:

**TYPE A. Large-scale landscapes with upland character throughout**
1. Highlands & Islands
2. Southern Uplands
3. Galloway Hills

*Note: The Galloway Hills and Southern Uplands could be combined as one unit, although there are differences between the two areas.*

**TYPE B. Localised hills arising above landscapes of intensive farmed or urban land**
4. Hill of Fishie
5. Sidlaws
6. Ochils
7. Lomond Hills (could include Benarty Hill)
8. Cleish Hills
9. Campsie, Kilsyth & Gargunnock Hills
10. Clyde Muirshiel Hills
11. Lammermuirs
12. Screel & Criffel

The need to scope different visions for the different areas

SNH’s *Hills & Moors Assessment*\(^2\) recognises the diversity of Scotland’s uplands: “Policy stances on the uplands have to take into account the huge diversity in our hills, from the sheep walks of the Southern Uplands – now extensively afforested in some areas – to the exposed northern moors and rugged mountains, which are of very low productive potential.” It is not possible to produce a single vision to cover all the uplands in Scotland.

Visions for the large-scale landscapes will of necessity need to encompass the three pillars of sustainable development: sustaining the communities, the economies and the natural environment\(^3\).

For the smaller areas, the vision will only need to focus on the third pillar, i.e. the conservation of the remaining areas of high nature value (the remaining natural vegetation) and high landscape value. This is because these are the last remaining moorland in lowland Scotland and its loss would reduce the overall landscape value of Scotland, and much of the economic and community aspects will be maintained on the low ground outwith the actual upland. This is reinforced in the *Hills & Moors Assessment*\(^2\): “Scotland's hills and moors often form the foreground or background to other settings which are in more intensive use. Most of Scotland's cities and large towns have hills and moors not far away – a visual and recreational resource of high value to people living in urban settings. Urban-related pressures and development can press heavily on these moorland settings and have widespread visual impacts. The landscapes of these 'hills of home' deserve special care for their social value to adjacent communities.”

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\(^3\) See, for example *Sustainable Development: From Brundtland to Rio 2012,* published by the United Nations, September 2010.
WHAT BENEFITS DO THE UPLANDS PROVIDE TO SCOTLAND?

2. What are the key social, economic and environmental benefits that the uplands provide?

The benefits below are an edited and expanded version of those given in *New Life for the Hills*:

- Abundant resources of water, and considerable reserves of rocks and minerals of commercial value.
- Natural energy flows for energy production (wind, water, tide, waves)
- Largest store and sink of UK terrestrial carbon.
- The [UK] uplands carry a larger flock of sheep than other EU country. They provide a genetic reservoir of hardy sheep and cattle, supplying high quality store and breeding livestock to lowland farmers.
- The majority of managed productive forest, and the major potential for further afforestation, in addition to supporting an important element of the nation’s remaining indigenous woodland.
- National significance for the conservation of natural habitats and species.
- National significance for outdoor recreation and field sports of many kinds which cannot be pursued in the lowlands.
- Their unique landscapes provide the basis for a major part of the tourist industry.
- Popular locations for second and retirement homes, and satisfy certain requirements for military training.
- They offer opportunities for education and research in conditions where man’s influence with nature has been relatively limited.
- Iconic of Scotland and source of much of Scottish culture.

Note that flood amelioration has not been included in the above benefits because the uplands, with their high hills, attract clouds and rain and are the cause of floods. Vegetation type will not influence extreme flood events, such as the Muckle Spate of 1829, when the water storage capacity of the vegetation and soils is full, although vegetation type may lower the risk of summer flooding in some instances (although objective research on this in Scotland is limited). But overall, a landscape type which predisposes the lowlands to floods cannot have ‘flood amelioration’ as a benefit!

3. How can upland land use help to prevent or reduce the impacts of climate change?

Renewable energy

Replacement of fossil fuels by renewable energy can in the long term mitigate climate change and upland Scotland has some of the highest natural energy flows in the UK. However a significant proportion of this resource has already been exploited and further exploitation will erode many of the other benefits which the uplands provide. For example, Map 2 below shows the distribution of windfarms (red), and shows that in some areas, particularly southern Scotland, saturation has been reached – a conclusion reached, for example, by 50 Community Councils in Dumfries & Galloway Council.

There is no national database of hydro schemes, but such schemes with their associated

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infrastructure can now be found throughout Scotland, with, for example, tracks now being bulldozed into the heart of the Torridon mountains.

Future renewable energy infrastructure must not compromise the other benefits listed above which the uplands provide. In particular the loss of wildness and landscape quality has been seen as key issue in all reports into the future of the uplands since the 1980s (see response to Question 4 below). Hence the time is being reached when there is little future potential for further wind and hydro schemes so that future climate change mitigation is limited.

**Tree planting**

Although tree planting is often put forward as a way to mitigate global warming, in practice it is unlikely to do this in upland Scotland for two reasons:
1) Most upland soils are carbon rich and the drying effect of trees on the soil can release this carbon.
2) Trees have a significantly lower albedo (reflectivity) than open ground vegetation and hence their presence warms the surrounding air.

1) **Carbon storage**

The Royal Society of Edinburgh has concluded⁶: “Trees naturally grow peaty podzols and peaty gleys, but new planting on these soil types would, if used, require to be sensitively handled to minimise carbon loss in the short term. No tree planting should take place on peat, and removal of standing timber should be done by low impact machinery … The areas of high carbon soil, particularly deep peat, are well known and these should be protected as a strategic resource for carbon storage.”

Observations today suggest that trees continue to be planted on peats. In practice shallow organic-rich soils have the best long-term potential for sequestering carbon and, so should be protected from tree planting, because deeper peats are in time more likely to naturally erode (see peatland section below).

2) **Albedo (reflectivity)**

A conclusion from several papers and reports is that planting trees away from the tropics in northern latitudes can actually exacerbate global warming through the trees absorbing more heat than equivalent open ground. For example the Intergovernmental Panel on Climate Change (IPCC) has concluded: “The albedo of agricultural land can be very different from that of a natural landscape, especially if the latter is forest. The albedo of forested land is generally lower than that of open land because the greater leaf area of a forest canopy and multiple reflections within the canopy result in a higher fraction of incident radiation being absorbed … The effect is particularly accentuated when snow is present, because open land can become entirely snow-covered and hence highly reflective, while trees can remain exposed above the snow (Betts, 2000). Even a snow-covered canopy exhibits a relatively low albedo as a result of multiple reflections within the canopy (Harding and Pomeroy, 1996). Surface albedo change may therefore provide the dominant influence of mid- and high-latitude land cover change on climate (Betts, 2001; Bounoua et al., 2002).”⁷

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Map 2. Distribution of windfarms within the Upland Areas’
Also: “... in many boreal forest areas, the positive forcing induced by decreases in albedo can offset the negative forcing that is expected from carbon sequestration. Some high-latitude forestation activities may therefore increase climate change, rather than mitigating its impact.”

In Scotland, although snow cover is variable, much of the upland area has a low albedo in winter owing to the abundance of pale coloured dead *Molinia*.

The above issues makes it very questionable whether tree planting in upland Scotland will in fact mitigate global warming as widely stated. Taking a precautionary principle, there ideally should be a moratorium on new planting until more definitive answer on the impact of trees has been arrived at. Additionally, because tree planting reduces the naturalness of the landscape, any moratorium would also conserve the areas of highest biodiversity, i.e. the remaining natural landscapes.

**Peatland & carbon storage**

The uplands hold the UK’s largest store of terrestrial carbon (most in Scotland) and release of this carbon would exacerbate climate change. The vast majority of this carbon is in the soil as peat or humus. However peatland itself goes through natural cycles of growth and erosion, with a greater probability of erosion the greater the depth of peat. For example, Foster *et al* state: “... the potential for substantial carbon loss arises as both enhanced decomposition and erosion may remove peat ... Mires in most boreal regions are inherently unstable, and dissection is the apparent endpoint.”

The evidence in Scotland suggests it is also the case for temperate peatlands in Scotland.

Erosion of peat is multi-causal and can be caused by human activity such as the construction of agricultural drainage ditches (moor grips). In this case it is relatively straightforward to restore the peatland and action to restore the peat growth to sequester carbon makes sense. However, owing to the extent of peatland in Scotland, it is in practice impossible to stop the natural growth/erosion cycle and eroding peatlands will continue to liberate stored carbon. However what is possible is to encourage peat growth on the shallow organic soils which have the greatest long-term potential for carbon storage – primarily through preventing drainage, agricultural improvement or tree planting.

It is often stated that deer and livestock are a major cause of peat erosion. However, research published by SNH concludes: “No significant relationships were identified between the area of eroded peatland vegetation and the densities of large herbivores across Scotland as a whole,” although more research is needed. Although there are likely to be some instances where erosion is instigated by animals, peat erosion is caused by a multiple of factors and there is no clear need to reduce deer or livestock numbers to benefit carbon storage.

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10 James Fenton, in prep. See, for example, From pools to peat hags: the later stages of peat bog development. [https://www.fenton.scot/peat_bogs.htm](https://www.fenton.scot/peat_bogs.htm)

Burning
Fires are a natural feature of the upland landscape although human activity has undoubtedly increased their frequency. Burning does have the potential to reduce carbon sequestration owing to plant litter being burnt rather than being incorporated into the soil; and in out-of-control fires, where the humus or peat itself catches fire, they have the potential to liberate stored carbon. However there are a lot of variables to consider and SNH’s recent Review of Sustainable Moorland Management\textsuperscript{12} concludes that more research is needed on this topic.

WHAT SHOULD AN UPLAND VISION INCLUDE?

4. A strategic vision could inform decisions about the balance between different land uses in different parts of the uplands. What are the key choices that an upland vision should address, and why?

Declining landscape quality
SNH’s Hills and Moors Assessment\textsuperscript{2} states: “Scotland’s uplands are dominated by spacious open vistas of great natural beauty, and by bold and often rough landforms, all of which contribute to the strong sense of wildness and drama in the landscape. This openness can make it difficult to accommodate development, yet there has been a growth in the numbers of buildings and other constructions in the uplands, often of a quality which is not as high as it should be. The extent of remote and wild areas has been diminished, and exploitation of the natural resources of the hills has led to large or obtrusive new structures, such as dams, pylons, masts, plantations and bulldozed roads ...

“The aesthetic quality of open moorland landscapes is very high: these are distinctive places, especially the peatlands of the north and west, which are places of solitude and naturalness, which derives from their near-tundra vegetation cover and their inaccessibility. But in other hill areas, muirburn patterns make clear the degree of human use of the moors ...

“The distinctive character of these landscapes is then especially sensitive to development which is not designed and sited to a standard fitting for its location – but in some locations any development will be difficult to accommodate.”

The loss of landscape quality has been going on for a long time. For example, one of the main findings of a survey of the English uplands in 1983 was:

“In many areas the uplands are becoming less attractive as characteristic landscape features are lost and replaced by new and less valued ones”\textsuperscript{13}.

This is reiterated in SNH’s Hills and Moors Assessment\textsuperscript{2}: “There is a long history of human use of the upland landscape. Many of the more recent developments have sought to promote a stronger economy in the remoter areas, and considerable social gain has been achieved, albeit with less local benefit in employment than promised - as in forestry and hydro-power generation. But there has usually been a cost to the quality of the landscape ...”


Related to the loss of landscape quality is the observation in the SNH assessment: “Communities and individual owners and managers in the uplands depend, one way or the other, on the management and use of the natural heritage. But many of the local businesses (especially in tourism) now depend on the hills, but are detached from the need to care for the resource on which their trade depends.”

The disconnect between how the landscape looks (its landscape quality) and the main drivers of change is a key issue: maintaining landscape quality to date has always been secondary to other issues.

Hence a key aspect of the vision must to give landscape pride of place, and to ensure there is no future loss of landscape quality – and to ensure national policy does not override local concerns.

**Issues identified in the 1990 Mountain Areas of Scotland report**

There have been numerous inquiries into the state of the uplands over the past few decades, some of which have been referred to above. A common theme throughout is the loss of landscape quality. Many of the issues identified by the then Countryside Commission for Scotland in its *Mountain Areas of Scotland* report are still relevant to any future vision for the uplands. The problems identified in 1990 were:

1. The quality of decision taking on rural land use change was widely criticised [by consultees].
2. The process of transfer from one rural land use to another is perceived by consultees to be not sufficiently open to democratic control.
3. Still on quality, there is clear concern from consultees that the design and location of new development in upland areas fails to rise to the standard required for landscapes of the highest importance.
4. Conflicts are perceived to occur between different land uses … The lack of a mechanism for mediation is again a factor.
5. We may be demanding too much of our mountains.
6. Land managers in the uplands are criticised for not paying sufficient regard to ecological principles and values [related mainly to new forestry].
7. The incentive systems for land management in the uplands are regarded as not meeting today’s needs.
8. There was widespread discontent amongst consultee that wild and remote land is under threat and lacking protection.
9. The quality of provision for visitors to Scotland was also criticised [still the case?]
10. There is little strategic vision in the way in which we manage tourism, such as the provision of information or access to high and fragile land like the Cairngorms.
11. Over-emphasis on tourism can bring problems for communities in sparsely population areas.

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14 *The Mountain Areas of Scotland*. Countryside Commission for Scotland 1990
Map 3. Landscape designations in relation to upland areas, showing moorland, woodland and urban.

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Pressures on the uplands which the strategic vision will need to reconcile
The following are the current drivers of change in the uplands, which will have to be reconciled in a given locality if the uplands are to remain an attractive place in which to live, work or visit:

**Increased accessibility:** faster road links to remote areas; the ever-increasing network of bulldozed tracks in the hills, leading to a reduction in truly remote areas.

**Exploitation of natural energy flows:** principally wind and water.

**Afforestation:** an ever-increasing loss of open ground, with an associated reduction in open-ground species such as breeding waders.

**Climate change mitigation:** evidence-base lacking for much proposed action.

**Intensification of land management:** the push to maximise the economic return from land, or to manage intensively for specific nature conservation objectives.

**Adventure sports:** increasing popularity of high-adrenaline sports.

**Loss of grazing:** possibly a bigger issue than overgrazing.

**Introduction of global markets to farming:** leading to abandonment of marginal farming, or the amalgamation of holdings.

**Flood control:** the push to base flood control on vegetation type (often with little evidence base).

**Re-wilding:** attempts to recreate a woodland landscape in areas which would naturally be moorland, leading to a loss of biodiversity (loss of natural characteristics).

**Pressure for woodland networks & riparian planting:** which fragment moorland and reduce naturalness.

**Loss of wildness:** most of the above pressures result in more infrastructure in the country, reducing the truly wild areas which once characterised most of the Highlands.

**Invasive species:** Long-term vegetation change brought about the ever-increasing presence of non-native invasive species.

**Community empowerment:** changing pattern of land ownership and land management priorities.

**Political climate:** for example, the current antagonism to field sports in some quarters, the political push for more trees, or the push for less deer.

5. Are there any other topics or issues that should be included in an upland vision, and if so why?

There will have to be clarity as to which aspects of the uplands the visions will cover. Ideally it needs to be landscape-led to tackle the long-term recognition that there is continuing attrition of landscape quality. So the vision should focus on issues which affect how the landscape looks.

In addition to the issues listed in 4. above, the vision needs to indicate mechanisms which integrate the different, often contradictory national policies. For example, SNH’s Landscape Policy Framework\(^2\) – “the hills and moors noted for their openness” – and the Scottish Forestry Strategy\(^15\) which want 25% of Scotland under trees; or reconciliation of the government’s renewable energy policy with wild land policy; or biodiversity targets, such as upland waders, with further afforestation; or ‘rewilding’ with loss of naturalness.

There also needs to be a vision on the role of nature and landscape designations in safeguarding our upland landscapes. Even in 1983, a major conclusion of the Countryside Commission’s inquiry into

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\(^{15}\) The Scottish Forestry Strategy. Forestry Commission Scotland. 2006
the uplands was: “The ability of National Park and local authorities to tackle these problems and tap
the potential of upland areas is hindered by a lack of co-ordinated policies at the national level.”
It seems no different in Scotland today with the suite of landscape designations (Map 3) making no
apparent difference to the rate of landscape attrition – apart from the policy of no windfarms in
National Parks and National Scenic Areas.

The vision must also indicate how local people can influence decisions which are likely to reduce the
quality of their landscape. Currently national policy tends to override local concerns.

6. Are there any topics or issues that should be excluded from an upland vision, and if so why?

There are many rural issues such as rural schools, medical services, public transport, the fire service
and well-rewarded employment. However, if the vision becomes too much of a socio-economic one,
it will become too wide-ranging and focus will be lost.

Likewise there is a case for not including a vision for how upland land is owned uplands because this
is currently being covered by the government’s land reform programme.

HOW SHOULD THE VISION BE DEVELOPED?

7. Which stakeholders do you think it would be particularly important to involve, and how?

a. All interests whose activities shape the upland landscape (i.e. are responsible for infrastructure
   and land management).
b. All interests whose livelihoods depend on the character of the upland landscape.
c. All users of the upland landscape.
d. Government and its agencies who create or shape policy.

These interests need to come together to create a common vision, with no one interest group
allowed to dominate.

Would particular approaches be needed, for example, to reach particular groups?

Most people see the uplands in ‘the abstract’ without full awareness of the actual character of the
landscapes in question. For example, tourist interests or government officials might ‘see’ the
uplands as wild and unspoilt – while not noticing that wild areas are now few and far between. The
following approach is suggested in order to reach an agreed vision:

1. Objective presentations to all interests groups illustrating the
character of the different upland landscapes as they are today.

2. A listing of the pressures for change, and the landscape impact of
such changes.

3. Interests should be asked what they personally people value about
the landscapes of the uplands. A common set of values should then
be identified.
4. Which landscape/land use changes are compatible with these values, and which incompatible?

5. Agreement of those landscapes most sensitive to change, i.e. there is little wish to change them; and those where more change is acceptable, being in mind the values identified in 3.

6. Identification of policy changes need to ensure the vision can be achieved.

To prevent the vision been too complex and unmanageable, it needs to be focussed on issues which influence how the landscape looks.

8. **What are your views on the process that might be needed to bring together the key interests and develop a shared vision?**

See 7. above.

9. **Who would be best placed to lead this process?**

This process should be led by a non-political organisation with no land use, policy or political interests, most likely an academic institution such as the James Hutton Institute or a university or college.

10. **What form should a vision for the uplands take (visual or descriptive, maps, diagrams or text)?**

Abstract visions are of little practical use as it is easy to argue that a particular policy should not apply to a particular geographical location. A map-based vision is concrete, easy to understand and easy to relate policy to location. A common model is the concept of core and buffer zones as used in National Parks in most countries of the world. These zones need to be clearly delineated to avoid future argument and conflict.

11. **Do you have any other comments or suggestions?**

There has been so much development and land use change in the uplands in recent years it is probably the case that, to maintain what people value about the uplands, the rate of change will need to decrease. Acceptance of this might be hard to achieve politically: however we cannot have it both ways – either we maintain what people value about the uplands or we allow continual attrition of the upland landscape to the disbenefit of both the people who live and work in it today, and to future generations who will have to inherit the landscapes we create.