

Protected Areas for Nature – Review: Report to Scottish Natural Heritage Thoughts and Comments from Dr James Fenton

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Introduction

This is a personal response to SNH's 2014 commissioned review of Protected Areas. It is a subject which has always interested me and this response is based on my 30 years involvement in ecological survey, practical conservation management and development of policy throughout Scotland. Hence I hope it is of some use in taking the debate forward. This document is a download from <https://www.fenton.scot/landscape.htm>.

*Note that because both this document and the review document itself have numbered paragraphs, in the text below, paragraphs in the original document have bold text thus **para.15**, whereas internal references to paragraphs in this document are not in bold.*

A related paper, which covers some of the same ground, is *The Upland Ecology of Scotland: A Review of the Favourable Condition Approach in Relation to Grazing and Carbon Storage*, October 2014: available as a download from https://www.fenton.scot/landscape_ecology.htm

1. It is good to see this review because it is certainly timely to consider the effectiveness the current approach to protected areas in conserving Scotland's biodiversity. However to me the whole review seems a bit abstract, so in the observations below I have tried to make it more concrete.

The definition of biodiversity

2. One thing missing from the document, and a crucial thing at that, is what definition of 'biodiversity' is being used. Biodiversity can mean different things to different people:

a. Diversity at the global scale: At a global scale, biodiversity can be defined as the indigenous plants, animals and habitats found in the different parts of the planet, together with their natural arrangement: some areas of the globe are species-rich, some species-poor, and it is this variety that provides the total global biodiversity. From this perspective, the biodiversity of Scotland is fixed and cannot be increased (except through natural immigration of species) although it can be reduced, and also restored if humans have previously reduced it. Where the natural ecological characteristic of an area of Scotland is to be relatively species-poor, then this characteristic contributes to the variety of global diversity; in this instance, any human activity to make it more species-rich will, in fact, be reducing the biodiversity of Scotland.

b. Synonymous with 'high species diversity': However the above is often not the definition of biodiversity used in common parlance. Instead it is used as shorthand to mean 'high species diversity', with the aim of 'biodiversity conservation' being to increase the diversity of plants, animals and habitats in a given area. It can be seen that in some instances increasing the biodiversity at the local level (in the sense of increasing the diversity of species and habitats) can damage the biodiversity at the global level (in the sense of maintaining an area's natural relatively species/habitat-poor characteristics).

c. Synonymous with 'nature conservation': In a third meaning of the word, 'biodiversity' is often used as a substitute for the previously used term 'nature conservation', such as in the phrase 'biodiversity objectives' which is synonymous with 'nature conservation objectives'.

3. **Example of the use of definition ‘a.’:** At a nature conservation site, such as a relict raised bog, colonising *Buddleia* might be removed because it is not indigenous to Scotland, and so not a feature of the natural habitat type.

4. **Example of the use of definition ‘b.’:** A phrase often heard is along the lines “gardeners can benefit the biodiversity of Scotland by planting species beneficial to butterflies”. This reflects a mindset that maximising butterflies benefits biodiversity. However although a particular garden may in no way reflect a natural Scottish ecosystem, *Buddleia* may still be recommended for planting in order to attract butterflies: the garden is in effect being used for *ex situ* conservation of butterflies.

5. Both the planting and removal of *Buddleia* can be justified in the name of biodiversity: this is confusing to the layman. Hence in any new approach to conservation, there needs to be clarity at the outset on how the term ‘biodiversity’ is being used in a given situation.

Need to move away from ‘one size fits all’

6. This leads on to a major omission of the document: the concept that different approaches to nature conservation, including the use of protected areas, will be appropriate in different areas. Many of the issues raised relate to trying a ‘one size fits all’ approach.

7. Three broad approaches to nature conservation can be identified (taken from Annex 1 of the National Trust for Scotland’s *Principles of Nature Conservation*, 2001 – reproduced below as Appendix 1):

1. The Wilderness Approach: the conservation of natural ecosystems, but allowing for long-term successional dynamics, immigration, extinctions, etc. Not prescriptive.

This is particularly applicable to large landscapes of natural/near-natural vegetation, with the identification of any particular area as a ‘protected area’ area somewhat arbitrary – unless applied to a large area such the core area of a national park.

2. The Nature Reserve Approach: the identification of defined areas where there is management to ensure the nature conservation features are protected. Prescriptive.

This is particularly applicable to islands of relict natural/semi-natural habitat in a wider landscape of intensively managed land, for example a raised bog surrounded by arable farmland. It is an essential approach if we want to retain any semblance of naturalness in such landscapes; if these reserves are not managed prescriptively, then whole suites of species could be lost from wide areas.

However this approach is also applied to islands of protected areas in a wider, relatively natural landscape such as upland Scotland where The Wilderness Approach would be more appropriate.

3. Fitting-in: fitting native species into landscapes/sites where natural/semi-natural habitats have been lost, i.e. where most people live.

*Different criteria apply here, such as planting *Buddleia* in gardens, which would not be appropriate where Approaches 1. & 2. were being followed. It differs from the other two approaches because the aim is not necessarily to recreate authentic natural habitats. There is no need for defined protected areas as such. However the species being promoted should reflect the natural ecological characteristics of the area (those appropriate to the respective Natural Heritage Zone).*

8. Hence any new approach to protected areas (for nature conservation) needs to reflect the fact that different approaches are applicable in different areas. As mentioned above, there also needs to be clarity on what we are trying to achieve for 'biodiversity' in a given location (including what we mean by the term).

The need to retain defined areas of protected land

9. Any new approach to protected areas needs to reflect the need to maintain ring-fenced protected sites (Approach 2. above) in intensively managed landscapes. But I would fully support the statement in the document's **para.11**. "So nature conservation can only be effective if protected areas are complemented by other measures that add up to a wider strategy."

10. Where Approach 2. Is being followed, these other measures will generally include trying to link existing sites to create networks. But there has to be an element of pragmatism in this in that a purist approach of creating new 'natural habitats' through intensively managed land may not be possible: for example, soil eutrophication may make it impossible to recreate native grassland, or it may be impossible to recreate the kind of bog which centuries ago might have represented the natural habitat. In creating networks, although recreation of natural habitats may not be possible, the principle of only using species native to the locality should be retained (reflecting the natural ecological characteristics of the area). For example, creation of a species-rich grassland should exclude plant species not indigenous to Scotland [many wildflower mixes sold in Scotland contain species indigenous to the UK, but not to Scotland].

Where defined protected areas have less relevance

11. There are two totally opposing situations where the protected areas approach is less relevant, reflecting the areas where Approaches 1. & 3. are relevant:

12. In intensively managed landscapes of artificial habitats (intensive farmland and forestry, urban environments), the 'Fitting-In' approach will generally be the most relevant. Here there will be not attempts to recreate native habitats but instead an approach of trying to enable people to experience as many native species as possible – as many as we can fit into the landscape.

13. The opposite situation is where the landscape is largely composed of natural or near-natural habitats: if the whole landscape is largely natural, then selecting any particular area as a protected site can be somewhat arbitrary.

14. A relevant and important point is that much of the landscape of upland Scotland is comprised of vegetation types on Annex 1 of the Habitats Directive. The fact that these habitats are not in protected sites does not detract from their recognised international importance. Hence their common presence outside the current suite of protected areas does support the document's recommendations for new approaches. There is nothing stopping the Scottish government giving greater weight to the protection of Annex 1 habitats wherever they occur.

15. Identifying different approaches in different places along the lines discussed above would achieve what is stated on **page 4**. of the document: "Effective conservation requires a balance of effort on several axes: a network of protected areas that functions at the landscape scale; measures for the protection of highly mobile species; and policies ensuring that the rest of the environment is managed sympathetically. The more we know about ecosystems and their needs, the more this holds true. The ongoing loss of biodiversity signals that the amount and balance of effort need to be adjusted."

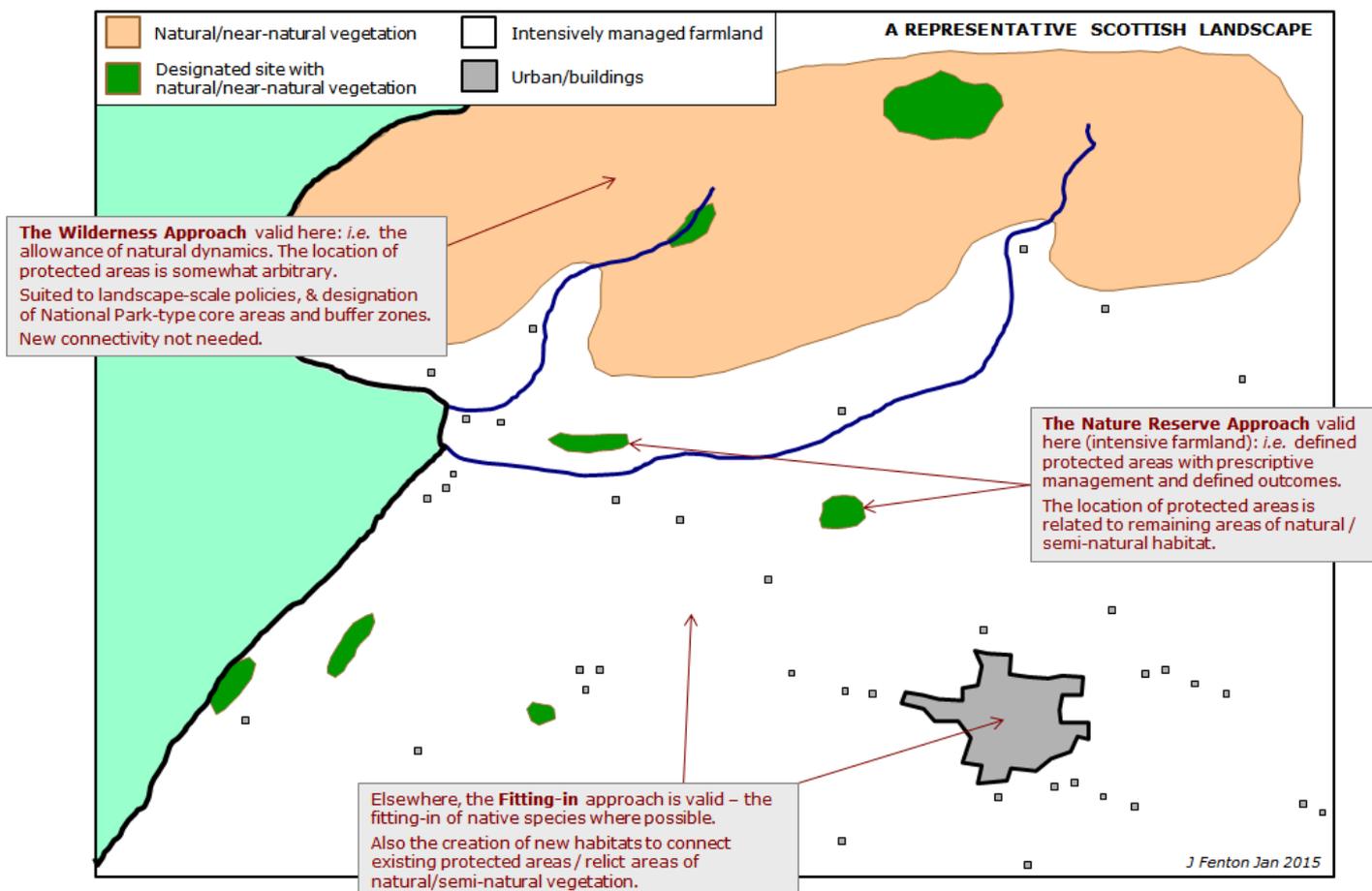


Fig.1. An example how the different approaches could apply to the landscapes of Scotland.

What is meant by 'loss of biodiversity'?

16. Aichi Target 5 of the Convention of Biological Diversity is:

“By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.”

17. I don't think people have really thought through what this means for Scotland. If it is assumed that all unimproved land of moorland, grassland, bog, scrub or woodland comprise natural or near-natural habitats, then bringing their loss “close to zero” means no further loss. On such unimproved land, every windfarm built, every windfarm access track, every forestry plantation created and the associated tracks, every new housing or other development, every area of rough ground scrubbed out by farmers ... will inevitably result in a loss of natural habitat – a loss of biodiversity.

18. There is some recognition of this in relation to agriculture under [The Environmental Impact Assessment \(Agriculture\) \(Scotland\) Regulations 2006](#), but even this allows for loss of unimproved land if impact is deemed insignificant. But it is cumulative loss of 'insignificant' impacts that in the long-term results in cumulative loss of natural habitats.

19. I think some realism needs to be brought into the possibility of halting biodiversity loss [*sensu* naturalness] in Scotland: I personally would like to see no further loss of any natural or near-natural

habitat. But politically this is probably impossible: every new windfarm track in the uplands, for example, reduces the extent of natural habitats.

20. If we want to halt the loss of biodiversity (as stated in the document's **para.17**), we must be clear what we mean by the term. If it means no further loss of natural or near-natural habitats, as in the Aichi Target, this is a high bar and difficult or impossible to achieve. If it means no further extinction of native species within Scotland as a whole, this is a low bar and probably achievable. And there is every combination in between ...

Need for scientific underpinning

21. The document appears to devalue the scientific approach to nature conservation, making it more 'people-centred'. However, nature conservation has to be underpinned by science: ecosystems are complex. Even an apparently simple concept such as that of a 'habitat' (*sensu* plant community) is an abstract concept which attempts to divide continua into [arbitrary] discrete units: a habitat comprises a grouping of plants identified by statistical analysis, with considerable variation in reality about the written description. An understanding of this should be (but rarely is) integral to conservation management. The application of ecological science is core to any development of a new protected areas system.

22. A comparison may be made with architecture: the final outcome, a building which people appreciate, is underpinned by a sound application of complex engineering principles (so the building does not fall down). Similarly, a landscape rich in natural features and indigenous species, which people can enjoy, needs to be underpinned by sound ecological science. Any protected areas system needs to be similarly underpinned.

23. Hence I am concerned to read **para.12**: "This in part reflects the history of protected areas, rooted in knowledge elites – mainly scientists – who focused discussion on what is valued in nature to a narrow range of interests, excluding most people (some early reserves carried an explicit 'keep-off' message). These narrow values are embedded in attitudes and approaches to conservation through the guidelines for the selection of biological SSSIs (1989 and 2013) which excludes social, economic and social-historical factors on grounds of objectivity."

24. Without "objectivity" the science of conservation is doomed, together with any ability to conserve the full range of the natural heritage of the planet. Ecology is not democratic, but complex. Every modern undertaking of humans, whether growing food or timber, building computers, running the internet, building aircraft or roads, house-building ... is underpinned by the expertise of "narrow specialists". Why should nature conservation be different?

25. There is a need for the 'highly skilled' professionals so lightly dismissed in **para.64**: to use the architecture parallel again, in the same way we would want highly skilled engineers to underpin the structure of a building, so we would surely want protected areas, and nature conservation generally, to be equally underpinned. As it is, I have a concern that there are not enough professionals 'highly skilled' in ecological science within SNH. This is not to mean, though, that nature conservation principles should not be better communicated to the public. Currently there are confusing messages (see the *Budleia* example in paras 3-5 above).

26. In practice the document appears to accept the need for narrow specialists, with **para.21** stating: "However, in under-representing non-vascular plants, invertebrates and soil fauna, it seems they [protected areas] are unlikely to form an adequate core for the protection of healthy functioning ecosystems." In relation to this, whereas the above species may not be mentioned in the notification of a protected area, it is possible that a good proportion of them are captured by the current suite.

Resilience to change

27. **Para.19** of the document states that the purpose of protected areas is “To maintain good examples of habitat types as core components of a wider pattern of healthy functioning landscapes that are resilient to change, and meet the needs of people now and in the future.”

28. This is good but contains an inherent contradiction. The document elsewhere discusses the need to allow dynamism in ecosystems: this means acceptance to change – which is opposite to ‘resilient to change’. You cannot have it both ways!

Past or future?

29. This is a key issue. Currently much conservation action in Scotland, particularly action by conservation NGOs, is trying to recreate imagined landscapes of several thousand years ago – and does not reflect the current ecological conditions or natural successional trends. By doing this, the naturalness (biodiversity) of much of Scotland is being damaged. Woodland ‘restoration’ is harking back to a long-ago past, with little current validity.

30. **Para.27** states: “Most of Scotland’s nature results from a range of environmental factors and modifications by people over many centuries.” This second half of this sentence is questionable when applied to the uplands.

31. However it goes on to say “Looking at historical factors and change over time can inform whether goals or expectations are valid or perhaps set on the basis of misconceptions (downplaying some drivers of change or characteristics of the habitat or skewed by current values).” I would fully support this statement.

32. **Para.28** states: “Taking this longer term view often reveals that the present is not always a good model for future planning of restoration or management. For example, heather dominance is an outcome of management, not a natural condition of the upland landscape. And pine dominance in East Glen Affric is not representative of woods that once grew in West Affric (where pine was a minor and relatively short-lived component of deciduous woods dominated by birch).”

33. I would fully agree that a long-term view is needed, particularly an understanding of the long-term dynamics of Scotland’s ecosystems. However there is no evidence to support the assertion that “heather dominance is an outcome of management”. It may be the case on acid soils in lowland England, but *Calluna* would be expected to be a naturally dominant species over much of upland Scotland at this stage of the post-glacial period; see Appendix 2 below. Scotland is at the centre of the world range of *Calluna*, but only peripheral for the likes of Scots pine.

34. The statement that “pine dominance in East Glen Affric is not representative of woods that once grew in West Affric” is certainly true (although there are currently significant stands of birch in East Affric). However it is not relevant as the evidence suggests natural decline of the West Affric woods – with widespread woodland decline over upland Scotland a natural feature at this stage of a postglacial period; see Appendix 2 below.

Dynamism in ecosystems

35. **Para.30** of the document states: “At least in more dynamic natural systems, the emphasis for site condition should be on natural processes and the conditions that underpin healthy functioning natural systems rather than the species and habitats present now. Further work is required to describe the condition of these systems so that their management requirements are clear and so that meaningful change can be monitored.”

36. Yes, we definitely need to accept the dynamism of natural systems. At present there does not seem to be acceptance of long-term ecosystem dynamics, whether within or without protected areas. For example there is currently a general intolerance of woodland loss, or of the impact of 'high' numbers of red deer.

37. Dynamism is encapsulated in The Wilderness Approach (para.7 above, and Appendix 1 below). In practice it means letting nature determine the balance of habitats and species, rather than us laying down what they should be. It also means acceptance that we might lose some of our cherished habitats and species – because our expectations do not correlate with ecological reality.

38. Hence in areas where The Wilderness Approach is appropriate, I would fully support the statement in **para.54** of the document, as long as we equally apply it to all habitats, including woodland: “**Natural processes:** “Focusing on assemblages of species and habitats over a wider area (site and beyond) rather than individual features of interest would reflect better how nature works.”

39. It would also mean, as discussed in **para.53** of the document, greater flexibility of the EU Habitats Directive: the directive’s approach, after all, reflects the thinking of the 1980s. Rigid application can fossilise thinking and result in a static view of the importance of different habitats. Note that there is a misinterpretation of this directive in **para.66** of the document: “Favourable Conservation Status” applies to the status of the habitat as a whole, not the state in a given protected area, where in the UK we use the term “Favourable Condition” for this. From an EU perspective, as long as the habitat is “favourable” across its range, then what is happening in a given site is less important.

40. Dynamism is also encapsulated in the ‘rewilding’ approach, of which it is surprising there is no mention in the document (although it would have been mentioned in the interviews). This is opposite of the prescriptive approach currently applied to protected areas, where outcomes are defined; ‘wilding’ and is about letting nature take its course – with no preconceptions about the future direction of ecological change.

41. Unfortunately many people equate rewilding with first adding trees to the landscape before allowing it to run wild – because, with little supporting evidence, they believe that upland Scotland is not in a natural state with respect to the vegetation pattern. This has some validity on intensively managed grouse moors, but even if management of these moors were to cease these areas would still be *Calluna*-dominated (see Appendix 2). Again, there is little evidence that there ‘should’ be a natural tree-line or more montane scrub.

42. In lowland areas of intensive land use, where the Nature Reserve Approach is more appropriate, then the prescriptive approach should still be used: if dynamism is allowed in a remaining island of semi-natural habitat (*i.e.* one habitat is allowed to swamp another one, such as bracken over heath, or gorse over dune slacks) this might result in the complete loss of species from the geographical area.

Better Connected

43. The concept of habitat connectivity as discussed in **para.33** needs to be looked at objectively. In lowland habitats, where current protected areas are islands in a sea of intensive land use, then there is a strong case for connecting these areas (as discussed in para.10 above).

44. However in upland Scotland, where protected areas are islands in a sea of natural or near-natural habitats, then there already is connectivity. Creating a new network can only be at the expense of an existing network: there is not a strong case for increased connectivity. This particularly applies to creating new woodland networks linking isolated areas of woodland which fragment the

existing moorland networks; an approach which will, for example, tend to result in a loss of the bird species with Arctic tundra affinities which currently characterise much of upland Scotland.

Ecological health

45. This is a term used throughout the document, but is rather vague and undefined. It is not particularly useful if dynamism is being accepted within a protected area – unless applied at a general landscape scale. For example, dynamism might allow woodland to colonise heathland, or heathland to take over woodland. If the term ‘health’ is applied to the declining ecosystem, we would have to accept that ‘poor health’ is a natural situation.

Gaining consensus

46. Certainly we want society to support the conservation of Scotland’s indigenous species and habitats and so maintain their contribution to our distinctively Scottish landscapes. However, as discussed above, ecology is a science – with ecological characteristics which cannot be determined by democratic choice. Hence it is not clear what “**Local decision-making**”, as discussed in **para.52**, would mean in practice – other than along the lines ‘Do we or do we not want this or that species/habitat, and how much do we want?’ And what about all the indistinct species listed in **para.21**, of which most people will have no knowledge or no interest? To be successful, conservation has to be science-based – and most people are not scientists.

Conclusion

47. Certainly a new approach is needed, with more wildlife brought back to the wider countryside. To achieve this, I would suggest it would be helpful to recognise the different approaches available, along the lines given in Fig. 1 above and Appendix 1 below. Thereafter we would need to adjust the policy framework to take account of the fact that different approaches to protected areas, and to nature conservation generally, are appropriate in different geographical areas.

WHAT IS NATURE CONSERVATION?

James Fenton, NTS Nature Conservation Adviser, 28/11/2000

Nature Conservation & Biodiversity

Nature conservation can be defined as "the conservation of the full range of species and ecosystems indigenous to an area" – in modern parlance: "the Conservation of Biodiversity". However, "biodiversity" should not be confused with "diversity" *per se*, as some ecosystems are naturally species-poor: biodiversity does not necessarily mean having as much as possible of everything everywhere!

A sense of place

Species introduced to an area (accidentally or otherwise), may result in a short-term increase in diversity, but viewed globally, introduced species are one of the biggest threats to biodiversity, in that they can often outcompete and kill off the indigenous flora and fauna. Nature conservation is ultimately about the conservation of our global diversity, which in practice means the conservation of the natural ecological distinctiveness, the indigenous plants and animals, of each part of the planet.

Approaches to nature conservation

Different approaches to nature conservation are valid in different localities, and in conservation planning the relevant approach should be identified at the start. Three possible approaches are given below:

1. The Wilderness Approach – Wild Nature: the Ideal?

The concept:

- * No or little human intervention, no defined outcomes
- * Letting nature 'do its own thing', manage itself
- * Acceptance of natural dynamics (immigrations/extinctions)
- * Letting plants and animals characteristic of each part of the planet follow their natural progressions

Applicable to:

- Large areas of land (but not necessarily so, *eg.* offshore islands, sea stacks, ponds, gutters)
- Land where few economic or social constraints

2. The Nature Reserve Approach – Wildlife Gardening

The concept:

- * Intervention for target species & ecosystems, defined outcomes
- * Managing nature
- * Varies from minimal intervention to full-scale habitat & species manipulation
- * Intolerance of ecological succession

Applicable to:

- Areas where nature or cultural landscape conservation is the primary objective
- Islands of semi-natural habitat in an intensively managed landscape
- Conservation of species now rare through man's activities

3. Fitting In

The concept:

- * Fitting as much wildlife (indigenous species) as possible around economic activities, *eg.* farming, forestry
- * Examples: conservation headlands, farm ponds, 10% native trees in commercial forests, wildflower verges

Applicable to: – Any area of land where nature conservation is secondary to other land uses

APPENDIX 2: Comment on paragraph 28 of the Protected Area Review

“Para.28. Taking this longer term view often reveals that the present is not always a good model for future planning of restoration or management. For example, heather dominance is an outcome of management, not a natural condition of the upland landscape. And pine dominance in East Glen Affric is not representative of woods that once grew in West Affric (where pine was a minor and relatively short-lived component of deciduous woods dominated by birch).”

Heather dominance

There is no evidence that heather (*Calluna*) is the “outcome of management”. Fig. 2, a pollen diagram from Caithness, shows that, in this location at least, heather has been common in the landscape on and off for 8,000 years. Note also that because heather is insect-pollinated its pollen does not disperse as readily as wind-pollinated trees, grasses and sedges – hence it is likely to be under-represented in pollen diagrams.

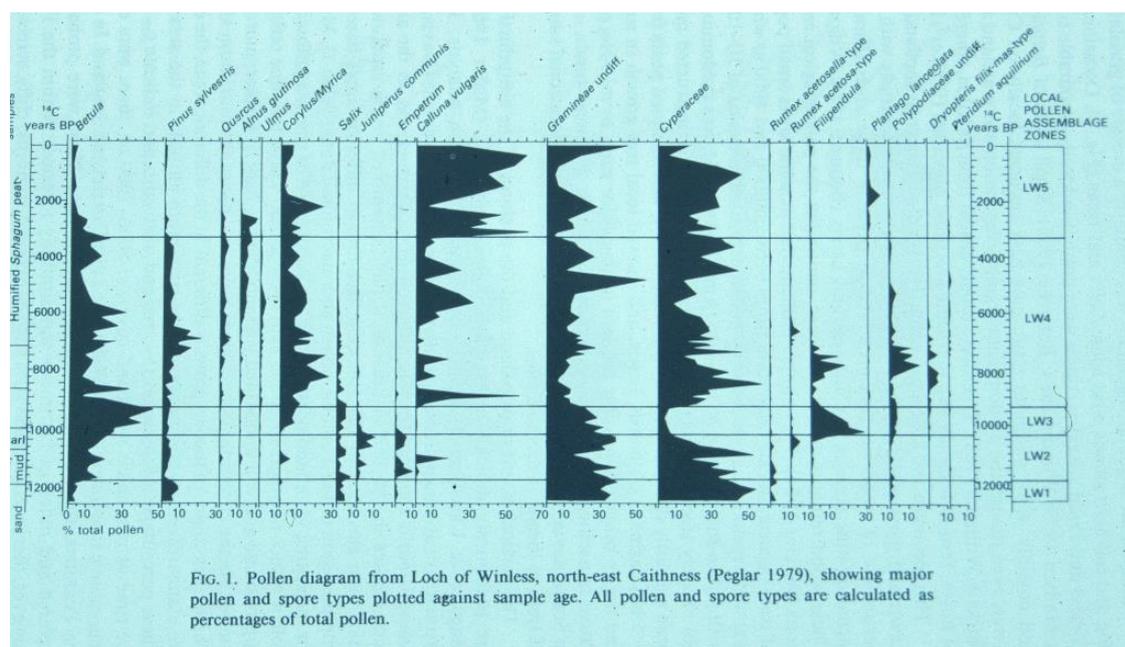


Fig. 2. A pollen diagram from Caithness from: Peglar, S. (1979) A radiocarbon-dated pollen diagram from Loch of Winless, Caithness, northeast Scotland. *New Phytologist*, **82**, 245–63.

Note also the following in relation to heather in the Cairngorms area, from: Paterson D, 2011. *The Holocene history of Pinus sylvestris woodland in the Mar Lodge Estate, Cairngorms, Eastern Scotland*. PhD thesis, University of Stirling [emphasis added].

“Arrival of *Pinus* at Geldie Lodge [Mar Lodge Estate] is undated but occurs before c. 7550 cal BP. Woodland is always more open; *Pinus* is co-dominant with *Betula*, showing affinity with other peripheral areas. *Pinus* woodland fragments at all Mar Lodge sites from c. 3900 cal BP, disappearing from Geldie Lodge by c. 2800 cal BP and White Bridge by c. 1900 cal BP. ***Calluna* replaces *Pinus* as the dominant species at all three sites.** The disappearance of *Pinus* is thought to relate to regional climatic change toward wetter conditions.”

Glen Affric

The following is quoted in Paterson’s above thesis:

“In west Glen Affric, *Pinus* began to decline at c. 4000 cal BP with woodland continuing to fragment until c. 2000 cal BP (Davies 2003a and b, Shaw 2006), by which time the valley consisted of the ‘apparently monotonous treeless landscape’ seen today (Davies 2003b, page 75).”

In addition to the long-term natural decline of woodland in West Affric, research also shows that in east Glen Affric the native pinewood has been shown to cycle wood-heath-wood (Paterson 2011): *i.e.* *Calluna* heathland is a natural element.