Re-wilding the conservation agenda in the UK

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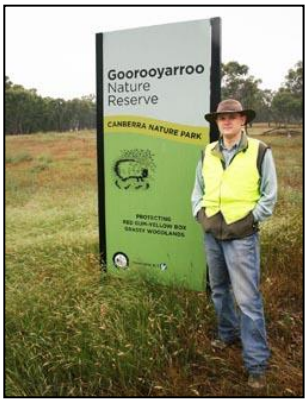

The creation of wildland, through the process of re-wilding, has great potential to address (at least) two key challenges for conservation in the UK: (1) ongoing biodiversity loss; (2) facilitating climate change adaptation. Consequently, there is a strong argument for re-wilding and wildland to become mainstream in conservation research, policy and action in the UK. In this perspective piece, I will argue that there is a need for a re-think of our conservation approaches, and will discuss in particular the ecological arguments for re-wilding, and the key factors that are needed for it to become a major complementary component of conservation strategies.

Why do we need to rethink our approaches to conservation in the UK?

I see five key issues:

(1) ***Shifting baselines syndrome***. The environment experienced by people when they are young provides the baseline for their expectations regarding quality and ecological functions of natural areas (Miller 2005). In a continually degrading environment, there is a ‘‘ratcheting down’’ of the expectations of each generation as the baseline is lowered (Miller 2005). For example, today many children are only familiar with the introduced grey squirrel in their local woodlands. Yet their parents might remember red squirrels and so forth. Looking further back, some species we now associate only with the Scottish Highlands were once ubiquitous in the landscapes of the UK. For example, the pine marten (until at least 1800) and wildcats (before 1800) (Yalden 1999). Even Capercaillie lived in County Durham in the 11th Century (Rackham 1979). We must be very wary of framing our conservation goals based on current or recent environmental baselines as they are a result of the very degrading processes that caused the loss of biodiversity (see below).

(2) ***Current approaches are not working***. Despite many local successes, on the broad scale many native species continue to decline, and their habitats continue to be degraded or lost. Also, we now are at a very low environmental baseline after millennia of ecosystem modification and loss. In Australia this is often euphemistically termed “over-clearing”, but applies equally to the UK. For example, the grubbing out of ancient woodlands and hedgerows or the draining of wetlands. We have gone too far for much of our native biodiversity.

The UK has developed many valuable cultural landscapes which have distinct suites of native species. However, agricultural intensification and changing economics have had a profound effect on these areas. To maintain the range of habitats and species we have left, often requires intensive, costly micro-management. It is not clear that applying current conservation approaches more resolutely will arrest the general trend of species and habitat loss and modification, or facilitate climate change adaptation.

(3) ***Changing concepts of landscapes and conservation.*** Traditionally, conservation has been pursued through spatially static, reserves embedded in landscapes generally used for commodity production (e.g. agriculture and forestry). However, most land is off-reserve and all species cannot be conserved in reserves. At the same time, landscapes have often been conceptualised from a human perspective as either habitat or non-habitat, with connectivity being provided by corridors. However, more recently it has been recognised that different organisms perceive and respond to the same landscape differently (Manning et al. 2004). The implication of this is that there are as many landscapes as there are organisms to perceive them – this is a challenge for land managers; especially because of climate change.

(4) ***Climate change***. In response to climate change, ecological communities are expected to disassemble, and organisms will respond individualistically with differing rates of movement (Peters 1990; Erasmus et al. 2002; Thuiller 2004). In addition, ecological processes and interactions between species and with the environment will change (Breshears et al. 2005). The implication of this is that landscapes and ecosystems in the UK will be in ‘disequilibrium’ as organisms try to respond to climate change. Effectively, the traditional concept of ‘the balance of nature’ in the British countryside is no longer tenable. Modern landscapes are much more fragmented than those in which many species evolved. The combination of climate change and the reduction in natural connectivity are a major barrier to adaptation by many species. Conservation-through-reserves alone is not enough to arrest or reverse species loss or adapt to climate change. There is some doubt that all organisms will use corridors for movement (Donald and Evans 2007). This, and the recognition of the importance of different species’ perceptions and responses to the same landscape, requires a shift in emphasis from corridors towards ‘whole landscape’ connectivity; irrespective of land use or ownership (Manning et al. 2009a).

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Climate change will also result in the emergence of ‘novel ecosystems’ that contain combinations of species that have not previously been observed, including exotic species (Hobbs et al. 2006). For conservation, this raises the challenge of whether to try and resist these changes, often at high expense, or let an ecosystem evolve in a new direction.

(5) ***Resources for conservation are limited***. The magnitude of the challenges facing UK conservation means that funds are unlikely ever to be sufficient to support current approaches to the extent needed. Conservation needs to be effective over a larger area without a significant increase in resources.

The combination of these issues requires reflection on the effectiveness of our current approaches to conservation. What is working? What isn't? What is sustainable? What isn't? Are there additional approaches that could be adopted? Wildland and re-wilding have the potential to complement current approaches and help overcome these issues.

What are wildland and re-wilding?

Wildland is a description of an area containing an essentially 'natural' ecosystem. Some general properties of natural ecosystems are:

- self-organisation (i.e. things live, grow and move where and when they want);
- self-renewal;
- that natural processes, disturbances and interactions predominate;
- they generally cover large areas (i.e. landscapes);
- they are often structurally and compositionally heterogenous at a range of scales with gradual boundaries transitions;
- a high degree of connectivity for many organisms and processes;
- they generally have fully functioning food webs including key trophic levels;
- they have 'adaptive capacity';
- they tend towards 'resilience'

Re-wilding is the process of returning some or all of these properties to an area. In some ways, re-wilding is a better term than 'ecological restoration', because it circumvents unproductive arguments about "restore what?" (which are sometimes used to stall moves to try alternative landscape management approaches). In reality it is not possible to restore a facsimile of any point in the past. It is however possible to restore the *properties* of 'wild' ecosystems.

How could re-wilding help overcome these five conservation issues?

The adaptive and self-organising properties of wildland means that they should be able to respond more easily to drivers of change. The whole-of-landscape approach, including high connectivity, better reflects the needs of individual species. Wildland and re-wilding focuses on the harnessing of natural ecological processes over large areas – such ecosystems should require much less resources to manage them over time. The wilder properties of re-wilded landscapes, including the reintroduction of lost species will help raise the low baseline of expectation that we currently have. The process of re-wilding also provides a unique opportunity to research the process of ecosystem recovery.

Re-wilding in practice

While re-wilding has great potential for addressing the biodiversity crisis in the UK, it requires some changes in how we think about conservation and our goals. Ceding human control means allowing an ecosystem to head off in directions that may not currently be considered desirable. For example, allowing wildfires to burn, allowing scrub to grow in open habitats, allow animal populations to boom and bust. Wild ecosystems are often considered 'messy' – which in ecological terms is 'heterogeneity' – a key ecosystem property (see below). Managers would no longer aim for a particular habitat type or numbers of a particular species, but rather the target would be the overall vision or goal. For example, a goal might be to guide an ecosystem towards self-organisation and self-perpetuation, so that minimal inputs are needed.

In the initial stages, re-wilding may be resource intensive during the period when the key ingredients of an ecosystem are established (e.g. reintroduction of keystone species, addition of deadwood, remediation of threatening or degrading processes), but in the long-term it should be possible to withdraw active management. Re-wilding will undoubtedly need more land than is currently allocated to conservation because it is by definition more extensive in order to allow natural processes to operate and organisms to respond adaptively.

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Does re-wilding mean the end of current approaches?

Re-wilding should be seen as complementary to current approaches, however, I think the centre of gravity needs to shift in the direction of wildness for the reasons outlined above. There will always be a need for species- or habitat-specific actions, but if re-wilding works, as I think it could, the need for the former would reduce if the latter was successful.

Is re-wilding a threat to traditional landscapes?

UK landscapes have always changed, even though that change may have been slow (though not always). From a biodiversity perspective, a large degree of damage was done between 1940 and 1985 through agricultural intensification in the drive for food production (Marren 2002). Rapid climate change promises to become another major driver of landscape change. Change is inevitable, but we do have choices about how we adapt to that change. Re-wilding is a way to allow natural adaptation and restore some of the wildness that has been lost from landscapes over the millennia. Re-wilding and traditional landscapes are not mutually exclusive and could co-exist as part of an integrated approach to adaptation of human and ecological communities. In 500 years time, re-wilded landscapes would also be considered traditional.

Wilderness, wilderness everywhere?

There is a common misconception about re-wilding; that it means all options, no matter how wild, could happen anywhere. This is not the case. Re-wilding should be seen as a continuum of options appropriate to the location (though the most ambitious end of this continuum should be wild). At one end of the continuum, re-wilding would mean the return of what we might term, 'wilderness' to some landscapes, however in others, re-wilding would return 'wildness' i.e. some of the properties of wild ecosystems. For example, when pine martens and

wildcats were still widespread, the landscapes they occupied were not wilderness, but they did possess a wildness that has since been lost.

So, in many UK landscapes, I see that re-wilding would return wildness as distinct from wilderness. This would result in integrated landscapes that have the properties of the wild ecosystems within which organisms evolved, without needing to be facsimiles, and that integrate conservation and production. For example, colleagues and I recently argued that scattered trees could be used in production landscapes to complement ecological networks and reserves and to facilitate climate change adaptations (Manning et al. 2009b). This would create gradual boundary transitions, allow the co-existence of woodland and open country organisms on the same land and permit multi-directional movements in response to climate change.

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Similarly, the UK may want to explore the possibilities for creating 'hybrid' ecosystems that fulfil the needs (habitat and connectivity) for organisms currently supported by separate 'habitats'. This will require increasing the scale of management to the landscape, and developing production systems that also integrate the properties of more natural systems. For example, in Australia it has been shown that rotational grazing can benefit biodiversity and allow scattered native trees to regenerate naturally in fields without affecting production output (Fischer et al. 2009). Could similar integrated systems be developed extensively in the UK (e.g. new wood-pasture)?

How can re-wilding become mainstream?

The following are some ideas about some key factors that I think are required for wildland and re-wilding to become a mainstream part of conservation research, policy and action in the UK.

Re-wilding must become evidence-based. If re-wilding is to be adopted by policymakers and land managers, it is essential that it can prove that it is more effective than current approaches, and can address the five key issues outlined above. Consequently, I believe that it is imperative that it become evidence-based. Critical to building an evidence-based approach is the ability to show the relationship between cause (re-wilding actions) and effect (ecological outcomes). This requires not only monitoring of ecosystems changes, but designed, long-term 'natural' experiments. This will require the integration of re-wilding projects with research programmes – and the associated increase in the number of researchers in re-wilding at UK universities and research agencies. In particular, I think it is particularly important in these early years that pioneering re-wilding projects are able to provide evidence to encourage further support within the community, government and non-government sector.

Understanding the myths about, and barriers to, re-wilding. There are many myths about, and barriers to, the wider adoption of re-wilding. Building the evidence on the ecological benefits of re-wilding in the UK context will go a long way to address this. However, there are also cultural barriers, both within society and the conservation sector, to a transition towards re-wilding approaches. For example, natural systems may be considered 'messy' by some (see above), regenerating scrub may be seen as a threat to a particular habitat type and withdrawal of intervention may be seen as 'poor' land management. It is important that re-wilding research also helps understand the reasons for these perceptions and ways to overcome them.

Developing new measures of success. Re-wilding does not have the same measures of success as conventional approaches have i.e. number of species, area of habitat etc. This is because natural ecosystems and the populations of species that form them, fluctuate and change naturally. New measures of success need to be developed that can be used to demonstrate the value of the approach, and ensure that it is working effectively.

Support for re-wilding. To make the transition into the mainstream, re-wilding needs support in the form of resources, directed through policy, research funding, and grants and incentives. Underpinned by emerging evidence, policies need to be developed that reconcile both species/habitat/site-based approaches and ecosystem/landscape/re-wilding approaches.

Rebuilding the baselines. Ambitious demonstration projects are essential to (1) understand the ecology of re-wilding in the UK context (2) show what is possible within the UK; (3) raise the baseline of conservation expectations. Some excellent examples already exist. I believe that there is a need for a step-change in Government incentives and encouragement for this type of project.

Some might ask the question: won't wild places somewhere else do for our benchmarks? Wild places and re-wilding projects overseas provide very important inspiration and examples of what could be possible. However, they often don't seem to translate into the action required to establish similar projects in the UK. Ultimately, I think this is because it is always possible to say "but things are different over there". A good example is beaver reintroduction. Beaver populations have been recovered or reintroduced to most European countries over the last century (Halley and Rosell 2002). However, despite these conservation benchmarks it took until 2009 for a reintroduction to happen in Scotland – after what many would consider has been a needlessly drawn-out process. Interestingly, inspired by the Scottish project, England has now conducted a feasibility study into beaver reintroduction – illustrating the power of UK benchmarks to influence conservation thinking.

I believe that we need at least one place in the UK that is re-wilded and includes all the key species and ecological processes that would have been present had humans not removed or modified them. This should include large predators. We need to start seeing these key species for the processes that they bring back, and the positive effects they have on ecosystems, not as an ends in themselves. This could occur under controlled conditions (as we have proposed recently; Manning et al. 2009c). This would not only serve to raise the shifting baseline to the highest level possible (by which all other projects could position themselves). It would also provide a unique research opportunity to learn from a large-scale ecosystem recovery and inform any future decision on a wider reintroductions. At the same time, there should also

be a range of demonstration re-wilding projects in every region or county – leading ultimately to re-wilding as part of every landscape in the UK.

Stretch-goals and back-casting

To achieve ambitious re-wilding goals that are far beyond what is currently thought possible, stretch goals can be very useful. Stretch goals are highly ambitious goals that are identified to inspire creativity and innovation to achieve things that currently seem impossible (Manning et al. 2006). Once an ambitious stretch goal has been decided, it is then possible to use backcasting to work out the milestones needed to achieve the goal. This approach overcomes problems of setting goals based on low baselines and on past trends.

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Managing the transition

Species/habitat and site-based approaches have developed for good reasons. These approaches will always be important, but I think there is a need for a shift in the centre of gravity towards re-wilding and wildland. In a country that has a tradition of intensively managed landscapes, this alternative challenges the norm. This means a move from specific habitats that may support specific species, towards heterogenous landscapes that support a species somewhere at any given point in time. Such a transition will need to be managed carefully over the long-term and would be contingent on evidence indicating improved biodiversity conservation and adaptation outcomes resulting from re-wilding.

Conclusion

Re-wilding, and the creation of wildland, should not be seen as a rival to current approaches, but rather as complementary, in achieving the ultimate goal – adaptive landscapes in which biodiversity thrives. Re-wilding principles are already being applied in many places with success. However, I believe this must happen much more. It is imperative that ecological evidence is gathered to prove that re-wilding works, and that we understand how to make the transition from where we are now. The new Wildland Research Institute at Leeds University is a highly significant development in this process, and promises to provide vital research leadership in this critically important emerging field of conservation. In the future, I believe that all landscapes should contain some wildland as part of a nationwide strategy which supports adaptive human and ecological communities. The new Wildland Research Institute has a major role to play in helping make this a reality.

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This perspective article draws on the work of Dr Manning. References have been minimised due to lack of space, but for more information and reprints of relevant papers please contact Dr Manning at adrian.manning@anu.edu.au.