

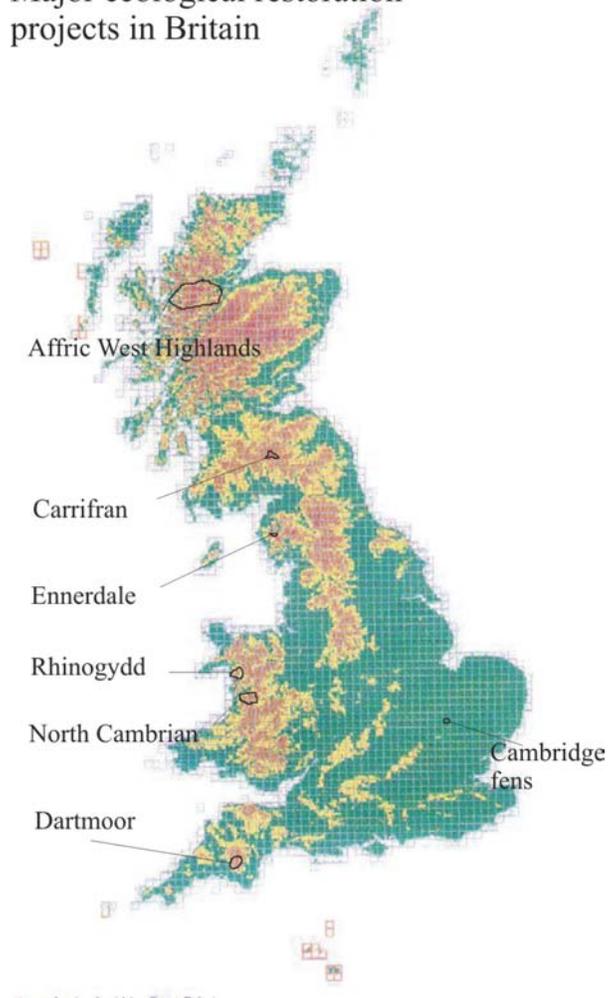
Large scale ecosystem restoration initiatives in the British landscape and the potential reintroduction of large carnivores.

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Abstract

There are a number of landscape scale conservation initiatives in Britain that involve the creation of core areas of wild land and the restoration of indigenous vegetation. The largest schemes involve cooperation between various non-governmental organisations, as well as some government funding, in targeted land purchases. In addition to these core area schemes, government agencies are grappling with problems facing uneconomic livestock husbandry in the uplands. We outline recent conservation thinking on linking core areas with mosaics of wildlife-friendly corridors (Forest Habitat Networks), the return of the native herbivore guild, and the potential for re-introducing large carnivores.

Major ecological restoration projects in Britain



Re-wilding initiatives and the return of large carnivores

There are several large-area *wildland* initiatives in Britain ranging from pilot schemes of 1000 ha, to habitat networks involving areas of 100-2000 km². Whilst the ethos of these schemes relates to a general *re-wilding* ethic involving space, tranquillity, natural processes and restored vegetation in the form of regenerated ancient forest ¹, many of the ecologists involved appreciate that a functional forest consists of a native herbivore guild and the large carnivores it would support. ^{2,3,4,5}

Britain's large carnivores were exterminated by hunting and forest clearance: the bear and lynx in Roman times, and the wolf in the 17th Century. In the last decade conservationists have begun seriously to consider the potential for re-introductions. It is widely accepted that wolf and lynx could be introduced without significant ecological barriers in Scotland, where there is suitable habitat and prey, whereas we require further understanding of the habitat requirements of bear. There are areas in England and Wales that could potentially support lynx. The main barrier to the return of large carnivores is the perceived economic risks to established land uses in sheep farming, deer stalking and grouse shooting, as well as public phobia about dangerous 'beasts'.

Initial thinking has involved relatively broad assessments related to available habitat and prey. Yalden, for example, suggested limiting the first re-introductions to the island of Rhum, a National Nature Reserve with no agricultural use and few inhabitants. However, recent thinking has been part of a more general move to restore degraded upland environments to more natural conditions and to establish a greater degree of forest cover. It is now government policy in England (with 8% woodland) to double the area of forest and for the greater part of new planting to be 'native' species in a multi-functional forestry that enhances biodiversity and public amenity. In Wales, forest cover is greater with 30% in Snowdonia (almost entirely plantations of short-rotation pulp-wood, it is government policy to double the proportion of semi-natural woodland). Even in relatively well-forested Scotland, the proportion of native-species is low, and there are wide-ranging initiatives to regenerate the ancient forests of Caledonian pine (*Pinus sylvestris*).

Large scale Forest Habitat Networks

These reforestation initiatives present opportunities for the re-creation of larger scale *forest habitat networks* – a concept developed in order to integrate new woodland with other conservation objectives, such as the preservation of secondary associations of *Calluna* heath, upland grassland, and blanket bog, as well as maintaining the upland farming communities upon which the secondary habitats are dependent for grazing herbivores.

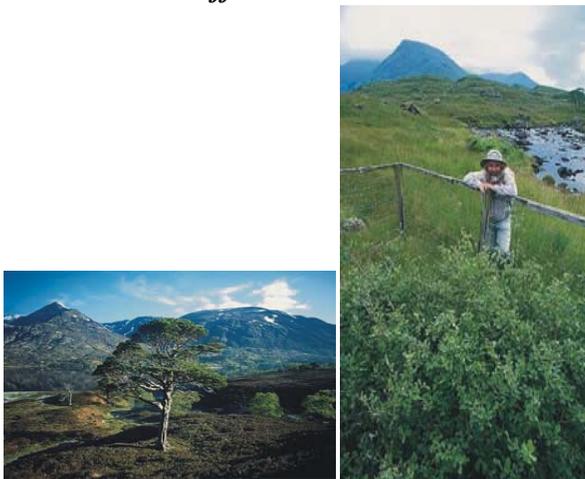
In addition to these larger scale government-agency initiatives, there are several important and pioneering voluntary-sector projects aimed at the complete restoration of ecosystems to truly *wildland*. One of the main problems with reforestation programmes is that they are largely focussed upon trees – whether for timber or amenity, and any large scale land-use changes must also serve social and economic criteria relating to maintenance of rural life. *Wildland* projects relating to the 'wilderness' ethic of limited human intervention, natural processes and small scale

eco-tourism are more problematic, and although a major government review of the UK's National Park's policies⁶ recommended 'core areas' of truly wild land, no government commitment ensued. Only the National Trust has taken the initiative in the purchase of contiguous areas and cooperative work with government forestry agencies⁷.

The 'core area' initiatives

In the mid 1990s several conservationists determined to further the concept of core areas. Alan Featherstone in Scotland, Peter Cedrowen Taylor in Wales and Adam Griffin in England had each developed core area proposals, and this small group began the long process of education and lobbying for change.

Scotland: Glen Affric



Alan Featherstone's award-winning group, Trees for Life, has been the most successful, having drawn support from government forestry agencies and a major landowner – The National Trust for Scotland, and now working to restore native Caledonian Forest in a large area centred upon Glen Affric⁷. If this work is successfully expanded with corridors across to the west coast where there are several large National Nature Reserves, an area of almost 2000 km² can be transformed into a mosaic of pine forest, montane scrub and grassland. At present the area contains red deer *Cervus elaphus* and roe deer *Capreolus capreolus* at population densities that severely limit natural regeneration of the forest. The main work has involved fencing to encourage natural regrowth and planting of native seedlings in areas distant from seed trees.

It has always been part of the *Trees for Life* vision that the full spectrum of animals be restored to a 'living forest'. This includes the return of extinguished large herbivores and the predator guild. Thus, moose *Alces alces* (extinct ca 3000 BP), tarpan *Equus ferus* (ca 6000 BP), and aurochs (3000 BP) – the latter two making use of primitive Exmoor ponies and either reconstituted Heck cattle, White Park cattle or the Highland breed of hardy horned animals), could all be considered, as well as wild boar *Sus scrofa* of which there are two recently established feral groups of escaped wild-type farmed stock now colonising southern England. One enhancement that is sought in the short-term is the return of beaver *Castor fiber* and with this in mind, in 1992 a small group of committed conservationists began a campaign for re-introduction of

the beaver as a keystone species, by visiting re-introduction sites in Brittany. After 10 years, government has agreed a programme for Scotland, expected to begin releases in 2002, though now postponed due to opposition from neighbouring landowners.

The area could readily support wolf and lynx given the super-abundance of deer (there are about 300,000 red deer in Scotland) and lack paucity of farming in the region. However, the vegetation has suffered almost two millennia of degradation, and further research would be needed with regard to the suitability of the region to support bears.

Outside of Glen Affric, Scotland has a number of rewilding projects, with all the major conservation bodies engaged, often in cooperative ventures, to restore natural forest lands – the RSPB and National Trust for Scotland are active in the Cairngorm Mountains, the Woodland Trust around Loch Lomond, and a private *wildland* project at Carrifran in the southern uplands in an area almost devoid of trees but close to the great network of forests on the Scottish borders ⁸.

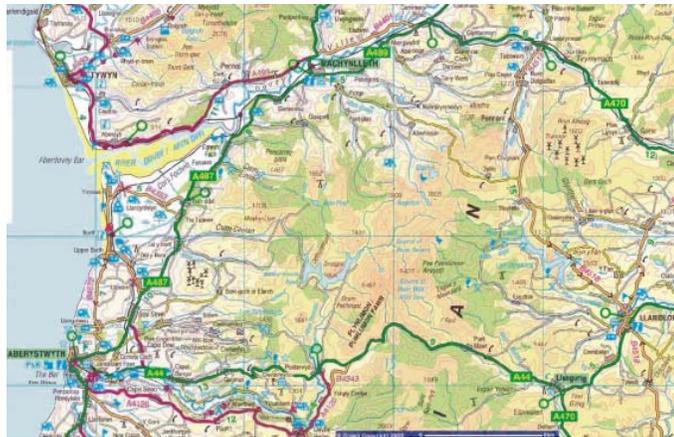
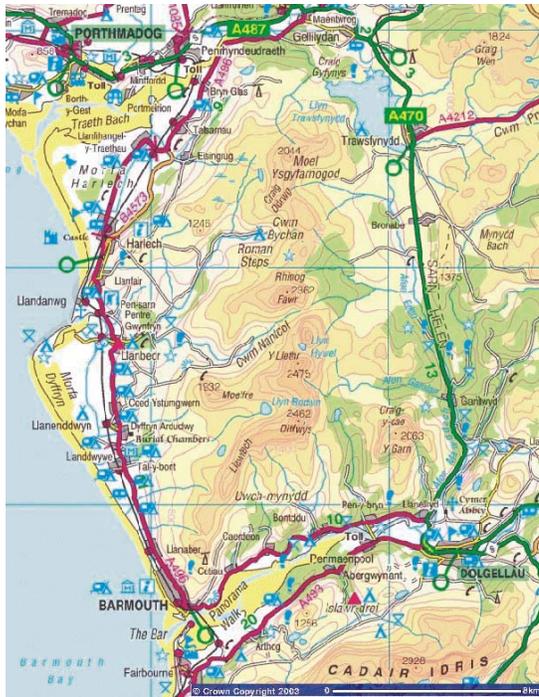


Wales: Coed Eryri and the Cambrian Mountains

A Welsh group was formed in 1990 to further the idea of large area restoration and *wildland* in Snowdonia (Eryri) ⁹. In contrast to Scotland, the potential core areas in Welsh National Parks are all heavily grazed by domestic stock and rural life is dominated by the infrastructure that supports hill livestock farming. Attempts by government to control grazing and encourage natural regeneration of native Atlantic oakwoods have been of limited success, barely securing the status quo, with only 1% of the National Park having anything approaching natural vegetation status – valley woods are over-grazed, there are large areas of grazed upland heath and grassland that would naturally be oak-birch forest or montane willow-juniper scrub.

Snowdonia is also heavily used for recreation, sport, drinking water and hydro-electric supplies, with concomitant tourist infra-structure, as well as containing long-established Welsh-speaking communities in small towns developed during a major industrial past connected to slate mining.

This makes an unpromising ground for core areas – but one candidate area of the order of 200 km² does exist within the 2130 km² of the National Park. The geological area of the Harlech Dome – the *Rhinogydd* has a core of extremely rocky ground, remnant oakwoods, remote upland heath and grassland, with no through roads. To the east it is connected to other remote areas of the Park, though bisected by a major road, and on all other sides by estuaries to the north and south and coastal areas to the west.



Parts of the proposed core area are owned by the National Trust and government forestry bodies as well as private forest companies – there is a patchwork of land-uses involving plantation of conifers, sheep and cattle grazing. There are no native large herbivores, though one forest block contains fallow deer *Dama dama* and there is a small population of ancient feral goats that are of some conservation value.

Proposals for a *wildland* initiative in this area, which is surrounded by sheep farms and small tourist towns, are necessarily complex and of a different kind to Glen Affric. They involve the slow process of education, government policies aimed at restoring biodiversity to farmland, restructuring of former single-purpose forestry plantations, strategic purchase of land for minimum intervention management, and eventually, proposals to limit vehicular access and military overflights.

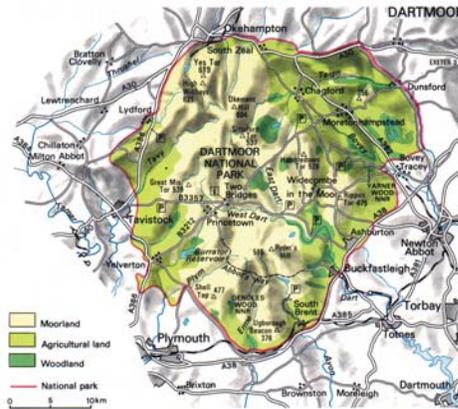
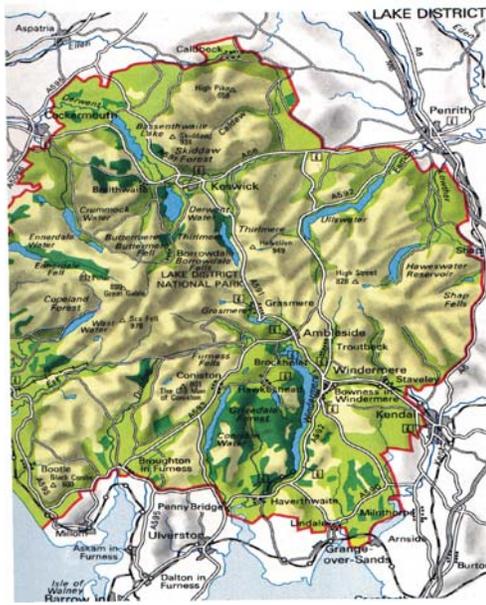
Once sufficient of the core area is under minimum-intervention management and restoration of native forest cover, consideration can be given to restoring the native herbivore guild – wild cattle, tarpan, red and roe deer, boar and beaver. On ecological criteria, the area is probably too small to support wolf and bear without a major change of land use in contiguous areas of the Park, but we believe lynx could be supported once deer numbers were restored.



Ultimately, any core area will require connectivity to other wild areas for its viability – and major problems are presented by transport infrastructure and upland land use. In this respect, with fewer large urban areas of motorways, Wales is better served than England. We can envisage wildlife-friendly corridors devoted primarily to forestry (in a mosaic of habitats) that would link the *Rhinogydd* to the main Cambrian Mountain chain, an area of species-poor upland grassland and conifer plantation with small remnants of Atlantic oakwood. The government's Land Use Policy Group is working on issues corridors and forest habitat networks ('New Wildwoods'¹⁰), with some potential for success in the northern part of the Cambrian mountains.

England: Lake District fells, Cambridge fens and Dartmoor

There are a few potential *wildland* areas in England despite the very high urban populations close to all the National Parks¹¹. The wildest areas are in the North Pennines, Lake District and borders region of Northumberland. However, the North Pennines consist of sparsely wooded upland zones of acid grassland and blanket bog (with high nature conservation value ascribed to the secondary habitats), the Lake District is heavily used by the tourist industry and for upland sheep production, and the Northumberland borders region contains some of the most extensive planted conifer forest in Western Europe. Any of these areas could offer candidate sites of several hundred square kilometres, with similar challenges to the Welsh project – and one such area managed by two major landowners – the government's Forest Enterprise and the independent National Trust at Ennerdale in the western part of the Lake District is subject to a minimal intervention and relatively mild programme of 'rewilding' that seeks to balance all of the competing interests. Lowland potential is limited but the National Trust plans to restore 10,000 ha of fenland near Cambridge over a 50 year period.



In respect of the competing interests of farming, tourism and game shooting conservationists are ill-advised to draw lines on maps and start planning ecological restoration programmes! The best way forward is for local community initiatives to begin the long and laborious process of education and cooperative endeavour. In this respect, only Dartmoor holds such potential, with a well-established group, community programmes, lectures and conferences to communicate with a plethora of stakeholders in agriculture and the National Park.

Dartmoor has a small population of red and roe deer, and a large population of feral horses of mixed provenance (nearby Exmoor National Park holds a wild population of primitive tarpan-like ponies that are often used in for conservation management of wild land elsewhere) and is also heavily used for sheep and cattle rearing. Although the National Park, like Snowdonia, is relatively large, at 953 km², land uses present major problems in the north (military training zones), the south-east (ancient 'common' grazing rights, and areas of high conservation value for plants, insects and birds associated with unimproved pasture land). Only in the south-western 200 km² is there a promising *wildland* zone, with the National Trust owning significant land.

Opportunities for carnivores are more limited than the other sites, but lynx would be possible. Dartmoor and the neighbouring Exmoor National Park already have a reputation for supporting feral big cats, including recent reports of breeding puma *Puma concolor*!¹²

Economic change in the upland regions

The potential for realising these large-area schemes outside of Scotland depends very largely upon government policy relating to livestock husbandry in the uplands. Virtually all UK upland farms have been uneconomic and subsidy dependent for the past 10-15 years. This production-support policy has led to overstocking and degradation of semi-natural areas. Hill-sheep range over unfenced upland heath and bog converting rich floristic associations to large expanses of species-poor acid grassland. With pressure mounting through global trade agreements to limit such

subsidies, agricultural reform is underway. In Wales there are schemes to reward upland farmers for better practice and there has been a shift away from ‘headage’ payments toward payment for environmental improvements. However, such schemes cannot be expected to arrest the economic decline, and this has motivated government to assess the feasibility of land-use changes toward forest habitat networks. In addition, carbon sequestration in mitigation of climate change under the Kyoto Protocol is being given more serious consideration than a decade ago.

These economic changes, together with a generally declining market for meat, following BSE and the Foot and Mouth epidemic, which severely dented both farmers’ confidence as well as consumers, lead us to believe that new policy initiatives will receive a steadily more favourable hearing in government.

Research agendas

The official re-introduction of large carnivores may be several decades away but an education and lobbying programme has begun in the form of a generalised *wildland* ethic that would return large areas to be subject to natural processes rather than intensive conservation management. This means re-establishing native herbivore grazing regimes, with predators, in a semi-natural forest environment (accepting that totally natural ecosystems cannot be re-created in Britain). In this endeavour there is a shortage of research, at least in Britain, on the dynamic relationship between native herbivores, especially browsers, and the forest vegetation, as well as predator-prey interactions.

In addition, specific predator management issues such as:

- as viable population sizes,
- habitat fragmentation,
- gene-flow and isolation,
- diseases,
- effects upon smaller carnivores and bird populations,

are all relevant, as are policy issues relating to compensation and control.

The authors are particularly interested to make contacts and become familiar with the work of scientists from those countries with active experience of predator management, re-introduction programmes and data on forest dynamics. The British environment will, of course, have its unique elements, not the least of which is the proximity of large urban populations to wild areas, intensive agriculture and a fragmented natural environment, and it is perhaps from similar areas in Europe, that we have most to learn.

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