



REVIEW OF STATUS AND CONSERVATION OF WILD LAND IN EUROPE

FINAL REPORT

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About the Wildland Research Institute

The Wildland Research Institute is a unique UK-based research group specializing in research and policy development relating to wilderness and wildland. The Institute aims to address the research requirements, strategies and policies for a transition to a greater presence of wild landscapes and natural processes in the UK, Europe and the world.
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EXECUTIVE SUMMARY

This report sets out to research, describe and analyse the status of wild land in Scotland within a European context, by specifically:

- mapping its extent and location;
- identifying the primary characteristics of wild land;
- placing them within a spectrum of wild land across Europe;
- assessing the elements that provide the best protection for wildness

Key findings

The key findings of the research are summarised as follows:

a) European-level thinking and developments

- Within Europe there have been some moves towards wider recognition of wilderness after the European Parliament resolution called for special status and stricter protection for wilderness zones in Europe and the Natura 2000 network.
- The Czech Presidency and the European Commission hosted a conference in Prague organised by the Wild Europe Initiative on "*Wilderness and Large Natural Habitat Areas in Europe*" which has given rise to various initiatives including a Wilderness Think Tank and Wilderness Support Network. Work on developing guidelines for the management of wilderness and wild areas in the Natura 2000 system has also been initiated.

b) Outputs from European analysis

- A Wilderness Quality Index for Europe has been developed, based on existing work for the Prague conference and the EEA Mountain Report (see Figure 5.1). This has been used to make spatial comparison between wilderness areas and mountain areas, Natura 2000 sites, IUCN protected areas, and Natura 2000 Annex 2 species.
- Wildland is closely associated across Europe with protected areas classified under the IUCN system, with Categories I and II showing a best fit with the top 5% WQI in Europe. The ability to designate protected areas in IUCN Categories I, II and III is widespread in the legislation for national protected area systems across Europe. The protected area legislation for these categories lays down restrictions on extractive use, as well as physical development, as the means to protect wild land. Zoning and ecological networking are also widely included in national protected area legislation. Public ownership of IUCN Category I and II protected areas is prevalent across Europe.
- The PAN Parks Foundation has provided a system of uniform wilderness designation and verification to supplement national protected areas systems. PAN Parks combine wilderness protection and sustainable tourism development.
- Lessons from comparisons with analogue protected areas in Europe indicate an ideal for successful protected areas for wildland. Getting the right balance and spatial relationship between natural values compared to cultural values (nature conservation and human use) are the key aspects.

c) The Scottish context

- While the groundwork on developing national policy definitions of wild land has already been laid by SNH, NTS and JMT, there is a need for a common and rigorously defensible definition of wild land in Scotland.
- There exists a distinction between biophysical wildness and the perception of wild land in Scotland. This seeming diversion is most easily understood in terms of the wildland continuum. Thus agricultural, semi-natural (semi-agricultural) and natural (near-natural) landscapes all appear at different parts of the continuum.

In Scotland, effort to safeguard wild land has focused on maintaining the qualities that are valued for recreational use, in particular by managing potentially intrusive built development through the planning system rather than, as across many parts of continental Europe, where safeguarding “wilderness” is strongly driven by nature conservation centred on biodiversity.

Recommendations/opportunities

Areas of wild land character in some of Scotland’s remoter upland, mountain and coastal areas are very sensitive to any form of development or intrusive human activity. As pressures increase on land resources it will be important to identify these areas and agree what should be safeguarded.

With this in mind the report identifies the following opportunities:

- The definition of wildland requires further consideration in light of the distinction between biophysical wildness and the perception of wild land in Scotland. This could inform future mapping work, legislation and policy decisions.,
- By comparing maps of wild land quality across the whole of Scotland with the protected area boundaries (see Figures 8.1-8.7) it can be seen that the National Scenic Areas network presents the best fit, and therefore the greatest opportunity for developing mechanisms for wild land protection within existing systems;
- Biosphere Reserves provide an exemplar of zoning within the current non-legislative approaches to protected areas in Scotland. In the proposal for Galloway and South Ayrshire, the extent of public ownership in the core and buffer zones, coupled with the low population in the core, provide an ideal opportunity to explore their joining together with the surrounding cultural landscape.
- There is an opportunity to classify new and existing protected areas in Scotland under IUCN categories, including the application of zoning principles and aspirational plans. There are a number of Scotland’s existing protected areas that contain areas that could be classified as IUCN Category Ia/b, II or III.
- Scotland has mapping for extensive Forest Habitat and Lowland Habitat Networks with opportunities for networks to protect endangered species, such as the wild cat.
- Finally, it has been shown in other countries across Europe, for example, as in France with the “*Le Grenelle Environment*” initiative , that public support and involvement is often the key to securing long-term sustainable plans that are acceptable to as wide a range of stakeholders as possible.

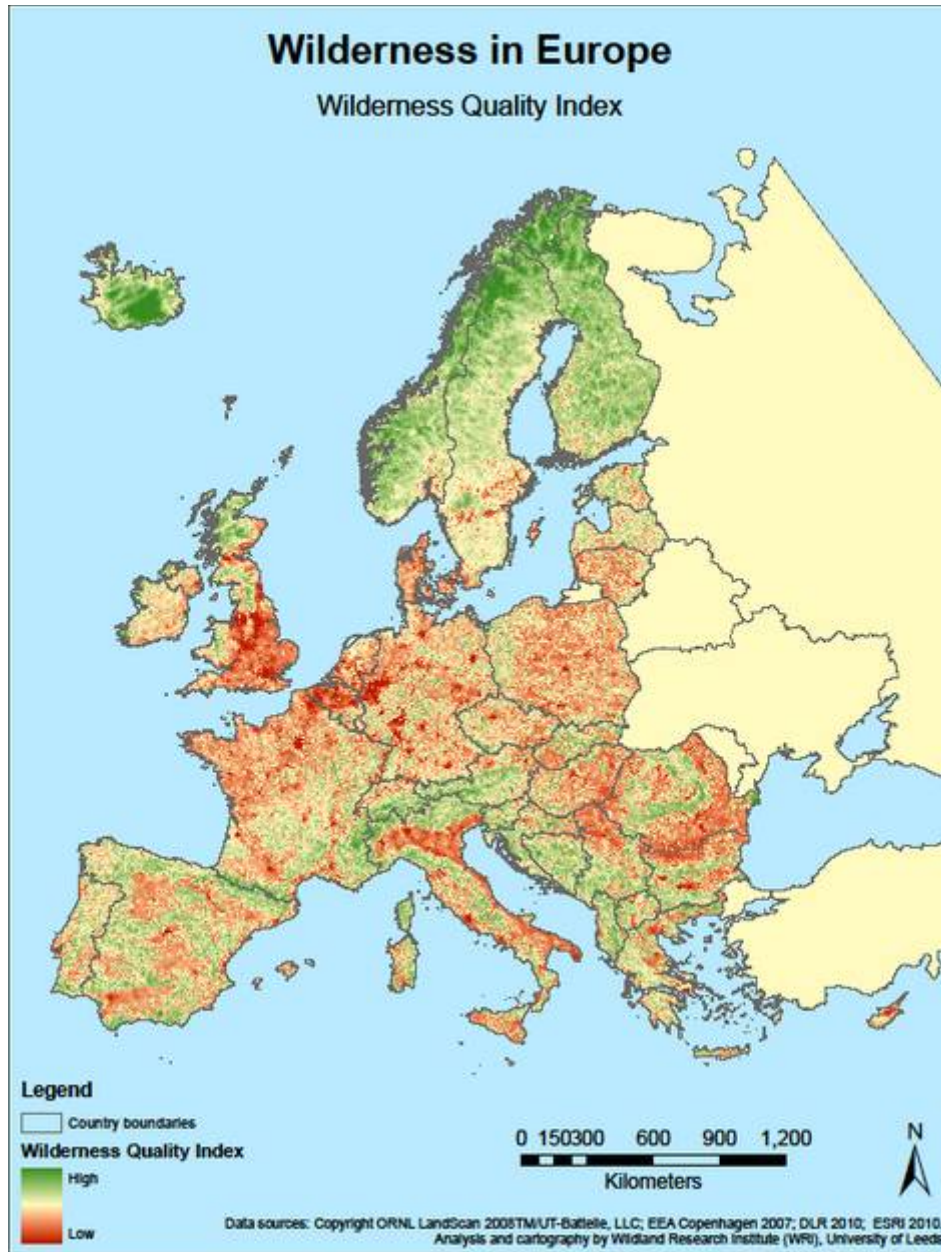


Figure 5.1 Wilderness quality index for Europe

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CHAPTER 1 INTRODUCTION

This report sets out to undertake the first fully comprehensive review of the status and conservation of wildland in Europe. The report is timely in respect to developing a response to the European Parliament Resolution on Wilderness (February 2009), the Prague conference on *“Wilderness and Large Natural Habitat Areas in Europe”* (May 2009) and the publishing of the *“Message (Poselství) from Prague”* that lays out 24 different recommendations from the conference on policy, research, awareness raising and partnership building.

The report is set against a background of rapidly decreasing wilderness on a worldwide scale, where Europe’s last remaining wild areas are under immediate threat from logging, agriculture, mining, recreational developments, climate change and, ironically, exploitation of renewable energy resources. Together this is resulting in the degradation, fragmentation and ultimate destruction of many wild areas across the continent. Despite this long-term trend in wilderness losses, it is clear today that wilderness areas may no longer be simply regarded as “wastelands” to be tamed and exploited for their natural resources including the lands they occupy, but as valued landscapes and habitats that provide both humans and wildlife with many of the core life-giving elements essential for the existence and maintenance of life on the planet.

This has given rise to the notion of ecosystem goods and services that the natural environment provides. De Groot (1) and the Millennium Ecosystem Assessment (2) divide these into four groups: provisioning services (food, wood, fibre, fuel & water), regulating services (regulation of water supply and quality, carbon storage and sequestration, etc.), cultural services (opportunities for recreation, spiritual, aesthetic or educational development), and supporting services (soil formation, biodiversity, nutrient cycling and primary production). It may be argued, quite logically, that few human controlled environments or ecosystems provide all these services in sufficient and equal quantities. However, wilderness and wildland can adequately provide all four, although the provisioning services of these areas are only optional values for future generations if they ever need to be called on.

That the intrinsic value of wilderness offers ecosystem goods and services was a fact recognised by participants at the recent WILD9 conference (9th World Wilderness Congress in Merida, Mexico) which published an international call to better integrate wilderness and biodiversity into global climate change strategy through the linking of the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD) (3):

“The UNFCCC and the CBD must again be seen as two parts of an inseparable whole; an integrated and closely coordinated response to global environmental degradation. For the good of the planet, the time has come for a major initiative to reunite climate change mitigation and adaptation efforts with biodiversity conservation and wilderness protection.”
(Message from Merida, 2009)

In addition there are many people and organisations that are looking seriously at re-creating more wilderness from the remnants of wildland and intervening patches of modified landscapes to restore networks of large core natural habitat areas along with their natural processes that are linked by wildlife corridors. These can then act as fully functioning ecosystems at both local and continental scales and further provide some of the ecosystem services mentioned above. National examples already in the process of development include the Dutch EHS (4) and the wider Pan European Ecological Network (PEEN) (5). Part of this restoration process is the reintroduction of native species (as Scotland has recently done with sea eagle and beaver) and the management of these areas along non-interventionist lines that focus management actions on minimising human impacts and allowing

natural processes such as succession to dominate and direct the process of development of these areas along wholly natural lines.

Wildland in Scotland may be viewed against this wider canvas of European and global developments in large scale, ecosystems-based wilderness thinking. While there may no longer be any true wilderness areas left within Scotland - the long history of human land use and the modified and impoverished nature of many of its ecosystems means that true wilderness conditions of unaltered environments and unmanaged landscapes simply don't exist - there are in existence significant areas of large, remote and semi-natural landscapes that we call wildland. It is this wildland, and it's counterparts in continental Europe to which this report is focused drawing, as appropriate, on the wider body of experience and knowledge to do with wilderness protection on a global scale.

The report is divided into eight main sections or chapters including this introduction in Chapter one. Chapter two gives an overview of the recent wildland agenda in continental Europe including a description and analysis of the drivers such as the European Parliament resolution and the resulting Prague conference. Chapter three tackles the problem of definition dealing with attempts to define wildland and quantify its history in Scotland, and what is potentially different about Scottish wildland when viewed against the European and wider international context of the wilderness idea. Chapter four reviews the Scottish track record and the local wildland agenda from early thinking and the legacy of Percy Unna through planning and designation of protected areas to contemporary policy developments. Chapter five looks in detail at the European system and experience of protected area designation with particular focus on the IUCN system of classification and Natura 2000. Chapter six deals with issues and implementation of IUCN and Natura 2000 across the EU and continental Europe, with particular emphasis on the lessons learnt that could hold resonance for the Scottish scene. Chapter seven continues this theme and uses biophysical and developmental analogues of selected Scottish wildlands found in Europe (e.g. the Cairngorms and the Hardangervidda in southern Norway) to draw out comparisons and similarities with continental contexts and systems of management from which we might derive examples of best practice for application here. Finally, Chapter eight attempts to draw out a series of key opportunities for consideration in developing future policy and action on wildland in Scotland.

CHAPTER 2: WILDLAND ON THE AGENDA IN EUROPE

In a breakthrough moment for wild land in Europe, the spark of an idea from a roundtable meeting in September 2007 cascaded within a few months into a remarkable coalition for European wildland; a highly supportive resolution being adopted in the European Parliament at the beginning of February 2009; and followed up with a major conference backed by the EU Commission and Presidency taking place in May 2009. Thus in less than two years, the determination of a coalition of people and organisations was translated on the European stage into the potential of a mechanism for developing a continental policy and strategy on wildland. This chapter traces the events in Europe.

2.1 Wild Europe Initiative and the resolution

EUROPARC is a federation of national parks, regional parks, nature parks and biosphere reserves in 39 European countries. At its annual meeting in September 2007 at Český Krumlov, Czech Republic, EUROPARC hosted a round table meeting on "*Wilderness in the European Union*", attended by some 300 protected area experts from 24 European countries. They examined the concept of wilderness in the European Union, and discussed how to place wilderness on the European agenda, find ways of promoting its importance, and draw up guidance for the stewardship of wilderness (1, 2).

In October 2007, after the roundtable, many organisations joined together in a Wild Europe Initiative (WEI). The grouping was constituted as an initiative rather than an organization to ensure flexibility, and to avoid being seen to be linked to any one area or country (3). The Initiative was steered by a '*core group*' of personnel from the Council of Europe, Countdown 2010, EUROPARC Federation, European Commission, IUCN Europe, IUCN Global, IUCN Wilderness Task Force, Natuurmonumenten, PAN Parks Foundation, UNESCO, Wilderness Foundation, WWF Europe office and Carpathian Programme office.

The WEI aims to promote a coordinated strategy for protection and restoration of large natural habitat areas, often labelled as '*wild*' or '*nearly wild*' lands, through joint action among key players. By identifying, valuing and promoting the benefits of wildlands and large natural habitat areas, WEI will be assessing how best to translate the benefits into specific ventures bringing potential income and employment for local communities, farmers and landholders as well as society in general.

As a first act, the WEI published a Resolution on Wilderness Areas that was addressed to the European Commission and the EU member states. It emphasised the importance of protecting Europe's remaining large areas of natural habitat with non-intervention management, and pointed to the benefits of this wilderness in retaining biodiversity, support for sustainable communities, and for addressing climate change.

A key sentence in the resolution questioned whether there was an incompatibility for wildland with the EU system of protected areas (the Natura 2000 system)(2):

"We acknowledge that the Natura 2000 network provides a strong framework for conservation. However its requirement to maintain habitats in 'favourable conservation status' can be interpreted in such a way as to conflict unnecessarily with the protection of present or potential wilderness or wildland and their natural processes. This situation requires further guidelines on the best approach"

However, the challenge in the resolution to the Natura 2000 system was short lived as by June 2008, a revised version of the resolution was presented for endorsement with that sentence removed, and a new sentence included that called on the European Commission to develop appropriate recommendations that would provide guidance to the member states of the EU on the best

approaches for ensuring the protection of present and potential wilderness or wildland and their natural processes (4).

More than 100 organisations signed the resolution, including Countdown 2010, Eurosite, IUCN Europe, WWF and WCPA, as well as more than 30 EUROPARC members, such as the EUROPARC Sections in Germany and the Czech Republic. The resolution was subsequently submitted to Stavros Dimas, the European Commissioner for the Environment, in August 2008. Further advocacy by EUROPARC was carried out in Brussels in partnership with the Wild Europe Initiative, drawing on the support of all the networks involved, in an effort to generate momentum in the European institutions on the issue of wilderness.

2.2 EU Parliament Resolution on Wilderness in Europe

The Wild Europe Initiative resolution and lobbying proved effective, as a draft Report on Wilderness in Europe was drawn up by Gyula Hegyi, MEP, and the Environment Directorate in October 2008 for the Committee on the Environment, Public Health and Food Safety of the European Parliament. This report contained a motion for a European Parliament resolution on Wilderness in Europe. It was brought before the Committee in early December 2008, and was adopted by a vote of 33 to 1, with an expectation of the resolution being taken to a plenary vote of the European Parliament (5). As the Report on Wilderness in Europe was being drafted, the European Commission agreed with the Czech Presidency of the European Union to hold a conference on wild and nearly wild land areas in Prague for the following May 2009

The motion in the Report called on the Commission to give a special status to and stricter protection for wilderness zones in the Natura 2000 network, and that the Natura 2000 network should be strengthened further to become a coherent and functioning ecological network in which wilderness areas have a central place. In an Explanatory Statement to the Report, it was noted that the European network of Natura 2000 covers most of the valuable and bio-diverse areas of the European Union, which the author took to mean that at least a big part of European wilderness is protected under the Natura 2000. It goes on to say:

"There is no need for a new legislation concerning Wilderness, but it is highly recommended to give a special role and extra protection for Wilderness zones inside Natura 2000. That's why European Commission should develop appropriate recommendations that provide guidance to the EU Member States on best ways of ensuring the protection of present and potential wilderness or wildlands and their natural processes, which are likely covered by the Natura 2000"

Concerns, however, about wild land and the Natura 2000 system continued as EUROPARC members Sumava National Park, Czech Republic, and Bavarian Forest National Park, Germany, hosted an international colloquium of researchers and managers of protected sites on 25-28 January 2009 in Srdni, Sumava National Park, Czech Republic, on the subject of "The appropriateness of non-intervention management for protected areas and Natura 2000 locations" (1).

The conference report "*Europe's Wild Heart*" captures the breadth of enthusiasm for wildland and its nurturing across continental Europe in both the presentations (on CD) and in the brief essays that each of the presenters contributed. It is thus unsurprising that in the Foreword to the Conference Report, Ladislav Miko, Chair of Directorate B, European Commission, and Environment Minister for the Czech Republic, commended the outputs of the conference as an important background to the upcoming EC Presidency conference on "*Wilderness and Large natural habitat Areas*" (Prague - see earlier) and that managers of Natura 2000 locations all over Europe would use it for their everyday work (6).

An important principle was identified by a number of speakers at the Conference, and in the Final Conclusions of the Conference Report; namely that a distinction needs to be made between Primary and Secondary Habitats designated under the Natura 2000 system. This is because the natural processes occurring in Primary Habitat under non-intervention management are able to meet the demands of developing or guaranteeing a favourable conservation status for a designated Natura 2000 site. As is implied by its appellation, non-intervention management is incompatible with the favourable conservation status of a Secondary Habitat that is designated a Natura 2000 site. The importance of this is that it leaves little scope for dynamism and return of natural ecological function in these protected areas as the requirement is to maintain them without "deterioration" of the secondary habitat for which they are designated. This will be explored further in section 6.2.

From committee stage, the motion on the resolution was scheduled go to the European Parliament on 3 February 2009. As a means to provide background information before the plenary vote, a mini conference on Wilderness Areas in the EU was held on 28 January 2009 in the Parliament Building in Brussels (7). As well as speakers calling for support for the resolution, and introducing the Wild Europe Initiative, other speakers addressed the continuing discussion about the suitability of the Natura 2000 system for wilderness protection, one using the example of the PAN Parks wilderness system of untouched core zones, in which no extractive use such as forestry or hunting are allowed and where the only management interventions are those aimed at maintaining or restoring natural ecological processes. PAN Parks is a pan-European organization that provides third party certification of wilderness core areas in large scale nature parks (8).

The vote on the Wilderness in Europe resolution was carried by 538 votes to 19, with 12 abstentions. It was a non-legislative resolution that brought forward a range of recommendations for the European Commission to take up, including (9):

- defining wilderness
- mapping it (untouched areas as well as minimally touched)
- studying wilderness benefits
- developing an EU strategy for wilderness
- developing new wilderness areas, promoting them, bringing in effective protection of wilderness areas
- accepting the Wild Europe Initiative
- welcoming the review of the Birds and Habitats Directives with a view, where necessary, to amending them so that wilderness zones are given special status and stricter protection in the Natura 2000 network
- getting Member States to set wilderness conservation as a priority in their strategy to address climate change; and
- forwarding the resolution to the governments and parliaments of the Member States.

The resolution on wilderness was adopted on the basis that no new legislation would be required to achieve the aims of the resolution, as had been trailed in the Explanatory Notes to the Report on Wilderness in Europe. However, Gyula Hegyi, the Hungarian MEP who proposed the resolution, was concerned that there had been no opportunity to debate the resolution in the plenary, or table amendments to it. He had raised this issue in his speech in support of the resolution before the vote, as well as the presumption of no new legislation (10):

"Many aspects of the Natura 2000 Directives should anyhow be reopened in the near future and hopefully the legislative act will cover the wilderness areas as well, giving full opportunity for the next Assembly to go further on this beautiful topic. I hope that my resolution will become a basis for further legislative actions providing the possibility for the Members to improve it in the future"

There was no media coverage of the Resolution in Britain, sparse coverage in N. America (11) and little coverage across the rest of Europe. However, PAN Parks issued a News release, with Vlado Vancura, their Conservation Manager, saying (12):

"Approval of the report on Europe's Wilderness by the European Parliament is - without any exaggeration - a historical event. The report helps to revive and redefine the concept of wilderness protection in Europe, a continent where most landscapes are culturally influenced and where continuing management intervention has often been seen as a necessary part of conservation. This achievement proves that time is changing and the wilderness momentum in Europe is growing. The EU Parliament sent out a clear message: wilderness in Europe is an important element of the agenda"

2.3 Government responses in Britain

Responses were sought to emails to Government Ministers responsible for nature conservation in Britain, asking them what their contribution could be to the recommendations contained in the EU resolution.

The Scottish Government replied, showing its support for wildland in Scotland, confirming that Scottish Natural Heritage would be attending the Prague conference, and that it *"looks forward to playing a constructive part in future discussions"* (see box 2.1)

Box 2.1 - Response from the Scottish Government

EU Resolution - Wilderness in Europe
24 February 2009

Dear Mr Fisher,

Thank you for your e-mail of 6 February 2009 to Michael Russell MSP, the former Minister for Environment, commending a Wilderness in Europe resolution that was adopted in the EU Parliament on 3 February 2009. I have been asked to reply.

The Scottish Government understands the importance of Scotland's wild places, and SNH research confirms its importance to Scotland's people. In August 2008, SNH produced a report entitled 'Public Perceptions of Wild Places and Landscapes in Scotland'. This was the first public survey to provide hard evidence of the general public's concern for issues of wilderness and landscape issues. The research used an approach designed to capture a representative sample of Scotland's population. It shows very strong public support for wild places, 91% of people thought that it was important for Scotland to have wild places.

In Scotland wildness is currently safeguarded through policy statements in NPPG14. This highlights the value and benefits wild places bring, their sensitivity to development and intrusive activity, and that they may have little or no capacity to accommodate new development. As part of NPPG14, local authorities are asked to "*include policies for protecting and enhancing the character of landscapes of regional importance, including any areas of importance for their wild land character.*" Some of NPPG14's policy advice is reflected in the parliamentary draft of the National Planning Framework 2 (paragraph 98). [*Should be para. 99*]

You may be interested to know that SNH have prepared a policy statement on Wildness in Scotland's Countryside and has recently undertaken work with the National Park Authority to develop a methodology to map wildness in the Cairngorms National Park area. Further work will be needed to ensure that this initiative reflects the ecological, cultural and economic circumstances of Scotland.

Finally, I understand that SNH will be attending the Prague conference and looks forward to playing a constructive part in future discussions.

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The Welsh Assembly Government also replied, saying that they had been advised by the Countryside Council for Wales that there were few significant areas of Wales that could still be considered wild. However, the assembly government *"is responding positively to the EU Resolution, and is taking an active role in delivering its aims in Wales in co-operation with other stakeholders and project originators"* (see box 2.2)

Box 2.2 – Response from Welsh Assembly Government

Welsh Assembly Government
3 March 2009

Dear Mr Fisher

Thank you for your email to Jane Davidson, the Minister for Environment Sustainability and Housing regarding the EU resolution on Wilderness in Europe. In 2003 the then Deputy First Minister commissioned an internal report called "Wild Wales", and the Welsh Assembly Government continues to take an interest in the topic. We are aware of this EU Resolution and welcome public interest and enquiries about it.

We have been advised by the Countryside Council for Wales that regrettably there are few significant areas of Wales that can still be considered 'wild'. Some small parts of narrow valleys and cliff habitats may be substantially unchanged since the last Ice Age, but the majority of Wales has seen extensive human activity since the beginning of the Neolithic period, approx. 6000 years ago. Even apparently wild areas like upland moors are likely to be the product of human land use.

However there are a number of projects in Wales to restore historic woodland and 'wild' landscapes. To our knowledge there are five initiatives in Wales registered with the Wildland Network. Responding to the "Wild Wales" report, Forestry Commission Wales will shortly begin creating over 1000 hectares of Caledonian Pine landscape in mid Wales, and are considering other possibilities. There are also a substantial number of Planted Ancient Woodland (PAW) regeneration projects and some heathland restoration projects. WAG supports these while recognising it is uncertain the extent to which PAW restoration can be considered 'wilding' as it usually involves species such as chestnut (both species), beech etc. which came into Britain after the initial natural process of afforestation. Likewise Heath is generally considered to be the consequence of human land use followed by neglect, sustained by light grazing by animals which may be domestic or introduced by humans (eg rabbits) as well as truly native/'wild'.

WAG is responding positively to the EU Resolution, and is taking an active role in delivering its aims in Wales in co-operation with other stakeholders and project originators.

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DEFRA did not respond.

2.4 Conference on Wilderness and Large Natural Habitat Areas

The Conference on Wilderness and Large Natural Habitat Areas sponsored by the European Commission and the Czech Presidency of the EU took place in Prague 27, 28 May 2009. The Conference, which was by invitation only, brought together policy makers, academics, civil society and other interested groups and individual experts, a total of 235 participants from some 35 countries (13). The main objectives of the Conference were:

- To recommend a unified strategy for protection and restoration of wild and nearly wild areas
- To build a partnership between sectors based on consensus for implementing this strategy

Building on these objectives, the conference aimed to:

- Agree the definition and location of wild and nearly wild areas
- Determine the contribution that such areas can make to halting biodiversity loss and supporting Natura 2000
- Make recommendations for improved protection of such areas, within the existing legal framework
- Review the opportunities for restoration of large natural habitat areas
- Make proposals for more effective support for such restoration
- Identify best practice examples for non intervention and restoration management
- Define the value of low impact economic, social and environmental benefits from wild areas

The build up to the conference was supported by the production of a range of background briefing documents. These included discussion documents on the benefits of wilderness and wildlands; a definition of wild and nearly wild areas; valuing and utilising the benefits of wild areas; climate change mitigation efforts with wilderness protection and biodiversity conservation; the key aspects of management practice, including non-intervention, restoration, and rewilding through natural process; an overview of wilderness and wildland law; and an assessment of the multiple roles of business in supporting wildland strategy.

An early outcome of the conference was the development of a *Message from Prague*, containing 24 recommendations identified by the participants, that included policy development, research and awareness building, and supporting capacity as key elements for an ambitious agenda that will create a wilder Europe, both in EU and non EU regions (14).

The Proceedings of the conference followed later, and provided a synthesis of the presentations, workshops and of the pre-conference briefings in a coherent and compelling commentary on wildland in Europe, its status, benefits, protection and restoration, and next steps (15). It contains the recommendations from the *Message from Prague*, and states the intention to develop an Action Plan to carry forward their implementation over the next few years, with development of a Wildland Support Network to help coordinate this process. In the section on "*Next Steps: The Wild Area Agenda*", the closing speech of the Conference by Ladislav Miko was summarized in which he highlighted some of the recommendations from the *Message*:

- To invest in mass communication to the wide European audience about wilderness and wild values;
- Finalisation of a definition of wilderness and wild areas, taking into account the range of ecological and cultural interpretations of these terms and their application in different parts of Europe;
- Develop a wilderness register – mapping existing wilderness as a basis for tailored protection plans
- Quantification of the value of non-extractive economic, social and environmental benefits of wilderness and wildland, identifying key beneficiaries;

- Further development of the Wildland Support Network, especially to support implementation of recommendations from the conference;
- Undertake a full assessment of government, institutional and private sector funding opportunities for protection and restoration.

The Wild Europe Field Programme was launched at the Prague conference but it is still at the initial assessment stage, with the actual mechanism for securing restored areas in the long run still to be determined (16). Other activities set in motion after the conference included the drafting of a Wilderness Register to record, in priority order, those areas of greatest value, assess the level of threat and evaluate alternative approaches to securing appropriate protection; development of large scale examples of how wild areas can deliver funding through ecosystem services - particularly old growth forest; promoting the value of wilderness as a topic within the EU Post 2010 Biodiversity Strategy; establishment of a Wilderness Working Group within Wild Europe to progress policy needs identified and including finalisation of a practical definition of wilderness and wild land in different parts of Europe; and secure appropriate funding and policy potential and organization of a second EC Presidency conference, on restoration, in Brussels in 2010 (17).

Voluntary initiatives have taken place, with PAN Parks assembling a consortium of researchers to apply to the EU 7th Framework Programme for funding of wilderness related research. It has also set up a wilderness *"think tank"* that supports the Wild Europe Initiative through its steering group (18).

2.5 Guidelines for the management of wilderness and wild areas in Natura 2000

One of the recommendations from the Prague conference, noted in the Presidents report (19) was the need to understand the relationship between the protection of wilderness areas and the Natura 2000 system, and produce guidance addressing issues such as natural changes to sites, response to climate change, the maintenance of specific succession states and non-intervention. In this regard, the Presidents report gave an indication of a key issue that would need resolving in that guidance:

"Within the EU itself, some of these [undisturbed/non-intervention/pristine] areas are part of the Natura 2000 network, the principal EU instrument for nature conservation, which is essentially not a network of strictly protected natural areas, but areas where human, economic, social and cultural activities are integral parts of management"

An Expert Group on Natura 2000 Management met for the first time in November, 2009, and then again February 2010 (20, 21). The group was established under the Co-ordinating Group on Biodiversity and Nature (22). It is comprised of experts from the Member States' competent authorities, the Commission services and major stakeholder groups (e.g. European Habitats Forum, Natura 2000 Users Forum). The primary focus of the group will be to assist the Commission in promoting the exchange of experience, expertise and good practice on the management of Natura 2000 with a view to attainment of favourable conservation status of species and habitats of EU conservation interest and fulfilment of the objectives of the Habitats and Birds Directives. As an early task, this group is assisting the Commission in developing guidelines on specific topics linked to the management of Natura 2000 sites.

It was reported during the first meeting of the group that the Commission was already planning for a contract on *"wilderness and wild areas and Natura 2000"*; and information was provided on the contract at the second meeting of the group in February 2010. A closed tender for the contract was issued, part of which is available online (23), and from that it can be seen that a report on best practice examples of wilderness management in Natura 2000 sites is referenced from PAN Parks.

The section of the tender document available indicates that the aim of the contract is to provide

input to draft guidelines on the management of wilderness and wild areas in Natura 2000 sites. The work is to be undertaken in association with the Expert Group on Natura 2000 Management, and the objectives of the contract are:

1. Review of the literature on definitions of wilderness, existing initiatives and legislative and statutory measures in Member States to protect wilderness and wild areas and propose a working definition for wilderness, taking into account characteristics relating to biological and anthropogenic qualities of wilderness;
2. Clearly establish the link between Natura 2000 sites and wilderness and analyse the role of Natura 2000 network in the protection of wilderness;
3. Select and present a set of case studies representing different types of wilderness and wild areas;
4. Analyse pressures affecting wilderness areas and review the qualities of wilderness and wild areas in terms of resilience and capacity to adapt;
5. Describe key ecosystem services provided by wilderness areas;
6. Produce input to draft guidelines on protection and management of wilderness and wild areas;
7. Present an analysis of the means, objectives and feasibility for restoration measures leading to the development of wilderness and wild areas;
8. Provide cases of good practices on approaches monitoring of wilderness and wild areas, and on typical financial needs for wilderness and wild areas;

With a contract period of 12 months, it would appear that the eventual guidelines are unlikely to be finalised before the second half of 2011. There are critical implications for wildland as a result of these guidelines, and this will be discussed in section 6.2, where it is recognised that the designation of a secondary habitat under the Natura 2000 system would require that designation removed if the aim was to restore wilderness, and that the dynamism in primary habitats due to natural forces should not result in an unfavourable report for a Natura 2000 site.

CHAPTER 3 WHAT IS WILDLAND?

3.1 Introduction

This chapter draws together a range of sources that provide guidance in the defining of wildland in a British and European context. It does not attempt to say where wildland is, rather it shows that an appreciation of what wildland could be is essential in understanding where to look for it, and how best to maintain its character. The first two sections use recent commentaries by Adrian Philips on national parks as a background to focus attention on the issues involved in understanding wildland, the role of national park legislation, and on two policy initiatives that arose in the 1990s on wilder areas in the national parks of England and Wales. A selection of studies of wildland in Scotland is used to survey the state of its understanding there. A contrasting view of wildland and nature conservation between Britain, America and Canada is given before looking at how the definition of wilderness and wildland is developing in Europe.

3.1.1 A wildland temporal

"But the wild places within our parks are now so much less wild than they were, and so much less wild than can be found in parks in other parts of the world, even nearby in Europe, that they no longer provide that challenge to our citizens – young people especially – that the founding fathers had in mind"

Adrian Philips, National Parks in the 21st Century – Time to Face Reality (1)

Philips was speaking at the National Park Societies' Conference in Wales in 2007 when he made these comments. He was arguing that the national parks of Britain had to compete with other places around the world in terms of the attractions that they offer people, especially young people. He acknowledged that British national parks were *"pretty tame"* by comparison with the national parks of many other countries, accepting though that they were different in that they were lived-in working landscapes, or protected landscapes in the IUCN category classification (see later, in section 4.5). His antidote to this tameness was to commend a greater reliance on natural processes in national park areas, such as vegetation succession, river dynamics, weathering of rocks, soil erosion and woodland regeneration. That he would call this a functional view of *"re-wilding"* risked the response of a teleological quest to determine what the word *"wild"* meant and whether true wildland exists in Britain.

Should words like *'wilderness'* and *'wildland'* be a free-for-all in terms of their meaning? They are certainly, to some extent, a movable feast in Britain, depending on perception or belief, and whether positive or negative attributes are associated with them. The central issue for those that ascribe positive values is that anthropocentrism inexorably contests wilderness and wildland where ever it has claims to existence, legislatively or otherwise (2).

Thus, wilderness in America is contested because of an underestimation of the effect of native peoples in managing the land through fire and simple native horticulture (3) but note that this impact in itself was vastly different from the effects that came with Euro-American settlement, bringing with it agriculture and the tending and cultivation of non-native species (see later in section 3.4). It is argued therefore that the wilderness we see today in America is a *"freakish landscape far outside the known historical variability"* because it is a land removed of cultural drivers (4) and which developed after the removal of native peoples (5). However, the Americas were not populated with modern humans until the Clovis people became established in North America after crossing the Bering land bridge some 13,000 years ago (6). Thus a biophysical wilderness land, as in *self-willed* in the absence of people, was there before humans arrived in the form of the Clovis culture. This would also be the

case for other locations in history, such as New Zealand, which has only been inhabited for the last 1,000 of the 80 million years since it split off from Gondwanaland (7); Iceland has only been populated for 1,100 years (8); and Madagascar for 2,000 years (9).

That a biophysical wilderness ever existed in Britain is also contested, but this disregards for instance the period after the last glaciation, when the ice that covered most of northern Britain receded, allowing the land to re-vegetate before it could support any returning mammalian life (10). Hunter-gatherer cultures would have required that an ecologically-rich wilderness composite to have returned before those lands could be occupied again. Thus Jacobi, in considering a likely population of Mesolithic lowland Britain based on the food resource available to them, worked through the density of deer available (one per 40ha), the potential success of hunting (1 in 6) and the nutritional value arising from deer kills; the density of coastal shellfish beds; and the distribution, harvest potential (30%) and calorific value of hazel nuts (11). His estimate for one southern lowland area of 6,500 square miles was that the landscape would have supported some 396 five-member family groups, a total of 1,980 individuals. Others have estimated the population of Britain around 9000 BC to be 1,100-1,200 people, rising to 2,500-5,000 by 7,000 BC (12). In 3,200 BC, the early period after farming reached Britain, the estimate of population is between 30,000 - 50,000 and was probably boosted by inward migration (13).

Would those Mesolithic hunter-gatherers, at such low population densities, have had a significant impact so that the wilderness characteristic of Britain post-glaciation was actually very short-lived? Undoubtedly, there would eventually have been a transition to the domestication of native plants within a natural landscape, and fire was perhaps more significant in usage than some authors would allow (14). But agriculturists did not arrive until many thousands of years after that rewilding had occurred, and thus were not there to exploit and maintain that initially denuded landscape with their own crops, livestock etc. So it is likely that the wildland characteristic of Britain remained for many millennia, with the threat from agriculture coming much later (15):

".. whatever was happening in Britain up to the fifth millennium BC in the relationship between Man and his environment, at some moment before 4500 BC a first boat arrived from the European mainland containing people who expected to live by farming. It was doubtless followed by others"

There is a more recent example of wilderness existing from "natural" creation. After a final glacial surge in the Little Ice Age of the mid-18th century, the area known as Glacier Bay on the SE Alaskan coast was covered in ice 4,000 feet thick, forcing the native Tlingit people to abandon their villages (16). The ice receded rapidly, withdrawing 60 miles inland in just 120 years, followed by successional vegetation that created a mosaic landscape, and with the wild mammals moving back in. It's an area much studied because of this complex of spatial and temporal change. First becoming a National Monument in 1925, the 3.3 million acres of this rewilded landscape is now mostly designated wilderness under the National Wilderness Preservation System of America, and makes up what has become the Glacier Bay National Park and Preserve.

3.1.2 Wild by Design

Philips was a notable choice to deliver a speech on Britain's National Parks, as he is a Vice president of the Council for National Parks and has had a long track record as an exponent of protected landscapes within the IUCN, the international body that issues guidelines on the management categories of protected areas (17). He may not seek to justify his recipe for re-wilding on the foregoing analysis of the existence and creation of wilderness, but his focus on natural process is certainly supported by that analysis. Philips later gave a speech during an event in 2009 to mark the achievements of the National Parks and Access to the Countryside Act 1949. He felt that the Act had

been of significant importance in helping to protect much loved landscapes in a period of great change and against many threats (18). However, he believed that several of the central premises that underpinned the 1949 Act were now serious shortcomings in being able to provide that protection.

One of those shortcomings was that *'natural beauty'* was used as a central concept in the Act. He contested the accuracy of using those two words together when he asserted that there was nothing natural about much that was regarded as beautiful in the English landscape. In addition, he drew attention to the special status accorded to farming and forestry. It was an assumption in the Act that the land users, farming and forestry in particular, were essentially benign forces as far as landscape and wildlife in the national parks were concerned.

Philips thus believed that the fate of much of the landscape, wildlife and historic heritage had been left to the decisions of land owners and land managers with virtually no external control, support or guidance to persuade them to take environmental considerations into account. They thus operated outside of the scope of public policy in the environment - that is until the forerunners of the present agri-environmental measures were introduced. Now, the public interest in what happens on privately owned land is represented by contemporary agri-environmental schemes that seek to modify and mitigate the affects of farming, quite often in the national parks by reducing grazing pressure. It should be remembered though, that these schemes are voluntary.

It is perhaps disappointing that Philips, in his two speeches on national parks, was in effect delivering a poor verdict on the outcome of two significant policy initiatives of the 1990's that focused on wildland and land use in the national parks. In 1991, a panel appointed by the Countryside Commission, reviewed the National Parks of England and Wales (19). The view was that since their designation, there had been a significant loss and deterioration of some of the wilder habitats in the national parks due to intensification of land use. There was thus a need to restore semi-natural habitats generally, the panel recommending that:

"...[a major aim should be]... to restore and extend their wilder areas by encouraging a reversion to semi- natural vegetation based on low density grazing, especially in areas which have been ploughed or 'improved' since the National Parks were set up"

The Panel went even further in Recommendation 6.3, where they proposed the following:

"A number of experimental schemes on a limited scale should be set up in the National Parks, where farming is withdrawn entirely and the natural succession of vegetation is allowed to take its course"

In the following year, Government endorsed this proposal for experimental '*wilder areas*'; and the Council for National Parks examined the recommendation as part of a wider range of options for enhancing the wilderness qualities of the Parks. Funding was secured for a Policy Officer who undertook a literature survey, detailed research in six of the national parks, and consultation meetings with National Park Authorities, statutory nature agencies and NGOs. The potential impacts of creating wilder areas on wildlife, public enjoyment, landscape and economic and social issues were investigated and Wild by Design, a report and recommendations on implementation, was published in October 1997 (20) with a seminar held in Newcastle upon Tyne in the following year.

In capturing the idea of a sense of wilderness, the report recognised that the main attributes of wilder areas were that there was a lack of obvious human management or intensive productive use. A distinction was then made between near-natural and semi-natural areas, where in the former natural processes were encouraged to maintain the diversity of habitats, and the vegetation was free to vary naturally with variations in the physical environment. In contrast, semi-natural habitats arose from agricultural or forestry use.

In terms of 'creating' wilder areas, two approaches were given:

- Promotion of the wilderness quality of an area while maintaining productive use, often accompanied by creating or enhancing semi-natural habitats
- Promotion of areas where ecological processes can be paramount - near-natural areas

It was noted that some of the perceived qualities of the semi-natural areas had been eroded by human activities, such as the enclosure of open land and the proliferation of fencing, intensification of use or improvement of the land, planting of non-native woodland, canalisation of water courses, and inappropriate physical developments. It could be possible to enhance the sense of wildness and improve the quality of experience by making changes to some of these, as well as beginning the process of ecological restoration.

On promotion of areas where ecological process could be paramount, it was noted that there were surprisingly few areas in England and Wales that had been left totally without management over long periods, and that the majority of places that had been left to develop naturally had done so incidentally because of their inaccessibility or low agricultural potential, or as a byproduct of their principal use. After giving some examples, which gave opportunity for study of this approach to wilder places, the report concluded that:

"The real challenge is to have the courage and commitment to leave minimal intervention areas on a much larger scale (landscapes of thousands of hectares) and over much longer time periods (hundreds of years)"

What, however, would be the incentive for private landowners in the national parks to grasp such a challenge? Philips would perhaps argue that such public policy could be supported by contemporary agri-environmental schemes, but the indication is especially in the uplands that apart from reducing grazing levels, they are designed to keep landscapes farmed rather than given over to ecological restoration. Thus the Management Plan from 2003 of the Northumberland National Park gives us an indication of how this challenge was regarded in what is principally a private ownership of land in national parks (21):

"Any possibilities for wilderness re-creation are likely to be opportunistic and dependent on large-scale changes in land-use or land ownership. It is inherently difficult to plan for such eventualities. Communities or landowners may bring forward such proposals themselves. Our target is to have set up an experiment before 2012"

3.2 Wildland in Scotland

This section looks at the three main studies in recent years that have engaged with the public in Scotland on the wildness of their landscapes.

3.2.1 Visual perception of wild land in Scotland

In a study of the visual perception of wildland in Scotland, Habron (22) asserted that a uniquely Scottish version of the concept of wild land had developed, which had to take into account the cultural and ecological history of the Highland landscape. He then made the mistake that many have done before in ascribing the term "*pristine*" as a criterion that is important in the wilderness areas of America. The word does not appear in the Wilderness Act 1964. It has been noted that it is the detractors of wilderness that have linked the word *pristine* to wilderness so as to make it an impossible criterion to fulfill (23). Habron, using that criterion as a basis for ecological integrity (biophysical reality) concluded that there was very little, if any, wild land in Scotland. He saw however a need to link the general perception of wild land with the landscape attributes and features that contribute to creating the notion of wildland in Scotland.

His study utilised photographic views in the Cairngorms and Wester Ross. The set of 48 photos had been derived from 119 on the basis that they had been tested and found to contain strong representations of the dominant landscape features, and which represented a continuum of land that was developed at one end and totally undeveloped at the other. Subjects were asked to rate each of the 48 photographs for three factors: wildness, beauty and naturalness. Individuals were left to define wild and beauty for themselves, but for naturalness they were asked to *'take into account the amount of human influence in the scene'*.

The results indicated that wildness, beauty and naturalness were separate concepts, between which all subjects were able to differentiate. However, there were more instances in which the wildness and beauty of the same image were rated differently, fewer in which beauty and naturalness differed and least in which naturalness and wildness differed, indicating to Habron that wildness and beauty were concepts between which the subjects clearly made a distinction, and therefore wildness as a term was supported. The mean wildness score obtained for the whole set of photographs ranged from a rating of 6.4 to 38.1. Habron concluded from his own inspection of the photographs that the ratings were higher where there was less evidence of human artefacts and influence. However, he did not quantify the occurrence of landscape features within the photographs.

Habron took other distinctions from the data. He divided his subjects into different groupings based on the personal data that they had supplied, such as occupation, leisure activities, membership of organisations, work location, and socio-economic status. He identified two groupings that consistently gave different wildness ratings than any other. A wilderness purism score group gave lower wilderness scores than others, whereas those with more education were more likely to give higher wildness scores. Habron gave no explanation as to why either should be the case, and perhaps that was wise considering the lack of evidence given on the basis for the groupings.

Habron's study raises some issues about the relationship between wildness and naturalness, and the effect that human influence has on those. These need exploring here. Naturalness is often distinguished as the most powerful factor in our preference for landscapes and is manifested by our liking for native vegetation in the landscape scene, especially trees, and for the absence of any overt man-made elements or discernible human-induced change. These are relative and scalable elements of naturalness, and our reaction to them may alter with experience as our *"eye"* becomes tutored, particularly with human-induced change as we begin to discriminate between structurally intact and altered forms of vegetation (24). Thus the influence through external management of a location has a direct bearing on this, as we can observe the physical effects of intervention management. This also bears on other elements of our discrimination - our experiential values - where the total amount of the vegetation and its density are as important as its intactness.

Wildness is something else again. In an ecologically perfect world, wildness would be essentially equivalent to naturalness – as was suggested by the lack of differential between them in the Habron study - but in the same way that human influence can decrease naturalness, so can it also detract from wildness (25). The cultural modification of landscapes, extirpation of species and the introduction of non-native species, presents us with a situation that a landscape may be wild if it is allowed to be self-willed or self-shaping, but it does not necessarily have high naturalness because the species mix and its ultimate ecological processes and function could not be what they were. It becomes increasingly inauthentic by any yardstick of native-ness.

3.2.2 The call of different wilds

McMorran and others (26) reported that an appreciation of wild landscape may be considered part of the national psyche in Scotland, conjuring up diverse images and associations for different people,

and with contemporary discourses about wild places having considerable popular and political resonance in Scotland. Their article, based on a study undertaken for SNH, explored the meanings and uses of the term 'wild land' in the Scottish context, and reported on the development of a typology that would give a snapshot in time of Scottish landscapes of wild character when, applied to a range of sites.

The authors note that in the Scottish context, the policy statements from SNH, the NTS and the JMT (to be discussed in the following Chapter) all differentiate between the two concepts of 'wildness' and 'wild land'; with wildness being the quality experienced through such values as remoteness and solitude, in contrast to wild land being described as "extensive areas where wildness (the quality) is best expressed" (SNH – see section 4.4.1). The implications, they suggest, were that wildness can be experienced outside of wild land areas and that, even within the SNH criteria, areas with different degrees of management and 'natural condition' qualify as wild land in Scotland. What this appears to be arguing for is recognition of a wildland continuum in Scotland, which will be discussed later in this chapter (see section 3.4).

The typology of 'wild landscapes' was developed through discussions with two groups: policy advisors and representatives of lobbying and landowning NGOs concerned with wild land; and with managers of wild landscapes. The discussions included an exploration of the concepts of wildness and wild land identification, and the opportunities and constraints in relation to the policy, planning and legislative context for Scotland's wilder landscapes. The typology proposed represented a concept for 'wild landscapes' that included both areas of wild land and areas of lesser wild character where the quality of wildness could still be experienced. It incorporated a range of detailed wild landscape criteria that could be applied to a broad range of sites across Scotland. The headings of the criteria were:

- Remoteness – distance from settlements and roads
- Perceived naturalness – of vegetation, land use and wildlife
- Degree of human artifacts – infrastructures, fencing, erosion
- Scale – area sufficient to provide physical challenge, striking topography or rugged terrain, wild landscape > 2,000ha, landscapes of wild character > 250ha

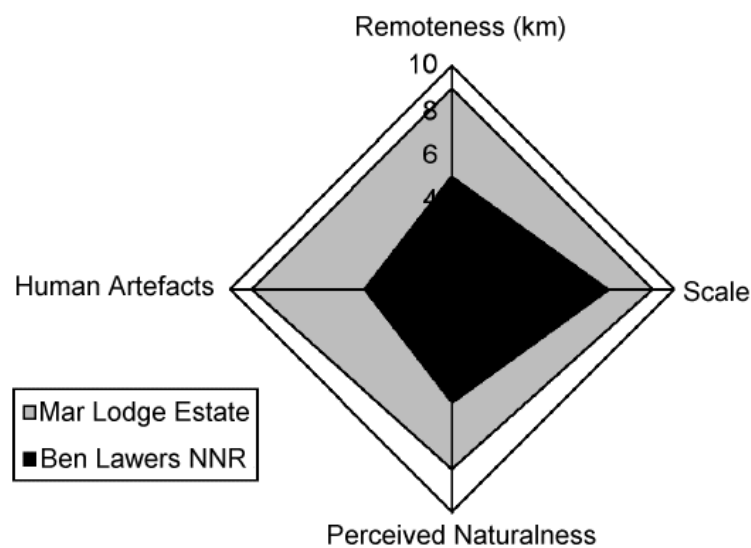


Figure 3.1 Theoretical positioning of two landscapes (Mar Lodge and Ben Lawers NNR) on a proposed grid of wild character (after Fig. 1 in (24).)

These criteria were spatialised as the four axes of a grid (see Fig. 3.1 above) from which four landscape types were derived:

Category 1A – Prime core wild landscapes (high in all four axes)

Category 1B – Compromised core wild landscapes (remote, compromised naturalness or may have some human artefacts)

Category 2A – Landscapes with wild character (wild character compromised in one or more likely two axes)

Category 2B – Landscapes with wild character (landscapes with wild character compromised in at least two axes)

In terms of scale, both category 1A & B areas would have a minimum area of 2,000ha, whereas category areas would be smaller, category 2B being the smallest. It was explained that the proposed landscape types could be divided into: wild landscapes (1A and B) which constitute areas of wild land; and landscapes with wild character (2A and B). Category 1A could perhaps be termed the wild land 'ideal'; but category 1B was also wild land – and such landscapes were likely to offer potential for restoration.

The typology was then applied to a range of locations in Scotland, based on known aspects of the sites and through discussion with land managers. A key observation was that some sites, such as Assynt, Skye and Glencoe, rated high on certain criteria and distinctly low in others. In the case of Glencoe, a public road running through the site led to a low overall remoteness rating, showing how one criterion in the typology could significantly reduce the overall wildness rating of Glencoe, even though it is often perceived as one of Scotland's most iconic wild landscapes.

The report then derived four main themes of management for wilder landscapes based on the response to the questionnaire given to land managers:

1. Large-scale woodland/habitat mosaic restoration. Emphasis on large-scale habitat restoration, particularly woodland, through natural regeneration and tree planting. Restoration based on expansion of existing semi-natural habitats or attempted creation of habitat mosaics and woodlands without core semi-natural habitats.
2. Conservation and access. Management based on conservation or improvement of in situ habitats rather than large-scale habitat restoration or species re-introductions. Promotion of recreational access usually important.
3. Natural processes/non-interference. Emphasis on non-interference and large-scale restoration of natural processes in areas of high habitat quality. Development of interpretative facilities and/or promotion of access usually of low importance. Deer fencing and tree planting usually not used.
4. Sustainable management. Strong emphasis on management for 'local community benefit' or maintenance of traditional land uses at low intensities. Emphasis on cultural components of wild landscapes, as well as ecological and recreational.

When these management themes locations were matched with their typology assignment, locations within categories 1B, 2A & B had management approaches across all four of the themes. It was only when ownership was taken into account that a pattern emerged of the sustainable management theme being more evident in the objectives of private, community and partnership-owned sites, whereas the other three themes were adopted on sites owned by NGOs and government agencies. It should be noted of course that the typology for a location would change with time if the management approach was that of Large-scale woodland/habitat mosaic restoration.

A number of respondents had noted that wildness varied considerably across their sites. For example, while the Mar Lodge estate was categorised as 1A, some parts of the estate closer to roads

and other infrastructure were more similar to the 1B or 2A categories. In addition, the authors noted that wild landscapes generally did not stop or start at an ownership boundary, and relatively 'wild' estates often shared common boundaries. Consequently, assessment of the wild character of specific landownership units had serious limitations, and suggested that the future application of the typology in the assessment and delineation of wild landscapes would require a degree of zoning, to differentiate between different categories of wild landscape at a landscape and regional scale. Zoning will be covered later in this Chapter (see section 3.4).

Their conclusions led the authors to believe that definition of the resource itself is central to the wild landscapes agenda in Scotland, with the need being for the development of detailed criteria for wild landscapes in planning and policy guidelines. This was also the case for a statutory definition of core wild landscapes so that they can be spatially located. Though spatial definition or designation could help to protect key areas in the long term, they noted that wildness can be experienced in a variety of settings, and future protective measures must take this into account in attempting to conserve the quality of wildness throughout Scotland – not just in core wild land locations. They also noted that many wild landscape managers did not perceive traditional land uses such as sporting, extensive range grazing and even sustainable forestry as necessarily detrimental to a site's wild character. However, as the authors recognized, the relative intensity of such land uses is of key importance and is directly related to their impacts on a site's wild character.

Mention is given in their preliminary review of wild land concepts to the Eastern Wilderness [Areas] Act in America in paving the way for designation of wilderness of *"previously damaged land in the more densely populated eastern USA"*. This was an important reference in the context of understanding wilderness designation. In 1964, both the Forest Service and Congress agreed that eastern areas would have qualified as wilderness (28). However, six years later, the Forest Service opposed congressional designation of new wilderness areas in West Virginia with land use histories of decades-old logging, and in 1971 they adopted a *"purity"* interpretation—that no lands with a history of human disturbance, East or West, could qualify as wilderness.

The Forest Service promoted their own bill, to establish a system of wild areas within the eastern land of the national forest system because they did not meet what they thought were the strict criteria of the Wilderness Act. As noted earlier, misconceptions often cloud the Wilderness Act, and it did so for the Forest Service. The Act states an ideal for a wilderness area, where *"the earth and its community of life are untrammelled by man"*(29). However it then defines the meaning or nature of an area of wilderness as an area retaining its primeval character, without permanent improvements, which is to be protected and managed so man's works are substantially unnoticeable. The latter is an operational definition and is forward looking rather than backward looking.

When the the Eastern Wilderness Act came to Congress, Senator Henry Jackson warned of this *"serious and fundamental misinterpretation of the Wilderness Act"* and pledged himself to correct the falsity of the so-called purity theory. Senator Frank Church, leader of the Senate debate on the Act, observed that *"the effect of such an interpretation would be to automatically disqualify almost everything, for few if any lands on this continent—or any other—have escaped man's imprint to some degree"*

The Eastern Wilderness Areas Act was signed by President Ford on 3 January 1975, and Congress designated 16 new wilderness areas totaling 206,988 acres of national forest lands east of the Rockies. The final legislation adopted some elements of the Forest Service-inspired bill, but did not alter the definition and intent of the Wilderness Act. The debate that had led up to enactment had thus led to a better understanding that the most important thing for wild land is what happens now and into the future, and not necessarily what happened in the past.

The review by McMorran and others also cited 12 *wilderness reserves* that were designated in Finland to preserve wilderness character and protect the Sámi culture, as evidence that the requirement for minimal or no human impact given in the Wilderness Act of America was not necessarily the case in Europe. These wilderness areas were designated under Finland's Wilderness Act 1991 to preserve the cultural heritage and livelihoods of the Sámi. The Sámi wilderness are vast, unsettled areas traditionally used for hunting and fishing. They are located in northernmost Finland, in the Lapland of the Sámi homelands, where reindeer husbandry, natural livelihoods of traditional subsistence use and more recently also nature tourism are practised (30).

The wilderness areas have few strictures outside of their central aim, such as requiring that forests are maintained in a natural state or operated in accordance with the principles of natural forest management (although logging is prevented in most areas); that the sale and leasing of the land and the construction of permanent roads is prohibited; as is the establishment of mines without permission from the Council of State (31)

These wilderness areas are not regarded by the Finns as true protected areas as their designation was not based on their Nature Conservation Act 1996, the principle aim of which is maintain biological diversity. Thus in the IUCN protected area management categories, the Väsäri Wilderness Area is not classified in category 1b: wilderness, but is instead classified in category VI: *Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems* ((32) and see Table 4.2). This suggests that the Sámi wilderness areas, although arising from " *wilderness*" legislation, are perhaps better described as ethnological reserves in a similar mould to the Kakadu National Park in Australia (33).

3.2.3 Public Perceptions of Wild Places and Landscapes in Scotland

In the preceding section, it was explained that during the passage of the Eastern Wilderness Areas Act, the outcome of the discussion about purity established that cultural use of lands should not be a bar on that land becoming wild again, restored to a *secondary wilderness* with functioning natural processes similar to when the land was in a primary state. In contrast, many elements of wilderness are retained in the *cultural wilderness* of the Sámi wilderness areas, because they are restricted to exploiting native resources only, rather than having a land use based on agriculture. Is secondary or cultural wilderness a recognisable characteristic of Scottish landscape?

The Cairngorms National Park (CNP) Plan identified wildness as a key quality of the National Park, and the concept was also recognised in the Cairngorms National Park Deposit Local Plan. In particular, the Park Plan included a strategic objective to *conserve and enhance the sense of wildness in the montane area and other parts of the Park*. The Park Plan also identified a number of priorities for action by 2012, which included as part of the formulation of the Landscape Management Plan, the identification of core areas of the Park where wild land experiences were especially significant, and quantification of the levels of wild land experience throughout the rest of the Park. Detractors from wild land qualities would also be identified.

To inform the development of the Cairngorms Landscape Management Plan, and other relevant policies, supplementary planning guidance and design guidance, the CNPA and SNH commissioned a program of work to investigate the public perceptions of wild places amongst a representative cross-section of Scottish residents, and a subset amongst those living within the boundaries of the Cairngorms National Park. The outputs would be used to monitor future changes in the extent to which wildness could be experienced in the CNP; to assess the impacts of proposed developments on

wild land experiences in the National Park; and to assess the extent to which wildness could be enhanced by removing key detractors in the National Park.

A market research approach was taken by contractors for the investigation of the public perceptions of wild places. The key objectives of the research were to identify (34):

- how much of Scotland is perceived to be wild, and where these wild areas are;
- what people mean / understand when they use the term 'wild';
- the importance and value people attach to the wild areas;
- the perceived threats to these wild areas; and
- how much of the National Park is perceived to be wild, and where these areas are.

Interviews were carried out across Scotland, as well as within the CNP. Baseline questions were asked about the subject's involvement with outdoor activities before moving on to questions about perceptions of wild places, reactions to photo-images, and then listing what features or characteristics reduced the wildness of an area.

The authors reported that both Scottish and CNP residents had similar perceptions of wild places and focused on the naturalness of land cover when describing wild areas, but that wildness was not limited to one type of landscape since woodlands/forests, mountains/hills, lochs and moorland were all featured highly as wild areas.

The authors had recast the results of the unprompted responses on wildland characteristics using broad brush categories supplied by SNH and CNPA. In this recasting, the category "*Naturalness of land cover*" came out first by a large margin, thus allowing the authors their claim that naturalness of land cover was significant in the description of wild areas. There has to be some doubt as to the rigour of that claim since the authors did not reveal what characteristics they had aggregated together for that category. It has to be questioned whether this really was indicative of "*naturalness*" of land cover.

It is the case that when respondents were asked to describe the features of a wild place, forests and woods were placed highly. However, as the authors note, when photos of various landscapes were shown, the image of woodland was rated less wild than other areas, for example, mountains. This is despite the fact that the woodland image shown to them of an open, native pine woodland would appear unchallenging when compared to studies in other countries that suggest that it is close-by, dense woodland that makes people feel uneasy (24). In explanation, the authors say that seeing photographs of various landscapes may have clarified respondent's choices, or that the particular photograph did not match their perception of woods. The latter may be the case since the openness of the woodland in the photographic image could have suggested that subjects were viewing a parkland landscape.

The authors missed commenting on one other conspicuous difference in responses for the characteristics of wild places between unprompted and prompted responses, where lochs and particularly rivers shot up in popularity if these were given as examples in the prompted question. Again studies from other countries have shown water to be a key feature of wild landscapes (35). The difference may be a methodological issue, but it is surprising then, that when using the photographic images the authors confused the issue further by showing an image that combined a loch with a mountain, and there are no images of moving water (rivers or waterfalls), whether in *natural* settings or not.

Another area where the authors offered no analysis was that respondents appeared to have associated exclusively the animal kingdom with their perception of "*wildlife*", so this was given as a

separate category to forests/woods/trees. It was not explored whether vegetation - woodland, trees, wildflowers etc - were regarded as wildlife as well (see later).

The report noted that the key threats and detractors from wild places tended to be identified by respondents as modern and human interference, such as modern buildings or masts, rather than old buildings or low impact changes such as forestry plantations or footpaths. The most frequently requested action to preserve wild areas was to introduce more stringent planning control for buildings, followed by more control for masts, wind turbines and vehicle tracks. CNP residents were more likely to call for more stringent planning control for masts and wind turbines.

It is likely that the general public is mostly unaware of the modifying impact that land uses such as agriculture have had on landscapes. This was to some extent confirmed by the response to the question about what features or characteristics that reduce the wildness of an area. In both unprompted and prompted situations, the presence of farm animals was rated very low as a detractor, as was plantation forest. Surprisingly, also, fencing came out low in both cases.

When respondents were shown a map of Scotland and asked to identify the sections perceived as having a great number of wild areas, many places were given, especially Highland North, Highland West, Highland East, the Western Isles and the Northern Isles. The Clyde Valley was stated most frequently by both audiences as the area with little or no wild areas. Respondents were then asked to give the specific areas of Scotland that they perceived as extremely wild. A vast range of different places were mentioned, with one in four of the general population stating that the '*Highlands*' was extremely wild, followed by a similar list as above. Scottish residents saw more areas as wild than residents of CNP. The perceived wildness of the CNP came out high with both groups, but with a significantly greater proportion of CNP residents responding that it was either very or quite wild than the general population.

In what could have been a key element of the study, respondents were shown a list of areas of different landscape types within the CNP and asked to rank the areas in terms of wildness. These were mountain tops, heather moorland, natural moorland, forestry plantation, farmland and villages. The authors admitted that the category natural moorland was an error in the questionnaire that should have read '*Natural Woodland*'. While they say this error did not affect the ranking of the other landscape types, it did of course negate the worth of the exercise.

These criticisms of the perceptions study were mirrored in the report of a second, linked, element of the work program commissioned by CNP and SNH, on the development of a method for a Geographic Information System (GIS) based analysis of wildness, and use of that method to identify the geographical extent and intensity to which different wildness qualities or attributes can be experienced across the CNP (36). The criticisms of the authors of the second report were primarily in relation to value of its findings to inform the follow-on spatial study, concluding that much of the specific data in the survey results was found to be of little practical use.

Specifically, they commented that many of the questions were poorly specified in relation to the spatial aspects of the current project; the images used for ratings of wild images in the perception survey heavily steered the respondent with the presence of livestock and people, thus ignoring established methods for statistically analysing public perceptions of landscapes; and the questions used to parameterise public rating of the impact of features on wild places were poorly constructed. They were concerned that many of the results of the perception survey were contradictory, making it difficult to identify a consistent voice. Notably, some results indicated that certain features were important contributors to wildness, whilst others did not and emphasised different landscape features as being important.

The headline finding of the perception study that is given currency in Scotland is that there was strong support for the conservation of wild land, that 91% amongst Scottish residents thought that it was important for Scotland to have wild places (37). While this finding of the report cannot be faulted – it was a direct question - the rest of the findings have done little to elucidate in greater detail what was considered were the specific characteristics of those wild places, and especially what biophysical content of landscapes made them wild. It has to be concluded that this study made little advance over that of Habron (see earlier).

In an informal test of the perceived attributes of wildland, six different groups of wildland experts attending the conference on *“Scotland’s wild landscapes: new ways forward”* held at Battleby, near Perth on 13-14th May 2010, were given eight maps of Scotland on which were mapped different potential attributes of wildland. They were asked to make a selection of between three and five attributes from the group of eight (including remoteness, road density, ruggedness, population density, distance from nearest settlement, altitude, naturalness of land cover and absence of modern human artefacts) that best described wildland and then weight these according to their relative importance. While the six groups all chose different sets of attributes and applied different weighting schemes, the maps produced were basically similar in terms of the spatial distribution of wildland, but different in the local detail. The attribute maps are given in Annex 2, and a comparison between two example maps derived from the choices of the groups is shown in Fig. A2.8 in Annex 2.

A simple difference map showing the range of wildness values from all six maps shows a high degree of agreement between all maps as to where the core wildland areas are located, and as to where the non-wildland areas are. The main differences lie in the boundaries between wild and non-wild. This serves to underline the importance of the need for a rigorous spatial definition of wildland based on wide ranging opinion surveys underpinned by a clear understanding of the wildland concept in relation to Scotland’s landscapes. This difference map is shown in Fig. A2.9 in Annex 2.

It has to be concluded that an exemplary study of the perceptions, and reality, of wild land in Scotland remains to be undertaken. In guiding that work, Liley and others (38) and Pheasant and others (39) have published recent studies of landscape perception that made very good use of photographic and video images. In addition, this should be combined with a rigorous and definitive public opinion survey that is spatially grounded, along the lines of the informal test described above.

3.3 Wildness and nature conservation contrasted between Britain, Canada, and America

An uncommon opportunity was provided in an article by Norman Henderson to look at wildland and nature conservation in Britain through the eyes of someone with experience of the American and Canadian situation. Dr Henderson, a Canadian, is Executive Director of the Prairie Adaptation Research Collaborative at the University of Regina, Saskatchewan (40). However, in the 90s, he lectured in environmental economics at the University of East Anglia in the Centre for Social and Economic Research on the Global Environment (CSERGE). While there, he wrote a discussion paper for the Centre’s series on global environmental change issues in which he contrasted nature conservation in Britain, Canada and America.

The discussion paper was subsequently published in *Ambio* and it revealed striking differences in conservation purpose, and in interpretation of what is natural (41). In Britain he believed, diversity, historicism, and a concern for favoured species had been the driving forces behind a conservation ethic dominated by environmental manipulation:

“The British concept of the conservation ideal is a steady state of human intervention designed to maintain a given habitat at a particular successional stage in perpetuity”

Concern for conservation in North America usually expressed itself instead in exhortations not to interfere with natural processes, often symbolised by wilderness.

Henderson believed that although *"Wilderness"* was difficult to define precisely, it was commonly regarded to be a place where natural processes governed environmental change and man was at most a spectator or visitor. Wilderness was thus visualized in opposition to civilization, as an antithesis but, when viewed positively, as a compliment to the physical and social structures of man. He saw a continuum with wilderness and civilization as opposing endpoints. The idea of a continuum for wildland is explored later in this Chapter (see section 3.4).

While he thought it perfectly possible to quantify the wilderness content of a given landscape according to set criteria, in practice he recognised that an individuals' judgments were partially subjective, dependent on cultural background and previous experience, and variable over space and time. Thus what seemed to be untouched wilderness to one person may be perceived as tame civilization by another, as Nash (42) states: *"One man's wilderness may be another's roadside picnic ground"*. In particular, he pointed to local residents who were familiar with their home environment and would be less likely to perceive it as wilderness than distant outsiders who may perceive the same environment to be exotically wild.

When considering the role and value of wilderness, Henderson thought it difficult to demonstrate that wilderness was a necessary component in the full health of an individual or nation. However, if that could not be demonstrated, it could instead be reasonably postulated that some proper balance of civilization and wilderness was desirable. Thus he opined that many American conservationists would be disappointed to see that people in Britain seemed not to suffer any serious signs of wilderness deprivation. *"If they are deprived, they are certainly not concerned about it"*

This then was the core difference in attitude that he identified between Britain, Canada and the United States. Wilderness had not recently existed in Britain and therefore had not been a domestic ideological factor. On the other hand, wilderness had been perceived as threatened and valuable by an increasing number of people in the United States since the 1890s, whereas wilderness had been perceived as superabundant until recently in Canada.

Henderson took a quote from the American Conservation Foundation that reflected on the works of the great wilderness advocates Muir, Olmstead and Leopold, and which was a caution about the historical loss of wildness:

"The most frightening vision these writers conjured up was the prospect that, because these special places [wilderness and natural areas] influence us in ways we don't even fully understand, their disappearance might even cause future generations to lose the capacity even to know what they are missing"

Henderson argued that this was the situation in Britain, that we may increasingly not know what we are missing.

It bears repeating that Henderson regarded the *"British compulsion"* to intervention management, *"complete with justifications"*, as anathema to Canada or America. It went to what he diagnosed as the dissonance between that management approach and the wildness of land. He remarked that:

"as the natural world is nothing if not dynamic, the British predilection to maintain environments in a steady state could legitimately be viewed as the most unnatural conservation policy possible"

He also believed that the British injected confusion into conservation issues by pretending that certain manmade features in the landscape (those aesthetically in favour) were somehow "*natural*" in order to legitimise their protection. He thought those favoured features may be field hedges or sheep, or inorganic and completely unnatural elements such as stone barns and walls. He warned that it was only a small step from that to the widely held view that farmers themselves are "*natural*" elements of the landscape. Thus he considered that the term "*natural*" in Britain was applied to whatever object, species, or landscape the speaker favoured, often with reference to a particular point in time. That farm animals, plantation forest and fencing rated very low as detractors of wildland in the perception study in the previous section, tends to add confirmation of this view (see section 3.2.3.)

Henderson finished by observing that voices of dissent from the consensus in Britain on nature management were rare, and that the propriety of nature conservation by manipulation was not questioned. While his point of view of the British approach to nature conservation was challenging, this should not obscure his equally important message, that an experience of wildland in Britain was only as good as the wildland itself – in Britain, we risk being content about our experience of wildland, but in the absence of any informing contrast.

This begs the question of what we measure when we set ourselves the task of understanding our perceptions of wildland, and whether we are sufficiently aware of what we see. If we want a more authentic eye to understanding wildness, then it could be argued that the first thing to do is to identify the correct range of settings. That this is the case, even in America, was shown in a study by examining the qualitative aspects of the wilderness experience as a source of spiritual inspiration. The study was based on the recreational trips into wilderness of two groups of women, and their wilderness experiences gauged from on-site observations, personal field journals, and in-depth interviews. For some women the importance of being in an all-women group appeared to be slightly more important than being in a beautiful physical setting, whereas for others it was the positive social dynamics that had occurred between the various participants (43)

"However, when asked to describe their wilderness experience in greater detail, it became apparent that certain biophysical elements of each specific site had in fact contributed greatly to their experience overall. In addition, it appeared that it was the biophysical attributes that rendered each site as spiritually inspirational, and presupposed a more contemplative and self-reflective interpretation of the trip experience overall. One of the themes that consistently arose in the individual interviews was the importance of being in a bona fide wilderness area; in other words, that the trip itself had taken place in a pristine setting, away from the trappings of modern civilization"

3.4 Wildland defined In Europe

A briefing note on the definition and background of wilderness and large natural habitat areas was prepared for the EU Conference in Prague in 2009 (44) and was substantially reproduced in the Conference proceedings (45). One of the main reasons for the absence of a coordinated strategy on wilderness and large natural habitat areas in Europe was identified as the lack of a common working definition. Equally, if inappropriate definitions are employed, this can itself create an obstacle to achieving conservation objectives.

In tracing the origins of our awareness of wilderness, it was recognised in the note that our hunter-gatherer ancestors in Europe probably had no concept of wilderness since that was what surrounded them and sustained them (and see section 3.1). Awareness of wilderness must therefore have begun in Neolithic times when people started to transform some of their natural surroundings into fields

and pastures for domesticated plants and animals, and so the cultivated environment started to differ from wild nature.

Kat Anderson characterised this ecosystem change for North America in terms of the impact of the different rates of disturbance before and after the arrival of modern humans (the Native Americans) and with the arrival of settlers from Europe (46). In her timeline, the rate of disturbance was unchanged before the arrival of people. This represented the original ecosystem (the wilderness) in the absence of indigenous natural disturbance (e.g. through wildfire). The trajectory of disturbance increases after the arrival of modern humans, representing a period of indigenous alteration of ecosystems through hunting and gathering (see section 3.1.1) However, the trajectory takes another upward turn with the arrival of Europeans and their agriculture.

That the rate of change in disturbance was indicated to increase with both arrivals fits with the observation that human use of landscapes tends always to an upward trend of development, whether based on nurturing native resources, or agriculture with its development of crops and livestock. But it was the difference postulated between trajectories that Anderson highlighted in her support for the benign influence of Native American culture on the landscape.

In Europe, the culture of agriculture has predominantly superseded an indigenous culture, and the briefing noted that there were few, mostly unmodified parts of Europe where large truly wild or '*wilderness*' areas could currently be found. The judgment was that it was only in parts of Finland, Sweden, Norway, Ukraine and Western Russia together with bordering states, plus smaller more fragmented elements in Central and Southern Europe.

It was concluded that a practical definition of wilderness in Europe needed to be developed that involved a consideration of scale, landscape impact, prevalence of natural process, relative lack of intervention management, and ability to deliver significant ecological services as well as host a range of wild land related recreational and social activities. It would be further determined by subjective opinion: the spirit of wild land that enables solitude, sense of wholeness, belonging, healing, awareness and self-development. Thus a large area of terrestrial (or marine) natural habitat and ecological processes mostly unaltered by the hand of man could be considered as wilderness. In contrast, '*wild areas*' or wildland were smaller and often fragmented areas, where the condition of natural habitat and relevant species was either partially or substantially modified.

The desirability was recognised for this wildland to progress over time through increased stages of naturalness – via restoration of habitat, wildlife and natural processes - and towards natural instead of built infrastructure, indicating that the attainment of "*wilderness*" status could be the ultimate goal in this process wherever scale, biodiversity needs and geography permitted. Wilderness could thus be measured along a '*continuum*' with marginal farmland and forestry at one end and wilderness at the other.

The wildland continuum is a very important concept, as it is also a tangible reality. The latter was recognised in the study that developed a typology of wildland in Scotland where a number of respondents had noted that wilderness varied considerably across their sites (see section 3.2.2) as well as in the spatial study of wilderness across the Cairngorms National Park (see section 3.2.3). A representation of this continuum can be seen in the Model of Conservation Grazing Options, developed by the Grazing Advice Partnership (47), and which is shown in Fig. 3.2. The trend from the left is an increasing intensity of land use, along which is placed a range of land activities. Non-intervention woodland with only wild herbivores is placed at the left end of the continuum, and could be taken as a metaphor for wilderness in Britain. Activities with increasing interventional pressure are shown ranged along the continuum.

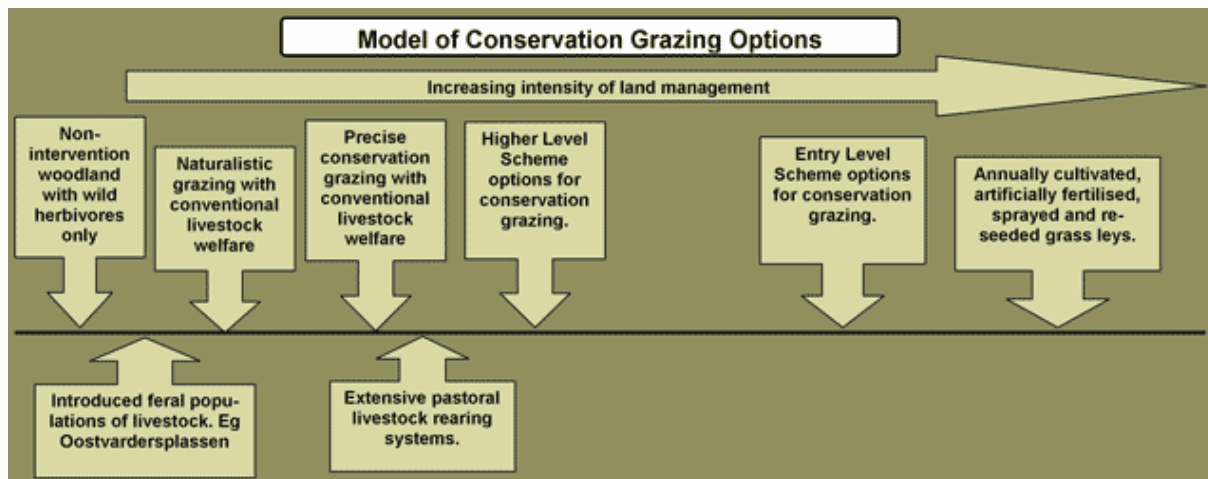


Figure 3.2 Conservation grazing options and intensity of land use (from the Grazing Advice Partnership (47))

The continuum has recognition in the IUCN categories for protected areas (48). Thus Figure 3.3 shows a trend line of increasing degree of environmental modification against decreasing naturalness. The categories are plotted along that trend line, based on an approximation of the naturalness of each category. Category Ia, 'strict nature reserve' and category Ib 'wilderness' are classified on the basis of containing intact and functioning natural habitats and processes, and are thus seen towards the high end of naturalness.

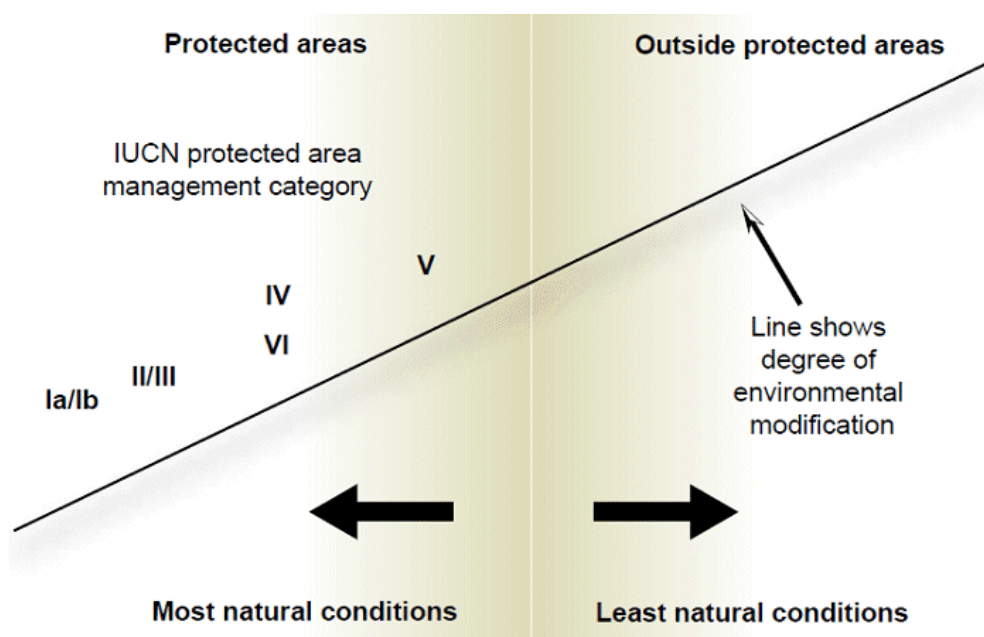


Figure 3.3 Naturalness and the IUCN categories (Fig. 1 in (48))

While the IUCN Guidelines say the categories do not necessarily imply a hierarchy, they advocate that a well balanced protected area system should consider using all the categories. On the same basis, it can be argued that a balance in our landscapes would be for wild areas to exist within all possibilities of the continuum, and not just at one point.

Zoning was advanced in the study that developed a typology of wildland in Scotland to differentiate between different categories of wild landscape along the continuum that existed across a site (see section 3.2.2). The briefing note also covered zoning as a means to assist in the expression of 'wildness' and address the issue of spatial development over time. Thus identification of core, buffer and transition areas could be identified, each with different types and levels of intervention. The inner "core zone" would have no extractive activity, the "buffer zone" around the core would have low impact activities only, and the "transition zone", outside the buffer zone, would have an emphasis on maintaining a stable landscape. This is the zoning pattern for Biosphere Reserves (see section 8.4.1). As will be shown in Chapter 6, the implementation of national protected areas systems in Europe based on the IUCN categories, draws heavily on the use of zoning.

3.5 Summary

Throughout this chapter, a recurring pattern has emerged, that the main attributes of wilder areas are where there is a lack of obvious human management or intensive productive use. This could be thought to hark back to an era when the human presence was considerably less pervasive, and thus a range of other forces – commonly entitled "natural forces" – were dominant in shaping the land. The fact that an imprecision is revealed as to what wildland means is due to the range of degree of human influence that can be seen today, and the lack of a clear context in which to view it.

A simple explanation of that context would be as follows:

- agricultural landscapes are those that have been completely arranged by human activity, with very few of the structural components of the natural vegetation, but often with non-native components that have been introduced. What natural elements are still present in an agricultural landscape only persist if they contribute to or do not hinder extractive use. These are the landscapes that have the least degree of naturalness.
- semi-natural landscapes are those that have been modified by human activity, but which have some natural elements left intact and are not cluttered by human physical development. These are described as "wildlands" by those making a comparison with the entirely agricultural landscapes of improved grassland or the bare soil of arable fields. However, there is still agricultural use or land management activity in these "wildlands", and thus they can be described as semi-agricultural instead of semi-natural, since the modifying activity of agriculture has been, and still is the greater influence on the land than natural forces
- natural (near-natural) landscapes are those with a completeness of the native biophysical elements characteristic of the natural forces prevailing, as well as the geomorphological properties of the location such as water, geology, and land form. While an experience of these natural landscapes is important for what is there, it is also what is not there that is just as important. Thus a natural landscape is one that appears to be unaffected by human activity – it has none of our cultural artefacts (buildings, roads and boundaries) and it is in the control of natural processes that are beyond our cultural influence.

In Habron's perception study using photographic views in the Cairngorms and Wester Ross, he asked his subjects to rate the wildness of the images taking into account the amount of human influence in the scene. It is thus not surprising that he concluded from his own inspection of the photographs that the ratings were higher where there was less evidence of human artefacts and influence. His study set out with the presumption that there was very little, if any, wildland in Scotland in terms of natural (near-natural) landscapes. It is likely therefore that he did not seek out photographic views that could reflect such landscapes, and thus his perception study would only have been able to discriminate between agricultural and semi-natural landscapes.

The study by McMorran's group in developing a typology for wildland in Scotland recognised that the relative intensity of land use was of key importance and was directly related to the impacts on a site's wild character. They noted that wildness can be experienced in a variety of settings, but that definition of the resource itself was central to the wild landscapes agenda in Scotland, with the need being for the development of detailed criteria for wild landscapes in planning and policy guidelines. This was also the case for a statutory definition of core wild landscapes so that they can be spatially located.

There was much to criticise in the study Public Perceptions of Wild Places and Landscapes in Scotland undertaken for CNP and SNH. In the same way as the Habron study, but with far less stringency, it would only have been able to discriminate between agricultural and semi-natural landscapes. In light of that, and from the observations of the McMorran group, it has to be concluded that there is a need for an exemplary study of the perceptions and reality of wild land in Scotland, and with a rigorous and definitive public opinion survey that is spatially grounded.

The backdrop to this exemplary study has to be a recognition of the context given above, and it is most easily understood in terms of the wildland continuum described in the previous section. Thus agricultural, semi-natural and natural (near-natural) landscapes all appear at different parts of the continuum, and a relationship is established between them as well as a link between cause and effect (outcome). There will be places in Scotland that are outside of human extractive use, or where ecological restoration is taking place through exclusion of livestock grazing and either natural or assisted regeneration of native vegetation, and so it is likely there is a "*completeness*" of locations along the continuum on which to base the study. In that way, while there may not be the range of continuum that Henderson envisaged – between civilisation and wilderness – there will be an opportunity for a greater discrimination along the continuum than there has been to date.

CHAPTER 4: SCOTLAND AND WILDLAND

4.1 Origins and events - the right to roam

It is perhaps impossible to be precise about the genesis of wildland appreciation in the history of Scotland. It could be argued that the Scottish view of wildland is bound up with the wide-spread belief in the existence of a general public right of access to land in Scotland. This belief is said to have been deep seated and widely held, especially in the Highlands, as part of an ancient tradition of the right to universal access to the land, and yet it is said that it is hard to find a strict basis in law (1). In the late nineteenth and early twentieth century, it was perhaps almost an article of faith among many hill walkers and ramblers that there was a "*common law*" right to roam, but this likely trespass relied on the goodwill of landowners (2).

There are some longstanding public rights to the "*foreshore*" in Scotland, as the land between the high and low watermarks. *Commonities*(commons) also provided areas of free access, whether for comings and goings, markets and fairs or other events (3), and this may be the precedent for the contemporary definition of a right of way in Scotland, that (4):

"To become a right of way, a route has to meet certain legal conditions; in particular, it must have been used by the general public for at least 20 years and must link two public places (usually public roads). Rights of way vary from long hill routes (often historical drove or kirk roads) to local routes used for walking the dog or as short cuts to shops, schools and other local amenities"

It was perhaps the formation of the two mountaineering clubs in Scotland in the late nineteenth century, and their long records of publishing descriptions in their journals of the mountains and crags of Scotland, their exploits in climbing them, and of their hill walking (5, 6) that may have helped encourage legislators to consider an access bill.

James Bryce MP introduced the first bill for freedom to roam in 1890. The Access to Mountains Bill sought "*to secure to the public the right of Access to Mountains and Moorlands in Scotland*"(7). This failed, as did three other attempts before a private members bill from Arthur Creech Jones MP was successful in 1939 (8). The bill was opposed by those with landed interest, this from a speech in the Lords by the Earl of Weymiss (9):

"One measure which was to have come before the other House of Parliament, and which may, perhaps, some day reach your Lordships' House, is called the Access to Mountains Bill, which will empower people to go for scientific or artistic purposes everywhere except where there may be enclosures or plantations. That is really a measure to permit the public, generally to roam at large. I am speaking in the presence of Scotchmen and Yorkshiremen who know what moors are, and I venture to say that, in regard to property, the value of the grouse on Scotch moors is probably equal to that of the sheep on them. Thus, this proposal might destroy much valuable property. If the Bill ever comes before your Lordships, I hope you will take care not to permit people to travel freely over moors, and destroy the grouse in the nesting season. The grouse and deer are about the most valuable properties our mountains produce"

In more recent times, the Countryside (Scotland) Act 1967 had provisions for access to open country, subject to access agreements being negotiated. Open country was defined to consist of (10):

"wholly or predominantly of mountain, moor, heath, hill, woodland, cliff or foreshore, and any waterway; and in this section "waterway" and "foreshore" shall include any bank, barrier, dune, beach, flat or other land adjacent to the waterway or foreshore"

The effect of those provisions was to remove the liability for trespass from people entering upon land without causing damage for the purpose of "*open-air recreation*".

The latter Act was superseded by the Land Reform (Scotland) Act 2003 (11) that established rights to be on land for recreational, educational and some commercial purposes, and a right to cross land. The rights exist only if they are exercised responsibly. The Act tasked Scottish Natural Heritage to draw up and issue the Scottish Outdoor Access Code as guidance to responsible access when engaging in such activities as climbing, caving, camping, canoeing, swimming, walking, rambling and mountaineering (12).

This brought Scotland into line with the Nordic countries and "*everyman's right*" to outdoor public access. The traditional Finnish legal concept of everyman's right allows free right of access to the land and waterways, and the right to collect natural products such as wild berries and mushrooms, no matter who owns the land (13). Right of Public Access is guaranteed in Sweden's Constitution, it is not enshrined in law and there is no statute that exactly defines its scope, but it is hedged around by various laws that set limits to what is allowed (14). You are free to pick flowers, berries and mushrooms in the countryside. In Norway, the right is based on the Outdoor Recreation Act. 1957 (15). It gives the right to free access on foot and on skis, and to some extent, by horse. It also allows for camping, and the harvesting of berries and mushrooms.

4.2 Land in beneficial ownership

Rights of access can, of course, be secured by ownership, and thus it is important to see how land in Scotland that was of wildland value came into a form of ownership in the twentieth century that could transfer those rights to the general public. The Association for the Preservation (Protection) of Rural Scotland (APRS) was founded in 1926 to protect the landscape and the amenity of the Scottish countryside, and is ostensibly Scotland's first environmental organisation (16). The Association was offered the Loch Dee estate near Newton Stewart in Galloway, but it did not have the power to hold land (17). The National Trust, established in London in 1895, had powers to hold land throughout the British Isles. However, in discussions held between the APRS and the National Trust, it was felt that Scotland should have its own body to hold land for the public good. This led to the formation of the National Trust for Scotland (NTS) in 1931. The NTS's first land holding came in 1932 with a bequest of 569 ha of land at the Burg, a remote headland on the western side of the Isle of Mull.

Percy Unna, a keen mountaineer and President of the Scottish Mountaineering Club in the mid-1930s, was the driving force behind the next major land acquisitions of the NTS (18, 19). Unna's mountaineering experience engendered in him the enthusiasm to protect the natural landscapes of Scotland. He set about raising funds through donations from the Scottish Mountaineering Club, following an appeal to its members, and from other mountaineering clubs across Britain, to purchase much of the Glencoe Estate of Lord Strathcona, starting with Clachaig, Achtriochtan and Strone in 1936, and followed by a part of Dalness in 1937, which included the whole of the south side of Glencoe east to the mountains of Buachaille Etive Beag and Buachaille Etive Mor. He contributed generously (and anonymously) to the purchases from his own funds and presented the properties to the NTS.

Following the purchase of Glencoe and Dalness, Unna set down principles in 1937 in a letter to the NTS for the running of mountainous property, which he believed would be wished for by the members of the SMC (20). Based on his wide experience of the "*taming*" of mountains across Europe, for instance through the construction of cable-cars, funicular railways, and mountain-top restaurants, Unna recognised the value of Scotland's undeveloped mountains. In handing over the mountains to the care of the Trust, his over-arching principle was that there should be unrestricted

access at all times and that the land be maintained in its primitive condition for all time. In promoting the preservation of this "*primitive*" quality, Unna said that the mountains should not be made more easily accessible, or easier to climb. He also precluded the building of facilities for lodging, shelter or food accommodation other than on the peripheries of the estates, or the construction of new footpaths (although repair of existing ones was allowed) and that there should be no directional or other signs, paint marks or cairns introduced.

This era set down two very important markers for the future of wildland in Scotland, as recognised by Croft (17) that perhaps bear some contemporary review and reflection. The Unna letter established for the first time in Scotland the principles of managing mountainous country for conservation. The detail in the principles is what acts as a guide to the NTS to this day, but it is surprising that it has not found its way into any national protected area legislation in the UK, as similar principles have been encoded in the legislation of many other mountainous countries in Europe.

The acquisition of the Glencoe and Dalness estate set the NTS on a pattern of ownership of land of high landscape and nature conservation interests, and one that has been reflected by other conservation landowners in Scotland since then. The Trust's Executive Committee at the time saw the estates as being ideal for their *'magnificent and representative scenery, worthy of being a National Forest Park, as well as providing ready access from the cities of the central belt'*

This view thus predates the legislation that eventually defined the characteristics of National Parks in Britain, first in England and Wales (National Parks and Access to the Countryside Act of 1949) and then in Scotland (National Parks (Scotland) Act 2000). These Acts, however, did not reflect what were the virtuous lessons that could have been learnt from those early land acquisitions by the NTS.

Those acquisitions established the principle of the purchase by a voluntary charitable body of land of national importance for, in the words of the Trust's enabling legislation, *'the benefit of the nation'*. Today, we would characterise that as land in "*beneficial ownership*", and thus not necessarily tied wholly to a need for an income from extractive activity that would threaten its wild nature. This is the situation for the National Parks system across Europe, where it is the primary basis for their establishment (see Chapter 5).

In addition, the purchases were funded to a large extent by voluntary donations. The significance of this was the willingness of individuals who cared for the mountains as places of recreational and landscape value to give freely to protect them for the future. It is a short step from there, for there to be a will for public ownership of land of high landscape and nature conservation interest, as there is in the publicly-owned National Parks across Europe (see Chapter 6).

4.3 A contemporary figure - Frank Fraser Darling

Before moving on to consider contemporary references to wildland, mention should be given of Frank Fraser Darling. It is said that his work in the hills for a PhD at Edinburgh during the early 1930s on fleece development in Blackface sheep, instilled a love of wild places, especially the Highlands and Islands. He later won a small fellowship to study red deer in Wester Ross, and in 1937 his book *A Herd of Red Deer* was published. Moving to Priest Island off Wester Ross, he studied the social behaviour of gulls. He also began to develop his ideas on how derelict farm land in the West Highlands could be brought back into production (21).

In 1947, he completed the Collins New Naturalist volume *Natural History of the Highlands and Islands* and he was invited to direct *The West Highland Survey*. He saw that detailed report as *'an essay in human ecology'* (22) but the independent and unorthodox opinions he expressed were not

well received. At a time when government wanted to maximise production, Darling saw that the Highlands and Islands were *"a devastated landscape"*, and that there was an urgent need for restoration before humans could sustainably use the land, a theme he would often return to during later work in North America, Mexico, and Africa.

The unpalatable message of *"a devastated landscape"* - and of a *"wet desert"*, another description of Scotland ascribed to Darling - are often taken issue with. That there has been a much richer ecosystem in Scotland is beyond dispute when set against the range of extinctions that are only now being redressed through the reinstatement of such as the sea eagle (23) and beaver (24). Darling foresaw that need in *Wilderness and Plenty*, his Reith lecture series in 1969, when as well as protecting what was left of the world's relatively untouched areas, he said there was a need for the rehabilitation of the existing degraded environments in which so many people live (25). He was talking about wilderness by then, recognising the reality that *"Most people will never know true wilderness although its existence will not be a matter of indifference to them"*

His sense of what those wilderness environments could bring was evidenced by his acceptance that it was a moral obligation to *"ease out the living space and replace dereliction with beauty"*

While in Alaska in 1952, Darling worked with Starker Leopold in undertaking an ecological reconnaissance to assess the then current and potential impact of economic growth and technology on the natural resources of that territory (26). Starker was the son of Aldo Leopold, the latter considered by many as the father of wildlife management and of the United States' wilderness system (27). The influence of the Leopolds – father and son - on Darling, and that of the landscapes in which they traveled, can be seen in the vision of wilderness in this paragraph from the Reith lectures, which is certainly worthy of the father himself:

"The ecologist sees the decline of the great natural buffer of wilderness as an element of our danger. Natural wilderness is a factor for world stability, not some remote place inimical to the human being. It is strange that it has been so long a place of fear to many men and something to hate and destroy. Wilderness is not remote or indifferent, but an active agent in maintaining a habitable world, though the cooperation is unconscious"

4.4 Contemporary references to wildland

Wild land has increasingly been referred to in land use and planning policy in Scotland, as well as in the policy statements of statutory and voluntary organizations.

4.4.1 Planning and Policy - Scottish Government and SNH

National Planning Policy Guideline (NPPG) 14: Natural Heritage from 1998 is recognized as a significant early reference because it contained a definition for wildland (28):

"Wild Land: uninhabited and often relatively inaccessible countryside where the influence of human activity on the character and quality of the environment has been minimal"

The guidance explained that Scotland was fortunate in having a rich diversity of landscapes. Thus many areas, for example in the Highlands and Islands, possess mountain and coastal landscapes which were valued nationally and internationally for their quality, extensiveness and wild land character. It went on:

"Some of Scotland's remoter mountain and coastal areas possess an elemental quality from which many people derive psychological and spiritual benefits. Such areas are very sensitive to any form of development or intrusive human activity and planning authorities should take great care to safeguard their wild land character. This care should extend to the assessment"

of proposals for development out with these areas which might adversely affect their wild land character"

The second National Planning Framework (NPF) for Scotland was published in June 2009, and contains a strategy for the long-term development of Scotland's towns, cities and countryside over the next 20 to 25 years. The importance of wild land was recognized in paragraph 99 (29):

"Some of Scotland's remoter mountain and coastal areas possess an elemental quality from which many people derive psychological and spiritual benefits. Such areas are very sensitive to any form of development or intrusive human activity and great care should be taken to safeguard their wild land character"

Over recent years, the replacement of NPPG 14 with a putative Scottish Planning Policy 14 was discussed by the Scottish Landscape Forum, but in the end NPPG 14 was superseded by being subsumed in February 2010 within a document entitled *Scottish Planning Policy*, an overall statement of the Scottish Government's policy on nationally important land use planning matters (30). The definition of wild land was lost to this new document, but the need to safeguard areas of wildland character from development was still there:

"The most sensitive landscapes may have little or no capacity to accept new development. Areas of wild land character in some of Scotland's remoter upland, mountain and coastal areas are very sensitive to any form of development or intrusive human activity and planning authorities should safeguard the character of these areas in the development plan"

Woodland habitat is often recognised as a significant attribute of wild land character (31, 32). It probably stems from a primeval instinct since the UK Biodiversity Action Plan states that (33):

"The natural climax vegetation (the plant communities which would develop and be present in the absence of human intervention) over much of the UK is broadleaved forest, dominated by trees such as oak, ash and small-leaved lime..... The natural forests have been termed wildwood and some of our woods are probably derived directly from these forests, with a continuity of woodland vegetation present..... Woodland is termed ancient if it has been continually present since before 1600"

The statement on planning policy in the document *Scottish Planning Policy* firmed up on the importance and protection of ancient and semi-natural woodland, and other native and long established woodlands with high nature conservation value. The policy asks that these be identified in development plans along with relevant policies for its protection and enhancement. Planning authorities were also advised to consider preparing woodland strategies as supplementary guidance to inform the future development of woodland and forestry in their area.

Six years ago, Forestry Commission Scotland initiated a survey to create the first full record of Scotland's remaining native woodlands. Previous surveys had focussed on regions of Scotland, specific types of woodland, or woodlands at a larger scale, thus excluding some small but important native woodland habitats. The Native Woodland Survey of Scotland (NWSS) was carried out with the support of SNH, and aims to detail the extent, nature and condition of the native woodlands in all of Scotland's local authority areas. The first eight summary reports were recently published, covering the local authority areas for Edinburgh, Glasgow, Aberdeen, Dundee, North, South and East Ayrshire and East Renfrew. The survey data is available online to enable woodland owners and managers, partner agencies and local authorities, to inform their woodland management, planning and decision making processes (34).

The SNH policy statement *Wildness in Scotland's Countryside*, published in 2002, provided support to the policy approach that was taken in NPPG14, and thus also to its replacement in Scottish Planning Policy (35). SNH believe that wildness is a quality experienced by people when visiting places of a certain character. They expect wildness to be found along a spectrum (a continuum? – see section

3.4) from places where this quality has only limited expression to others where wildness is a dominant element of the visitor's experience of the landscape. Thus, a degree of wildness can be experienced in many settings across Scotland's countryside. However, they believe the term wild land should only be used where wildness is found to be a dominant element of the landscape character of an area.

The physical attributes that SNH contend contribute to the experience of wildness and thus define wild land are as follows:

- a high degree of perceived naturalness in the setting, especially in its vegetation cover and wildlife, and in the natural processes affecting the land;
- the lack of any modern artefacts or structures;
- little evidence of contemporary human uses of the land;
- landform which is rugged, or otherwise physically challenging; and
- remoteness and/or inaccessibility.

These physical attributes evoke perceptual responses, amongst which are:

- a sense of sanctuary or solitude;
- risk or, for some visitors, a sense of awe or anxiety, depending on the individual's emotional response to the setting;
- perceptions that the landscape has arresting or inspiring qualities; and
- fulfilment from the physical challenge required to penetrate into these places.

SNH provided a map of *Search areas for wildland* to accompany the policy statement, the search areas identified where the main wild land resource was most likely to be found - those now limited areas of mountain, moorland and remote coast, which mostly lie beyond contemporary human artefacts such as roads or other development (36). It is those search areas that have until recently been used to identify wildland in deliberations of the development process, but without seemingly being a significant enough factor to prevent development (see Gordonbush Windfarm in (37)). However, SNH recognise that the search areas do not delimit wild land, and thus confirming the presence and extent of a wild land area is therefore required. They have recently added guidance on wildland and development in response to the recognition that most of the focus of renewable energy regeneration in Scotland since 2002 had been on wind energy.

The guidance on *Assessing the impacts on wildland* is however not only about development of wind turbines, but also of other infrastructure developments, tourism and recreation facilities, forestry, agriculture and sporting land uses (38). The guidance sets out general principles for assessing the potential adverse impacts on areas where wildness is best expressed (wild land), including an assessment methodology.

The first stage of the methodology is to establish a baseline for assessment by exploring and describing the extent to which physical and perceptual attributes of wild land are present, and by identifying and describing the character, sensitivity and condition of the area that could be affected, and its contribution to the wild land area as a whole. The physical and perceptual attributes of wild land used within the methodology are those described in the policy statement on Wildness in Scotland's Countryside (see above).

Last year, SNH completed a survey of all the National Scenic Areas in Scotland, producing a list of the landscape qualities for each one. A standard method was used, based on fieldwork and recording observations on separate field sheets of an objective analysis of characteristics, visual experience and emotional response. As a guide to filling in Field sheet 3 - Personal Response to the Landscape, the following explanation was given (39)

“A subjective description of your personal response to, and feelings about the scene. Note any contrasting feelings relating to different parts of the scene, if applicable. (e.g. exhilarating, inspiring, exciting, awesome, challenging, surprising, spectacular, dramatic, turbulent, unsettling, uncomfortable, wild, remote, isolated, undiscovered, secret, mysterious, tranquil, peaceful, hidden, idyllic, contrasting, harmonious, unified, refreshing, reassuring, comforting; time-depth, sense of history). Imagine how the scene may change at different times of the year, or in different weather conditions”

It has to be concluded that although wildland may be embedded in the policy on nature and landscape in Scotland, it is imprecisely defined, leaving it vague and intractable to an understanding of functional reality, as will be demonstrated in later chapters.

4.4.2 Policy in the voluntary sector

4.4.2.1 The National Trust for Scotland

In developing a Wild Land Policy, the National Trust for Scotland profess not to have been bound by the Unna Principles for the management of mountainous areas, referring to them as a “*period piece*” (40). However, they allow that there were a key part in shaping their thinking about management of their properties such as West Affric and Mar Lodge Estates. Thus the Trust said that the Wild Land Policy complements rather than replaces the Unna Principles.

Wild land in Scotland is defined in the Policy as being:

‘relatively remote and inaccessible, not noticeably affected by contemporary human activity, and offering high-quality opportunities to escape from the pressures of everyday living and to find spiritual and physical refreshment’

The policy identifies particular aspects of a place that enhance this wildness, and some indeed that detract from it. A sense of remoteness, scenic grandeur, solitude, peace and quietness, and particularly an absence of contemporary human development, all add to the wild character of a place. On the other hand, recent signs of human activity, particularly man in charge of nature, the presence of crowds or group activity, unsympathetic recreation, and manmade noise all detract from the wild character of a place.

These enhancers and detractors are given more comprehensively in the Policy as a table of Indicators of Wild Land Quality. These can be seen in Box 4.1.

Box 4.1 Indicators of wild land quality

Enhancers

- Sense of remoteness (linked to distance from roads, tracks and transport)
- Size of area and scale of landscape
- Scenic grandeur
- Surrounded by sea (islands)
- Solitude
- Roughness of terrain
- Peacefulness, quietness
- Absence of contemporary human activity or development
- Seemingly natural environment
- Evokes emotional experience whether first hand or at a distance
- Absence of re-assurance in a hazardous and challenging environment
- Physically demanding experience resulting in a sense of achievement, e.g. long walk in
- Scotland's climate
- Ruins and disused structures – where they add scale and fit the landscape

Neutral

- Deer stalking
- Sites of ancient habitation (see also Enhancers list)

Detractors

- Recent signs of human activity, particularly 'man in charge of nature' including intensive agriculture and insensitive forestry
- Recent human artefacts (including litter)
- Presence of crowds or group activity
- Unsympathetic recreation activities
- Man-made noise
- Facilities to make recreation easier or safer
- Ecological imbalance
- Visual intrusions eg roads, pylons, fences
- Mechanical transport
- Low flying jets & helicopters

Wild Land Policy, The National Trust for Scotland 2002

4.4.2.2 The John Muir Trust

In common with many other commentators, the John Muir Trusts acknowledges that almost nowhere in the UK is entirely natural or free of past or present human manipulation. Yet despite millennia of human influence, there are still areas that have remained substantially free of any major man-made intrusions and that have a wildland quality. In their Wild Land Policy from 2004, the Trust adopted a simple definition for prime, exemplary areas of wild land in the UK (41):

"Uninhabited land containing minimal evidence of human activity"

The nature of wildland is extensively explored in the Policy, including providing an indicative map of areas of wild land in Britain. In extending their concise definition, the Trust has developed identifiable characteristics which they believe provide criteria for wildland:

Wild land is:

- largely unaffected by human intervention
- remote or 'off the beaten track'
- rugged or physically challenging and naturally hazardous
- grand in scale

Wild land provides:

- a refuge for wildlife
- a sense of peace, quiet and solitude
- a sense of wonder, drama or awe
- inspiration and satisfaction

The Policy suggests that significance of individual wild land criteria varies from place to place, but for the key areas a grand sense of scale is for them particularly important. Perhaps an unwitting hostage to fortune in terms of promoting wildland, the Trust believe that the sense of wildness experienced by visitors, may be further enhanced by exposure to harsh weather or intimidating environmental conditions. Also, the Trust indicates that a greater distance from centre of urbanisation will inevitably result in a reduced level of human use and influence, which may not necessarily be the case under all situations.

4.5 Protection for wildland

The Convention on Biological Diversity (CBD) is an international legal instrument for the conservation and sustainable use of biological diversity. The Convention entered into force on 29 December 1993, and was ratified by the UK on the 3 June 1994 (42). Amongst the actions required of parties to the convention is the requirement to establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity, and to promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings (43). The Convention requires that reports are made on the measures taken for the implementation of the provisions of the Convention and their effectiveness in meeting the objectives. Since ratifying, the UK has responded with four national reports; thematic reports on such as Protected Areas, Mountain Ecosystems and Forest Ecosystems; as well as lodging the National Biodiversity Strategy and Action Plan.

The UK through the Joint Nature Conservation Committee (JNCC) also submits data on its system of protected areas to the Common Database on Designated Areas (CDDA) of the European Environment Agency (EEA) (44). The inventory of the CDDA is maintained for the EEA by the European Topic Centre on Biological Diversity, and is annually updated through the European environment information and observation network (Eionet). The EEA provides the European inventory of nationally designated areas to the World Database of Protected Areas (45).

Data held in the CDDA for the UK includes a database of its protected areas, as well as a range of spatial information for those protected areas that is suitable for use in Geographical Information Systems (GIS) (46). The latter is given for each of the protected area designations and broken down by country within the UK.

The database contains information on each individual designated area at a national level, including the national designation code; a site name, area and year of designation; location (NUTS Region Code); and an IUCN management category. The database also contains a digest of the national

designation codes, the names of the designations and references to the laws under which the designation takes place. A summary of the data set for Scotland is given in Table 4.1.

| National code | Type of protected area | No. | Range in area (ha) | Total area (ha) | Date of first designation | IUCN Category |
|---------------|--------------------------|-------|--------------------|-----------------|---------------------------|---------------|
| UK01 | National Nature Reserve | 66 | 7-25,949 | 137,275 | 1951-2007 | IV |
| UK04 | SSSI | 1,456 | 0-29,995 | 1,038,554 | 1949-2008 | IV |
| UK84 | Marine Consultation Area | 29 | 7-33,900 | 111,895 | 1986-1990 | N/A |
| UK87 | Voluntary Reserve | 1 | 1,030 | 1,030 | 1984 | N/A |
| UK88 | Regional Park | 4 | 6,475-4,420 | 86,160 | 1986-1990 | N/A |
| UK91 | National Scenic Area | 40 | 3,108-202,388 | 1,378,358 | 1980 | V |
| UK93 | Forest Park | 3 | 5,100-60,700 | 92,500 | - | - |
| UK96 | Local Nature Reserve | 54 | 1-2,885 | 9,953 | 1952-2009 | N/A |
| UK97 | National Park | 2 | 186,339-381,653 | 567,993 | 2002, 2003 | V |

Table 4.1 CDDA data for national protected areas in Scotland

The data in Table 4.1 concurs on a category basis, and mostly on a number basis to a protected areas summary of Natural Heritage Designations in Scotland obtained through the SNH website (47). However, certain categories of protected area in Scotland that have European significance are not reported in the CDDA, such as four Biosphere and two Biogenetic Reserves, three European Geoparks, one World Heritage Site, 51 Ramsar sites, 239 Special Areas of Conservation (SAC) and 147 Special Protection Areas (SPA). All Ramsar sites in Scotland are also either SPAs or SACs, and many are also Sites of Special Scientific Interest (SSSIs), as are the SPAs and SACs, although the boundaries of the different designations are not always the same.

The references to laws for the designation of protected area types in the CDDA reflect recent additions to the legislation in Scotland, such as for the national parks. A review follows of the legislative (or other) means for the main protected area categories so that it reveals their aims.

4.5.1 National Parks

The two national parks in Scotland were designated under the National Parks (Scotland) Act 2000 (48). The aims of a National park are:

- (a) to conserve and enhance the natural and cultural heritage of the area,
- (b) to promote sustainable use of the natural resources of the area,
- (c) to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public, and
- (d) to promote sustainable economic and social development of the area's communities

The Scottish Ministers can designate an area as a National Park on the basis that is of outstanding national importance because of its natural heritage or the combination of its natural and cultural heritage, and that the area has a distinctive character and a coherent identity. These two definitions are given later in the Act:

- "*cultural heritage*" includes structures and other remains resulting from human activity of all periods, language, traditions, ways of life and the historic, artistic and literary associations of people, places and landscapes
- "*natural heritage*" includes the flora and fauna of a National Park or a proposed National Park, its geological and physiographical features and its natural beauty and amenity

The Act allows for the Scottish Ministers to establish an authority to exercise the functions conferred on it in the Act. In Schedule 2 of the Act, National Park authorities are given the power to acquire

land which is within the National Park, either by agreement or compulsorily with the authorisation of the Scottish Ministers. They also have the powers to make byelaws to protect the natural and cultural heritage of the National Park, prevent damage to the land or anything in, on or under it, and secure the public's enjoyment of, and safety in, the National Park. The particular examples given in the Act of areas where byelaws would be appropriate concern the lighting of fires, rubbish and litter, nuisance, vehicles, and recreational activities.

There is no description or overt reference in the legislation for the National Parks that requires a park to make a contribution to any of the measures required under the Convention on Biological Diversity (see above) such as conserving biological diversity, protection of ecosystems and natural habitats, nor the maintenance of viable populations of species in natural surroundings. It is however, under Part 1 of the Nature Conservation (Scotland) Act 2004, the duty of every public body (including National Park Authorities) in exercising any functions, to further the conservation of biodiversity, and to do so with reference to the Convention on Biodiversity, and thus to the measures required (see above). However, the lack of explicitness renders this conditional, and without consistency.

4.5.2 Sites of Special Scientific Interest

The SSSIs of Scotland are now designated under Part 2 of the Nature Conservation (Scotland) Act 2004 (49). There is no explicit aim given in the Act for a SSSI. However, the notification of a SSSI is on the basis of the special interest of its natural features, those natural features of land being references to any of its flora or fauna or geological or geomorphological features. The Act requires that SNH should develop a series of SSSIs in Scotland that is representative of the diversity and geographic range of Scotland's natural features, and which also makes a contribution to the overall mix of protected areas in Britain and Europe.

The notification given to the land owner must contain the acts or omissions which appear to SNH to be likely to damage that natural feature (Operations Requiring Consent). The SSSI notification must also be accompanied by a site management statement, a separate document which provides practical guidance to the owners and occupiers of the SSSI as to how the natural feature specified in the SSSI notification should be conserved or enhanced.

The Act gave SNH powers to make byelaws to protect SSSIs. In addition, it gave Ministers the power to issue Nature Conservation Orders (NCO) that restrict the carrying out of a specified operation on specified land (a SSSI or on land adjacent), and Land Management Orders (LMO) that maybe necessary for the purpose of conserving, restoring or otherwise enhancing the natural features specified in a notification for an SSSI or on land adjacent. SNH are given the power to acquire land that is within a SSSI or subject to an NCO or LMO, either by agreement or compulsorily with the authorisation of the Scottish Ministers.

It should be noted that in Part 1 of the Nature Conservation (Scotland) Act 2004, a specific duty is placed on the Scottish Ministers to designate a Scottish Biodiversity Strategy. No detail is given as to the process of devising the strategy, or to its content, but within one year of a it being designated, the Act requires that Scottish Ministers publish lists of species of flora and fauna, and of habitats considered to be of principal importance for the purpose of the public duty in exercising any functions, to further the conservation of biodiversity (see previous section).

4.5.3 National Scenic Areas

The 40 National Scenic Areas of Scotland were designated in 1980, but the legislation applying to them now is an additional section to the Town and Country Planning (Scotland) Act 1997 that is

contained in Part 10 of the Planning etc. (Scotland) Act 2006 (50). In deciding whether to designate an area as a National Scenic Area, Ministers take account of:

- (a) whether the area is of outstanding natural beauty,
- (b) the amenity of the area, including whether it is of historical, cultural or environmental importance
- (c) any flora, fauna or physiographical features of the area, whether or not to any extent the product of human intervention in the landscape

The new statutory framework within which provision was made for the identification and protection of NSAs in Planning Etc (Scotland) Act 2006 also allowed Ministers to issue statutory guidance to assist planning authorities in their duties for the care of designated areas and to make procedural regulations for designation of NSAs.

NSAs are thus primarily regulated through planning controls, with the requirement that development plans include measures for the conservation of natural beauty and amenity and the improvement of the physical environment. NSAs were recognised at the national level through policy guidance issued in NPPG14 on Natural Heritage. That, however, was superseded by Scottish Planning Policy (see section 3.4.1) in which it states that development that affects an NSA should only be permitted where:

- it will not adversely affect the integrity of the area or the qualities for which it has been designated, or
- any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.

4.5.4 Local Nature Reserves, Forest Nature Reserves and National Nature Reserves

All of these reserves are designated under the National Parks and Access to the Countryside Act 1949 (51). Local authorities select and designate Local Nature Reserves using their powers under section 21 of the Act (52) to provide reserves on any land in their area. The five Forest Nature Reserves in Scotland are conservation sites owned and managed by Forestry Commission Scotland, and were first established as nature reserves under section 19 of the Act (53). The meaning of a nature reserve in the Act is land managed for the purpose of providing opportunities for the study of the fauna and flora of Britain and for the study of geological and physiographical feature, and of preserving flora, fauna or geological or physiographical features of special interest in the area.

National Nature Reserves (NNRs) are areas where the main purpose of management is the conservation of habitats and species of national and international significance (54). They are designated under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981, but since nearly all are SSSIs and most are also covered by SACs or SPAs, then their aim reverts to that for SSSIs in the Nature Conservation (Scotland) Act 2004.

SNH owns and manages many of the NNRs, and some are in the beneficial ownership of organisations like the FCS, RSPB, NTS, the Scottish Wildlife Trust and South Lanarkshire Council. There are also a few NNRs that are privately owned and managed in agreement with the landowner.

4.5.5 Regional Park, Forest Park, Woodland Park and Caledonian Forest Reserve

The three Regional parks are large areas of attractive countryside that lie close to Scotland's larger towns and cities, and which can also provide important havens for wildlife (55). The parks were created in order to provide co-ordinated management for recreation alongside other land uses such as farming and forestry. Regional parks are managed by local authorities, with support from SNH.

The six Forest parks and seven Woodland parks were established by the Forestry Commission Scotland and are woodlands managed for access. The 16 Caledonian forest reserves are ancient and semi-natural woodland managed by Forestry Commission Scotland and where primary objective of management is environmental conservation. While all three are non-statutory designations (53) but there is overlap with SSSIs.

4.5.6 Marine Consultation Areas

Marine Consultation Areas are a non-statutory designation that was given to sensitive marine habitats and species in the near-shore marine environment, providing them with an identity that could be considered when development pressures from such as aquaculture were proposed (56). The purpose of this designation will eventually be superseded when the network of Marine Protection Areas is established under the Marine (Scotland) Act 2010 (57).

4.5.7 Geoparks

A geopark is an area of outstanding interest for its rocks and landforms, and where education and tourism initiatives in the geopark can benefit local people and businesses (58). Proposals for a geopark are developed by partnerships of local communities, local authorities, Earth scientists and SNH. An application is submitted to the European Geoparks Network. Once accepted, the geopark is endorsed by UNESCO, so that all European Geoparks are also UNESCO Global Geoparks.

Geoparks are protected by a management group. These groups co-ordinate activities and promotion of the geopark, and which encourages businesses within the geopark that make use of or benefit from the areas geological heritage to ensure that their activities and environmentally sustainable and support conservation of that heritage.

4.5.8 RAMSAR sites

The UK Government signed up to the Convention of Wetlands of International Importance in 1976. Since then, wetland sites have been designated for inclusion in the Ramsar List of Wetlands of International Importance. The Convention requires *"the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world"*

There are currently 51 Ramsar sites designated in Scotland, covering a total area of about 313,500 hectares (59). Their interest lies in a wide variety of waterbirds, bogs, lochs, coastal wetlands and other water-dependent habitats and species. There is no specific legal framework that safeguards Scottish Ramsar sites. However, all Ramsar sites in Scotland are also either SPAs or SACs, and many are also SSSIs, although the boundaries of the different designations are not always exactly the same. SNH includes Ramsar sites in its site condition monitoring programme. Funding to carry out conservation management is available through the Scotland Rural Development Programme.

4.6 IUCN protected area management categories

Four of the protected area designations given in the CDDA data set of the national data for Scotland were assigned categories under the International Union for Conservation of Nature (IUCN) Protected Area Management Categories (see table 4.1): SSSIs and NNRs are shown as Category IV, while National Parks and National Scenic Areas are shown as Category V.

The protected area management categories were developed by the IUCN so that protected areas could be classified according to their management objectives. The categories are used by many national governments to define and record their protected areas, and they are increasingly being incorporated into government legislation (as will be shown in Chapter 5).

The CBD Programme of Work on Protected Areas recently reaffirmed its endorsement, that it (60):
“recognizes the value of a single international classification system for protected areas and the benefit of providing information that is comparable across countries and regions and therefore welcomes the ongoing efforts of the IUCN World Commission on Protected Areas to refine the IUCN system of categories and encourages Parties, other Governments and relevant organizations to assign protected-area management categories to their protected areas, providing information consistent with the refined IUCN categories for reporting purposes”

The IUCN Guidelines for Applying Protected Area Management Categories are an aid in classifying protected areas, giving detailed reasons for and descriptions of each of the categories(61). A Category IV protected area is a Habitat/species management area. This category embodies a management approach used in areas that have undergone substantial modification. The areas protect fragments of ecosystems or habitats, not complete functioning ecosystems, and thus are unlikely to be self-sustaining. They are often established to protect particular species or habitats, and will require regular and active management interventions to maintain their associated biodiversity. On the basis of their aims given earlier, the classification of NNRs and SSSIs as IUCN Category IV would seem to be appropriate.

A Category V protected area is a Protected landscape (or Seascape). The level of modification has been more intense, such that they are cultural landscapes that have been altered by humans over hundreds or even thousands of years with major changes to ecology and species diversity. They contain permanent human settlements and thus management interventions in Category V protected areas are aimed at sustaining human livelihoods and are not just part of a biodiversity management strategy. They are thus selected as an area where the interaction of people and nature over time has produced a distinct character with significant nature conservation, cultural and scenic value.

Category V protected areas play a role in conservation at the landscape scale, and may act as a buffer around a core of one or more strictly protected areas to help to ensure that land and water-use activities in the larger area do not threaten their integrity. They may also act as linking habitat between several other protected areas. On the basis of their aims given earlier, the classification of National parks and National Scenic Areas as IUCN Category V would again seem appropriate.

The complete list of IUCN protected area categories is given in Table 4.2. As will be shown in Chapter 5, those countries that base legislation for their national protected area systems on the IUCN Categories, provide themselves with a clear and enforceable regime for the protection of wildland.

| IUCN Cat. | Protected area | Objective |
|-----------|---------------------------------------|--|
| Ia & b | Strict Nature Reserve/Wilderness Area | Strict protection |
| II | National Park | Ecosystem protection and recreation |
| III | Natural Monument | Conservation of natural features |
| IV | Habitat/Species Management Area | Conservation through active management |
| V | Protected Landscape/Seascape | Landscape/seascape conservation and recreation |
| VI | Managed Resource Protected Area | Sustainable use of natural resources |

Table 4.2 The IUCN Management Categories for protected areas

4.7 Summary

It is intriguing to reflect on the raising of funds to purchase Glen Coe in the 1930's because it indicated a strong willingness of individuals who cared for the mountains as places of recreational and landscape value to give freely to protect them for the future. Unna contextualized the purchase and transfer to the NTS through a set of principles that he produced for this mountainous area, a primary principle being that the land be maintained in its primitive condition for all time. Perhaps we should think of this as being one of the first protected areas in Britain where its quality of wildness had to be maintained, albeit without a legislative framework.

Equally significant, it was perhaps indicative of a will if not for public ownership, then certainly for beneficial ownership of land of high landscape and nature conservation interest. As can be seen today, the protected area system that has developed in Scotland (and the rest of Britain) is blind to ownership, with only a proportion of National Nature Reserves being outwardly vested in public or beneficial ownership. That essence of a "*public*" national protected area system that was prefigured by the purchase and transfer of Glen Coe in the 1930's, and which characterises significant elements of many of the national protected area systems across Europe (see later Chapters) was thus an opportunity that was not grasped.

Wildland is embedded in the policy on nature and landscape in Scotland, both in Government and the voluntary sector. However, it comes across as being imprecisely defined, leaving it vague and intractable to an understanding of functional reality, as can be concluded when set against the discussions of the previous chapter. The context of wildland is best understood with reference to functional example and within the framework of a continuum. The latter is a way of illustrating cause and effect (outcome) rather than the approach at present of propagating a quality of elusiveness while maintaining its pervasiveness.

In addition, the current legislation supporting terrestrial designations in Scotland, even though it's development was contemporaneous with the evolution and development of wildland policy (see sections 4.4.1 and 4.4.2) was not intended to safeguard wildland along the continuum, as it is either based on species and habitats, or on scenic beauty, rather than whole area protection and restrictions on extractive land use (see section 4.5). Thus the primary approach of protection is development management, the regulation of built physical structures, with no explicit context for the control of other land uses that would erode the characteristic of wildness.

The protected areas of Scotland are classified in IUCN Categories IV and V, and this is entirely appropriate given the concurrence between the aims of the national legislation, the predominant reality of those protected areas, and the objectives of these IUCN categories. However, that system of classification has other protected areas with objectives not yet represented in Scottish legislation for terrestrial protected areas. As was discussed in section 3.4, IUCN advocate that a well balanced protected area system should consider using all the categories. On this basis, it can be argued that a balance in our landscapes would be for wild areas to exist within all possibilities of the continuum, and not just at one point. It will be shown in Chapter 8 that there is legislation that exists in Scotland that would more precisely meet the need for area protection of functioning ecosystems and which could be used to designate for protected areas along the continuum.

CHAPTER 5 EUROPEAN WILDLAND AND THE IUCN SYSTEM OF PROTECTED AREA CATEGORIES

This chapter explores the utility of mapping the wildland continuum across Europe as a means of identifying wilderness and wildland areas in Europe, but also in identifying which protected area system has the greatest discrimination for wildness. The origin of the datasets and methodology employed in this chapter are given in Annex 1-4.

5.1 Evaluation of the Wildland Quality Index

Maps of the wilderness continuum were drawn up using a Geographic Information System (GIS)-based methodology and the latest and most detailed data available for Europe (EU member states plus Norway, Switzerland and the Balkans). This incorporated information on population density, land cover/use, transport and accessibility, and topography.

A map of the wilderness continuum in Europe is shown in Fig. 5.1, with the degree of wildness represented by a Wildland Quality Index (WQI). Visual inspection of areas with higher WQI values show a prevalence in Iceland, Scandinavia, Central and Southern Europe. It may be expected that a large proportion of this wildland would be found in high altitude and high latitude areas (i.e. arctic and mountainous regions) (see Fig. 5.2). However, significant areas of high WQI exist outside of mountainous regions, as is shown in most of Finland, parts of Sweden, and in Estonia, Latvia and eastern Poland.

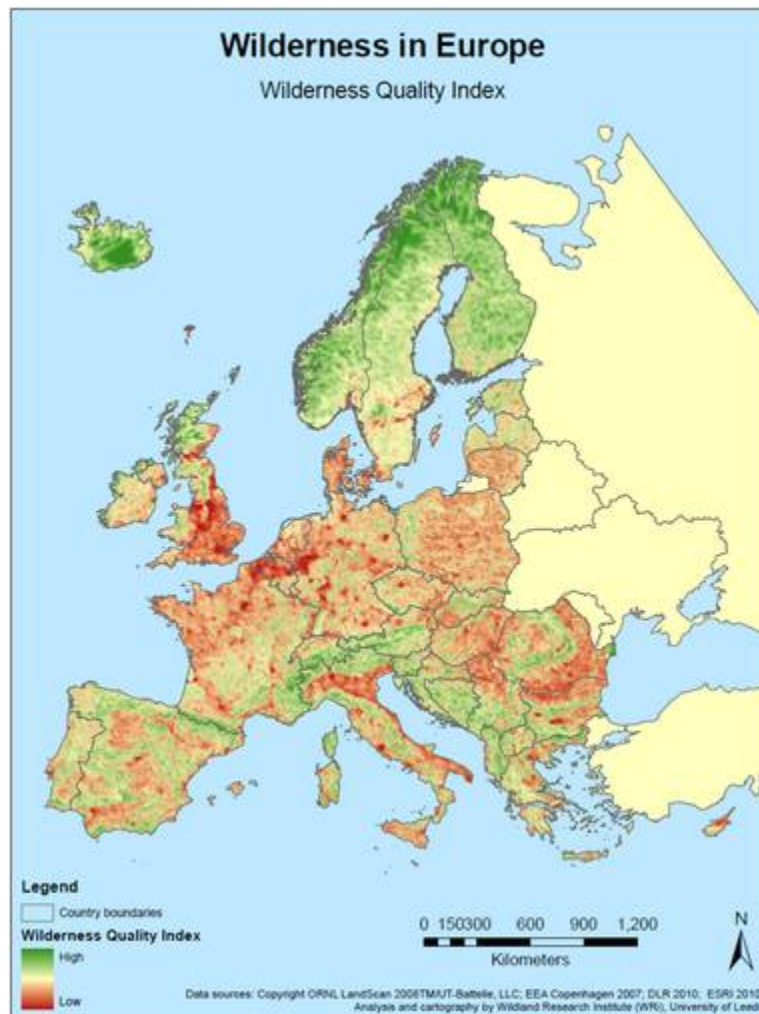


Figure 5.1 Wilderness in Europe – Wildland Quality Index

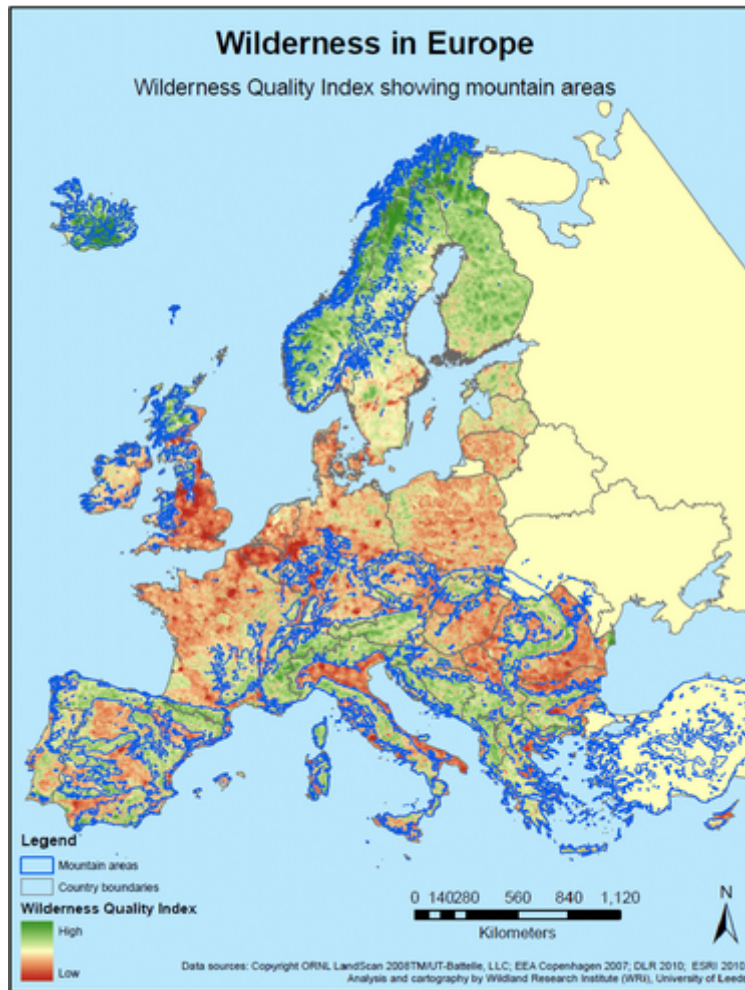


Figure 5.2 Wilderness in Europe – Wildland Quality Index showing mountain areas

To establish the worth of the WQI in searching out areas of wildland, the datasets for keystone species in Annex II of the Natura 2000 protected areas system were overlaid on the wilderness continuum map. The Habitats Directive requires that protected areas are established in EU member states for the areas inhabited by species listed in Annex II of the Directive (1). The assumption behind their use in the evaluation was that keystone species on the list – the large carnivores and bison – have a natural range represented within the protected areas that is indicative of the biophysical reality needed by their habitat requirements (2, 3). The assumption is therefore that this would be the equivalent to the wilder areas of Europe.

The map overlays for protected areas for wolf, brown bear, Eurasian lynx, Iberian lynx, Arctic fox, wolverine and bison are shown in Figs. 5.3-5.7. Visual inspection indicates that there is a high correlation between protected areas for these keystone species with the higher end of the WQI.

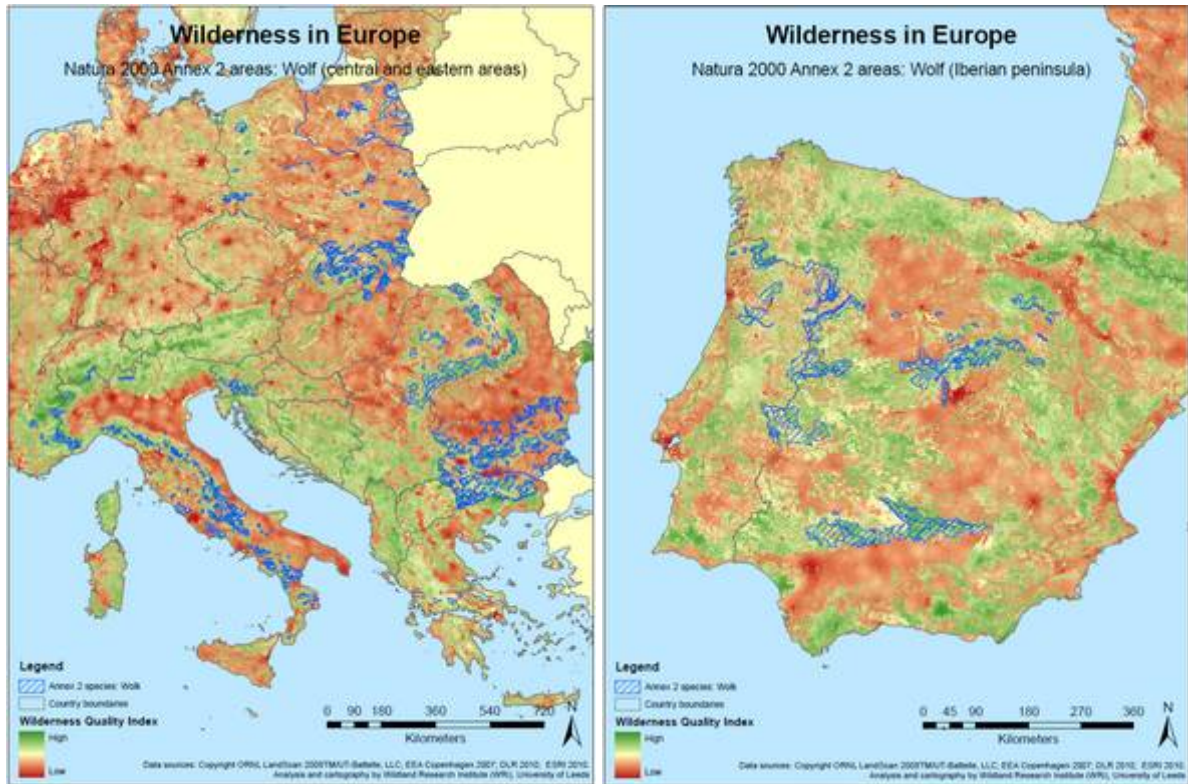


Figure 5.3a & b Natura 2000 sites for wolf in central and eastern Europe (a) and in the Iberian peninsula (b)

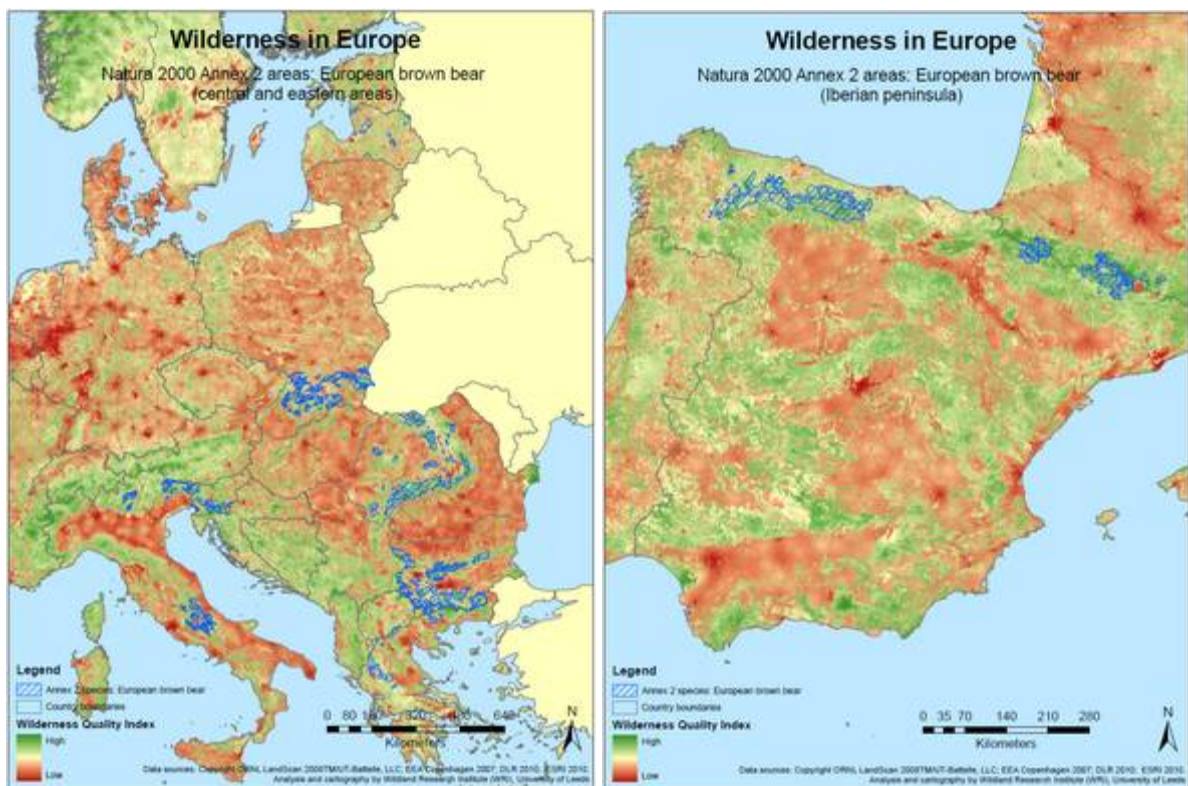


Figure 5.4 Natura 2000 sites for brown bear in central and eastern Europe (a) and in the Iberian peninsula (b)

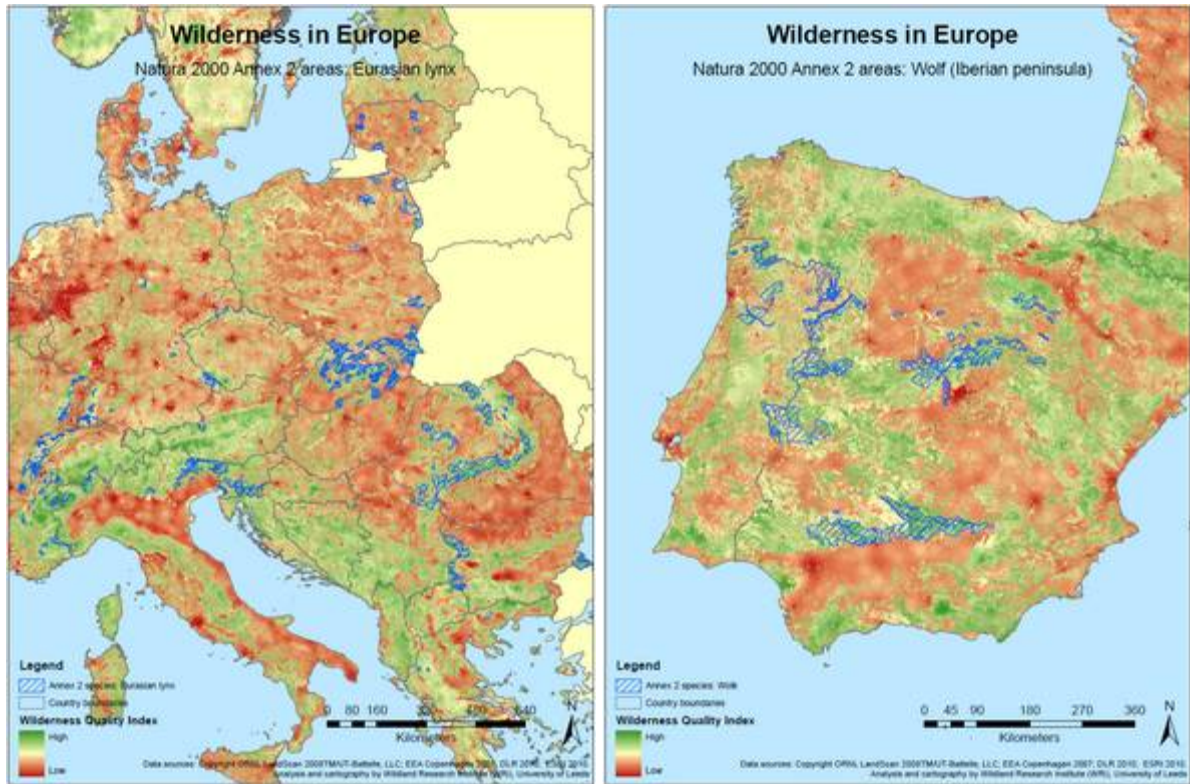


Figure 5.5 Natura 2000 sites for Eurasian lynx in central and eastern Europe (a) and Pardo lynx in the Iberian peninsula (b)

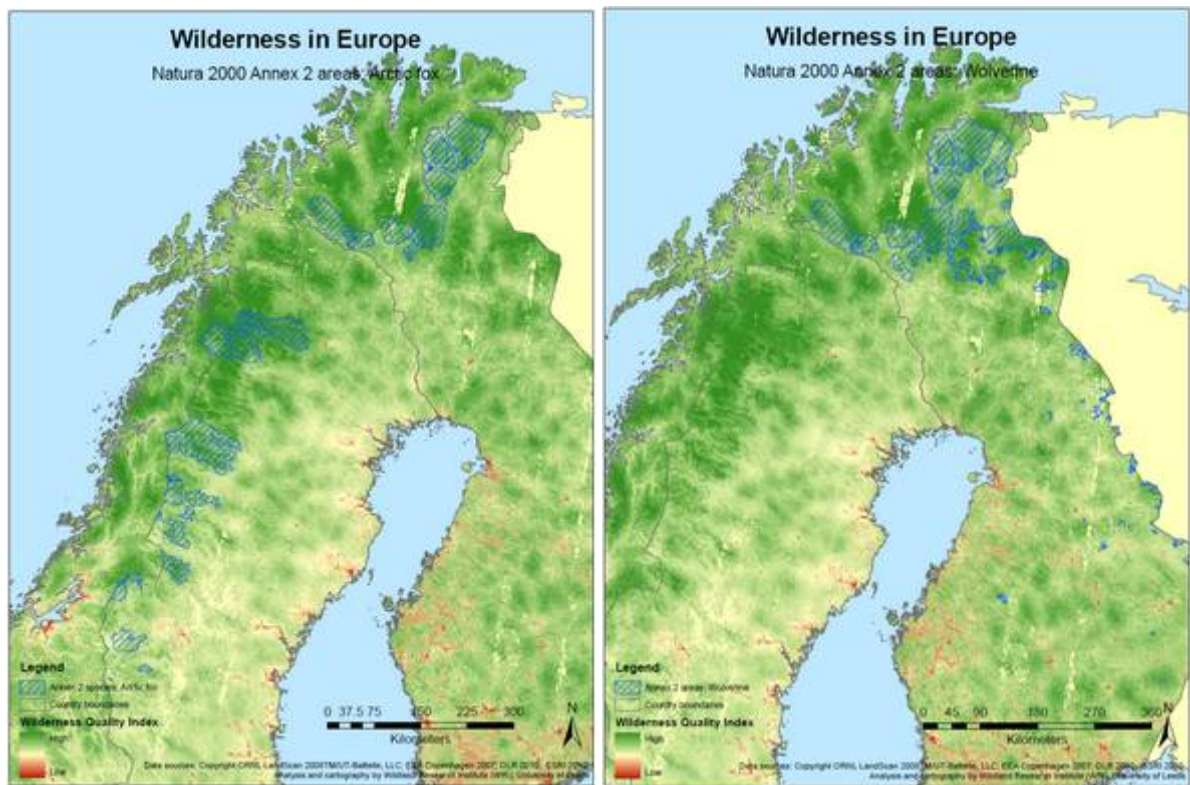


Figure 5.6 Natura 2000 sites for Arctic fox (a) and wolverine (b) in Europe



Fig. 5.7 Natura 2000 sites for bison in Poland

When all Natura 2000 protected areas are overlaid on the wilderness continuum, there is very little correlation between the total spectrum of protected areas and the higher end of the WQI (see Fig. 5.8). GIS software allows for numerical evaluation in comparisons of datasets, and this confirmed the low correlation (see Annex 1). Spatial data for protected areas classified under all the IUCN categories are also overlaid onto the wilderness continuum (see Fig 5.9) and a similar situation can be seen with a lack of correlation with the higher end of the WQI.

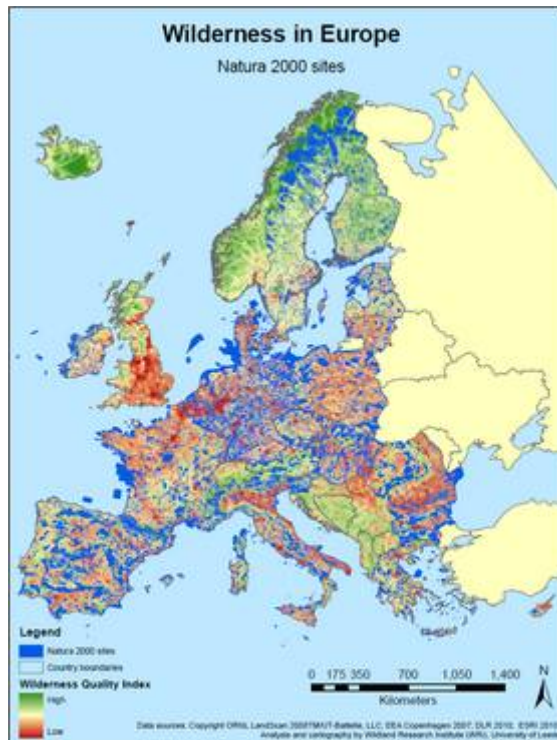


Figure 5.8 All Natura 2000 sites in Europe

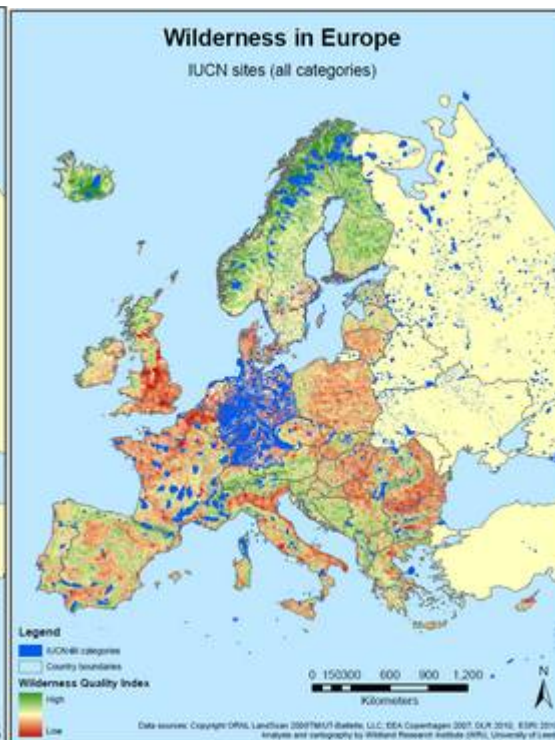


Figure 5.9 All IUCN Categories

However, the IUCN system contains categories of protected area that are classified on a range of management approach, unlike the Natura 2000 system which is based on habitat types and species. Thus when the spatial data of only Category I (a & b) and Category II protected areas were overlaid, then both visual inspection and mathematical evaluation give a high correlation with the higher end of the WQI (see Fig. 5.10). To further evaluate the WQI, the data of the wilderness continuum map is reclassified to give the top 5% wildest areas, and this is overlaid on the wilderness continuum (Fig. 5.11). This brings a focus to the greatest probability of where wildland exists, and could be used in comparisons with other potential methods of identification, such as the protected area systems that exist in Europe.

As an initial observation, it would seem that the area occupied by Category I and II is easily accommodated within the top %5 WQI, suggesting that if these areas are protective of wildland then there is the potential for more wildland to be designated across Europe.

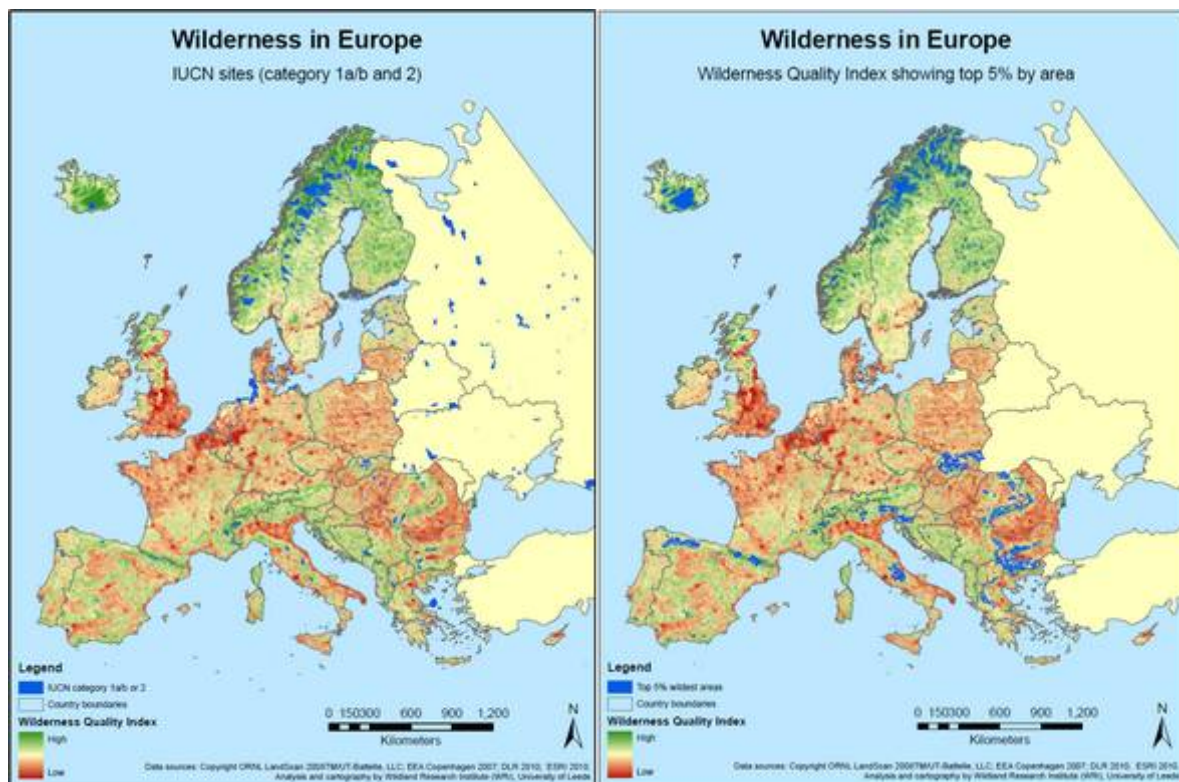


Figure 5.10 IUCN Categories Ia, Ib and II

Figure 5.11 The top 5% WQI

For the purposes of a closer evaluation of WQI, a single country area was chosen for inspection. Germany has a very high proportion of its land in protected areas (4). This is demonstrated by overlays of the Natura 2000 system, and of all the categories of the IUCN system on to the wildland continuum (see Fig. 5.12). Both maps show a high proportion of land with some protected area status, but note that while there is some congruence between the areas of the two protected area systems, there is not a direct match. Moreover, the top 5% wildest areas are entirely subsumed, as is also shown.

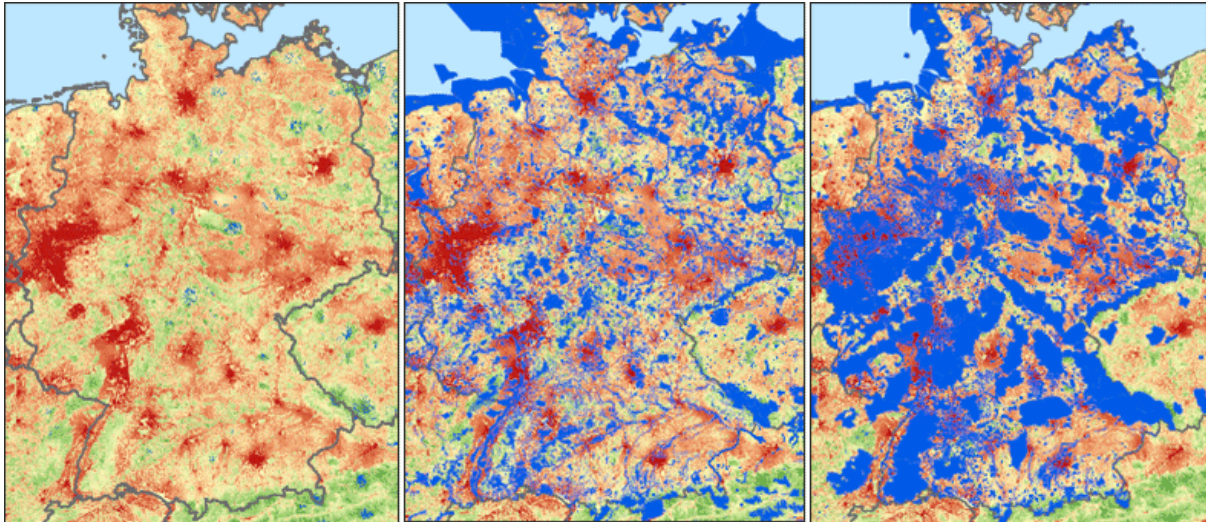


Figure 5.12 The top 5%(a) Natura 2000 sites (b) and all IUCN categories (c) in Germany

On this basis, neither system of protected areas would seem capable of discriminating for wildland. However, the IUCN system of protected areas has a number of categories and, as was indicated earlier, the first two categories of the system, Category I and II are considered to protect areas that have higher naturalness (see Fig. 3.3). Overlays of the top 5% wildest areas, the Natura 2000 sites for lynx, and IUCN categories I and II on the wilderness continuum are shown in Fig. 5.13. A visual comparison between these overlays shows a high degree of correlation between the attributes of all mappings.

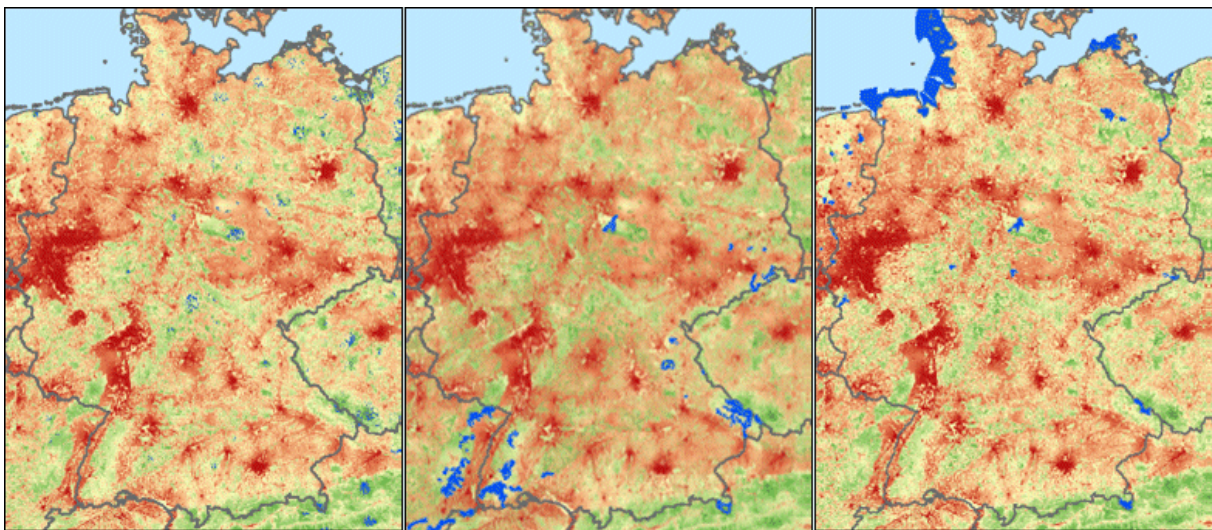


Figure 5.13 The top 5%(a) Natura 2000 sites for lynx (b) and IUCN Categories I and II (c) in Germany

A number of conclusions can be drawn from the evaluation of the WQI. It has validity as an indicator of the wilder areas in Europe, as is shown by the concurrence between the higher end of the WQI and the protected areas for keystone species. While the Natura 2000 system of protected areas covers some of the wildest parts of Europe, apart from selected protected areas for keystone species, it lacks discrimination as a tool in understanding the identity and distribution of the wildest areas. The same could be said of the IUCN system of categories of protected areas. However, for IUCN categories I and II, where the objectives are strict protection and ecosystem protection, the correlation is very high, both across Europe, and in the particular case of Germany.

The correlation between the top 5% wildest areas, protected areas of keystone species and IUCN Categories I and II can be taken as an indication of the successful outcome of the objectives of those protected areas under the IUCN system. It is perhaps a circular argument, in the sense that many of those protected areas within countries were designated under national systems before the IUCN categories first were drawn up in 1994. Thus authorities recognised their areas of natural value in their national interest, and have then subsequently given explicit recognition of that value by classifying their existing protected areas within the categories of the IUCN system.

If protected areas in Europe classified with categories I and II are a very strong indicator for the presence of wildland, then those protected areas themselves can be taken as a proxy for the distribution and status of wildland across Europe. This is explored in the next section.

5.2 The status of wildland across Europe

As was explained in section 4.5, the Common Database on Designated Areas of the European Environment Agency (EEA) contains information on each individual designated area at national level, including the national designation code; a site name, area and year of designation; location (NUTS Region Code); and an IUCN management category. To obtain a proxy for wildland across Europe, the database was analysed for the number and total area for each category of protected area classified under the IUCN system for 45 European countries (5). These tables are given in full in Annex 3. (Table A3.1 and A3.2)

Category I and II protected areas were identified in the previous section as having the best fit with the top 5% of wildest areas, and the number of these for each European country is shown in Table 5.1. These categories are known under the system as Strict nature reserve/scientific reserve (Category Ia), wilderness areas (Category Ib) and national parks (Category II) (see Table 4.2). The data for Category III protected areas are also included. This is the category for classification of Natural Monuments in which natural features such as caves, waterfalls, fossil beds, coastal stacks, or even a living feature such as an ancient grove, all receive protection. They are generally quite small protected areas, which is why they were not used in the mapping along with the Category I and II protected areas, but they are managed in much the same way as Category II protected areas (6) and thus why they are shown to be in a similar position on the trend between IUCN categories and naturalness (see Fig. 3.3).

| | IUCN Categories | | | | | IUCN Categories | | | |
|--------------------|-----------------|-----|----|------|---------------|-----------------|-----|-----|------|
| | Ia | Ib | II | III | | Ia | Ib | II | III |
| Albania | 2 | | 14 | 749 | Liechtenstein | | 9 | | |
| Armenia | 6 | | 2 | | Lithuania | 6 | | 5 | |
| Austria | 3 | | 7 | 249 | Luxembourg | | 34 | 2 | |
| Azerbaijan | 15 | | | | Macedonia | 4 | | 3 | 56 |
| Belarus | 2 | | 2 | 315 | Malta | 3 | 65 | 4 | 45 |
| Belgium | | | 9 | | Moldova | 5 | | | 22 |
| Bosnia Herzegovina | | | | 2 | Montenegro | | | 4 | 1 |
| Bulgaria | 1 | 54 | 3 | 836 | Netherlands | | | 22 | |
| Croatia | 2 | 81 | 8 | 279 | Norway | 1866 | 1 | 29 | 91 |
| Cyprus | 1 | 1 | 14 | 6 | Poland | 1 | | 15 | |
| Czech Republic | | 10 | 4 | 485 | Portugal | 18 | 5 | 1 | 29 |
| Denmark | 6 | 7 | 9 | 20 | Romania | 77 | | 13 | 230 |
| Estonia | 29 | 857 | | 1202 | Russia | 73 | | 36 | 7886 |
| Finland | 20 | 6 | 34 | 2 | Serbia | 7 | 1 | 2 | 57 |
| France | 37 | | 5 | 24 | Slovakia | | 607 | 9 | 301 |
| Georgia | 20 | | 4 | | Slovenia | 6 | 50 | 1 | 1154 |
| Germany | | | 14 | | Spain | 6 | 35 | 62 | 189 |
| Greece | 5 | | 19 | 70 | Sweden | 1792 | 120 | 21 | 316 |
| Hungary | | | 5 | | Switzerland | 1 | | | 25 |
| Iceland | 2 | | 3 | 36 | Turkey | 518 | | 342 | 142 |
| Ireland | 75 | | 6 | | UK | | | | |
| Italy | 115 | | 22 | 41 | Ukraine | 23 | | 8 | 3054 |
| Latvia | 4 | | 46 | 355 | | | | | |

Table 5.1 Number of IUCN Category I, II and III protected areas in Europe

In terms of overall number, Sweden, Norway, Estonia, Turkey and Slovakia have the most protected areas classified as Category Ia and Ib, and Category (Table 5.1). Bosnia Herzegovina and the UK are the only countries not to have any protected areas classified in category I or II, but Bosnia Herzegovina recently removed the classification of their Category I and II protected areas in consideration of their condition (7). Russia, Ukraine, Estonia, Slovenia, Bulgaria and Albania have the highest number of protected areas under Category III, but not all countries classify protected areas under this category (32 out of 45). The UK has no protected areas classified under Category III, and thus is the only country in the 45 of Europe that has no protected areas in categories I, II or III.

Russia, Norway, Italy, Sweden, Finland and Iceland have the most area protected under Categories I, II, and III, but when ranked on proportion of total area, Malta, Luxembourg, Iceland, Norway, Belgium and Armenia come out highest at between 9 and 26% (see Table 5.2). However, the average across Europe is 4.4%, the median about 2.8%, and with a range that has 10 countries with less than 1% of their land area protected in these categories.

In terms of the total areas in Europe of the categories, there are 20,920,839ha in Category Ia&b protected areas; a similar amount at 21,811,562ha in category II: and with the smallest total area of 3,255,002ha in Category III. (see Table 5.2). These represent respectively 0.87, 0.91 and 0.13% of the total land area in Europe, and thus just under 2% for the top three IUCN categories.

| | IUCN Category areas (ha) | | | | Total area (ha) | % of country |
|----------------------|--------------------------|---------|------------|-----------|-----------------|--------------|
| | Ia | Ib | II | III | | |
| Malta | 104 | 7,637 | 194 | 486 | 8,421 | 26.65 |
| Luxembourg | | 3,511 | 51,807 | | 55,318 | 21.39 |
| Iceland | 7,968 | | 1,119,203 | 12,926 | 1,140,097 | 11.07 |
| Norway | 615,182 | 1,914 | 2,679,294 | 1,821 | 3,298,211 | 10.19 |
| Belgium | | | 306,971 | | 306,971 | 10.06 |
| Armenia | 102,685 | | 178,002 | | 280,687 | 9.44 |
| Slovakia | | 96,328 | 317,890 | 1,616 | 415,834 | 8.51 |
| Liechtenstein | | 1,307 | | | 1,307 | 8.17 |
| Macedonia | 12,855 | | 112,988 | 68,389 | 194,232 | 7.64 |
| Latvia | | 24,439 | 405,689 | 5,299 | 435,427 | 6.70 |
| Montenegro | | | 83,900 | 1,600 | 85,500 | 6.20 |
| Slovenia | 208 | 6,998 | 83,808 | 15,088 | 106,102 | 5.23 |
| Italy | 60,985 | | 1,414,330 | 2,263 | 1,477,578 | 4.90 |
| Cyprus | 3,331 | 23,884 | 16,031 | 494 | 43,740 | 4.73 |
| Estonia | 6,671 | 197,210 | | 264 | 204,145 | 4.54 |
| Georgia | 188,559 | | 71,849 | | 260,408 | 3.74 |
| Finland | 160,021 | 127,842 | 884,480 | 771 | 1,173,114 | 3.47 |
| Switzerland | 17,032 | | | 124,065 | 141,097 | 3.42 |
| Czech Republic | 17,227 | | 83,190 | 160,113 | 260,530 | 3.30 |
| Netherlands | | | 135,305 | | 135,305 | 3.26 |
| Bulgaria | 1,463 | 75,553 | 193,047 | 80,955 | 351,018 | 3.14 |
| Lithuania | 37,068 | | 156,949 | | 194,017 | 2.98 |
| Sweden | 218,396 | 335,399 | 698,083 | 35,275 | 1,287,153 | 2.86 |
| Germany | | | 962,326 | | 962,326 | 2.70 |
| Romania | 310,232 | | 318,894 | 9,627 | 638,753 | 2.69 |
| Hungary | | | 220,318 | | 220,318 | 2.37 |
| Azerbaijan | 196,464 | | | | 196,464 | 2.27 |
| Spain | 7,312 | 40,163 | 833,047 | 105,553 | 986,075 | 1.95 |
| Russia | 17,240,685 | | 8,582,378 | 2,441,935 | 28,264,998 | 1.66 |
| Turkey | 108,086 | | 840,788 | 5,286 | 954,160 | 1.22 |
| Portugal | 27,065 | 6,206 | 69,592 | 7,264 | 110,127 | 1.20 |
| Austria | 1,133 | | 92,216 | 4,956 | 98,305 | 1.17 |
| Belarus | 81,023 | | 159,097 | N/A | 240,120 | 1.16 |
| Ireland | 20,929 | | 59,171 | | 80,100 | 1.14 |
| Albania | 4,800 | | 17,231 | 8,199 | 30,230 | 1.05 |
| Croatia | 2,935 | 33,266 | 8,615 | 10,938 | 55,754 | 0.99 |
| Ukraine | 441,249 | | 49,209 | 80,719 | 571,177 | 0.95 |
| Greece | 3,495 | | 70,767 | 48,344 | 122,606 | 0.93 |
| Denmark | 1,730 | 14,597 | 12,264 | 8,330 | 36,921 | 0.86 |
| Serbia | 159 | 37 | 58,200 | 7,268 | 65,664 | 0.85 |
| Poland | 1,995 | | 203,120 | | 205,115 | 0.66 |
| Moldova | 19,378 | | | 1,184 | 20,562 | 0.61 |
| France | 6,123 | | 261,319 | 1,971 | 269,413 | 0.49 |
| Bosnia Herzegovina | | | | 2,003 | 2,003 | 0.04 |
| UK | | | | | 0 | |
| Total area in Europe | 19,924,548 | 996,291 | 21,811,562 | 3,255,002 | 45,987,403 | |
| % of area in Europe | 0.83 | 0.04 | 0.91 | 0.13 | 1.9 | |

Table 5.2 Area of IUCN Category I, II and III protected areas in Europe

That Scandinavian countries rate highly in terms of total area protected in categories that indicate wildland is unsurprising given the extent of the high end of the WQI shown for those countries in the map of wilderness continuum (see Fig 5.1) but in terms of proportion, Norway apart, it is some of the smaller countries that have given over more of their area. Thus Liechtenstein, Malta, Luxembourg, Armenia and Belgium are in the top 10 countries by proportion of area covered by protection under these categories, as well as being amongst the 10 countries with the smallest areas in Europe.

This may be surprising in the case of Belgium, since the WQI for that country would not suggest that such a proportion of its land is wild (see Fig 5.1). However, as will be shown in the next Chapter, the IUCN system of protected area categories has an aspirational dimension to it that could explain the situation with Belgium.

5.3 State-level legislation or policy for national protected area systems

Reviewing the protected area legislation for Scotland and identifying the aims for the different categories of protected area, revealed the limits to its suitability for protecting the full range of wildland that could be expected to exist along the continuum in Scotland (see section 4.7). Wildland across Europe, identified by high WQI, appears to receive its protection through classification of protected areas in the IUCN Categories I, II and III. While the guidelines for these categories provide a framework for that protection, it is not generally known to what extent these categories have been incorporated into the national legislation for protected areas. Thus the legislation for national protected area systems across Europe were translated where necessary, and were analysed for their categories of protected area designation. The full list of legislation by country is given in Annex 4.

Of the 45 countries analysed, 29 have protected area legislation in single Acts that have categories of protected area which mirror those of the IUCN system. The criteria for this judgement was that an article (or section) early in the Act, listed types of protected area that could designate for the first five IUCN categories: strict nature reserve/scientific reserve (Category I), national park (Category II), natural monument (Category III), nature reserve (category IV), and protected landscape (Category V) (See Table 4.2). It can then be seen that articles that followed in the legislation give the detail of the different categories of protected area, their means of protection and methods of designation.

The countries having this type of legislation are shown in Box 5.1 along with examples from the legislation in Albania and Portugal that show the article in the legislation that lists all the different protected area types. The article numbers in brackets after each protected area have been appended to show the later articles that deal specifically with the type of protected area.

Box 5.1 European countries with national protected area legislation that follows IUCN categories

Albania, Armenia, Austria, Azerbaijan, Belarus, Bosnia Herzegovina, Bulgaria, Croatia, Czech, Estonia, Georgia, Germany, Hungary, Iceland, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Ukraine (29/45)

Albania

Article 4

Categories of protected areas

1. Important or threatened parts of the environment are declared protected areas according to the following categories:

- a) strict nature reserve/scientific reserve (Category I); (Art 5)
- b) National Park (Category II); (Art 6)
- c) natural monument (Category III); (Art 7)
- d) manage natural resources / management area of habitats and species (Category IV), (Art 9)
- e) landscape protection (Category V); (Art 10)
- f) protected area managed resource / protected area of multiple-use (Category VI). (Art 11)

2. A buffer zone can be declared around a protected area.

Protected Areas Act, Albania - Nr. 8906, dated 6/6/2002, amended by On some Supplements and Changes in Law NR. 8906, dated 6.6.2002 "Protected Areas" Nr. 9868, dated 4/2/2008

Portugal

Article 11

Categories and types of protected areas

1 - Protected areas may be under national, regional or local interests that seek to safeguard.

2 - Without prejudice to paragraph 6, protected areas are classified into the following types:

- a) National Park; (Art 16)
- b) Natural park; (Art 17)
- c) Nature reserve; (Art 18)
- d) Protected Landscape; (Art 19)
- e) Natural monument. (Art 20)

Act on Conservation of Nature and Biodiversity, Portugal, Decree-Law No. 142/2008

Note that in the example for Albania, the sixth category of the IUCN system is listed as well – a protected area of managed resource/protected area of multiple use. Fifteen of the 45 countries surveyed in Europe have classified protected areas for category VI (see Table A3.1 in Annex 3). However, it is only in the legislation of Albania and Croatia that a specific article exists for this type of protected area. It thus does not seem to be a protected area type with a settled legislative definition, as was shown in section 3.2.2, where the Sámi wilderness areas in Finland are classified as Category VI in spite of being derived from "wilderness" legislation.

The Albanian article also contains a reference to buffer zones around protected areas. This will be covered further in Chapter 6.

There is some variation in the articles designating for nature reserves. Thus not all legislation has a separate protected area types for strict nature reserve/scientific reserve (Category Ia) and nature reserve/habitat reserve (Category IV), such as is shown in the example of Portugal where only "*nature reserve*" is specified (see Box 5.1). This however, has not prevented the Portuguese from classifying protected areas in both those categories (see Table A3.1 in Annex 3) and it is in the detail of the article on nature reserves later in the legislation where distinction is made. The protected area of "*nature reserve*" thus has to do double service in designating for both Category I and Category IV protected areas, and it is either in the subsequent articles of the legislation, or in the implementation of the designation that a distinction is made between the two.

Following on from this, only 10 countries specifically state "*strict nature reserves*" in their legislation (and see later). Since these countries (and many others) classify protected areas in or both Category Ia and Ib (see Table 1.5) then this definition must do double service.

Of the remaining countries whose legislation does not mirror the IUCN categories, two countries – Greece and Turkey - achieve a mirroring of the five IUCN categories over two or more legislative Acts. A further nine countries have the national park (Category II) protected area type in their protected area legislation (Cyprus, Finland, Italy, Lithuania, Norway, Switzerland) or in specific legislation for national parks (Denmark, France).

The UK has legislation for national parks that covers England and Wales, with Scotland having separate legislation, but this legislation is implemented in the form of protected landscapes, which are thus classified as Category V (see sections 3.1.1 and 4.5.1). This leaves Belgium, Ireland, Liechtenstein, Luxembourg, Malta and the Netherlands with national protected area legislation that, along with the UK, does not specifically designate for Category II National Parks. However, of these, all but Liechtenstein report protected areas classified as national parks under Category II (see Table 5.1).

In the case of Ireland, their National Parks and Wildlife Service state a commitment to classifying under the IUCN system (8)

"It is the policy of the Department of the Environment, Heritage and Local Government, endorsed by successive governments, to abide by the criteria and standards for National Parks as set by the IUCN"

The same commitment is made in the Netherlands (9):

"Generally, the selection, establishment and management of National Parks in the Netherlands follow as much as possible the concepts and guidelines from the IUCN Management Category System"

5.4 Definitions and aims in protected area legislation that characterise wildland

This section reviews national protected area system legislation for types of protected area that designate for IUCN Categories I, II and III.

5.4.1 Strict Nature Reserve/Wilderness areas

There are 38 out of 45 countries in Europe that classify protected areas in Category I (see table 5.1). In distinguishing between the two types in Category I, 34 countries classify in Category Ia – strict

nature reserve/scientific reserve. As was noted in section 5.3, only 11 countries specify *“strict nature reserves”* as the protected area type in the legislation for their national protected area systems. These countries are shown in Box 5.2 along with two examples of legislation from Macedonia and Finland. By joining two key aims from these examples, the aim of a strict reserve could be described as *“undisturbed natural development with no deliberate influence whatsoever on the natural processes in the habitat or on the species populations”*

Box 5.2 Strict Nature Reserves in protected area legislation in Europe

Albania, Belgium, Croatia, Finland, Georgia, Latvia, Lithuania, Macedonia, Montenegro, Serbia, Slovenia (11/45)

Macedonia

Category of Strict Natural Reserve

Article 68

(1) Strict Natural Reserve shall be an area, which, because of its significant or characteristic ecosystems, geological or physical and geographical features and/or species, as well as originally preserved wilderness, acquires the status of natural heritage, primarily for the purpose of carrying out scientific surveys or monitoring of the protection.

(2) The space of the area of the Strict Natural Reserve shall provide integrity and achievement of the objectives for which it acquired the status of natural heritage.

(3) The conservation of the biological diversity within the area of the Strict Natural Reserve shall be achieved through protection, with no deliberate influence whatsoever on the natural processes in the habitat or on the species populations

Law on Nature Protection, No. 67/2004, Macedonia

Finland

Section 12

Strict Nature Reserves

The designation and objectives of a strict nature reserve shall be prescribed by law if the site is at least 1,000 hectares in size, and otherwise by decree. A strict nature reserve can only be established on State-owned land.

A strict nature reserve should hold significance as a means of safeguarding undisturbed natural development, or for scientific research or education.

Nature Conservation Act 1996, Finland

It should be noted that Belgium doesn't classify any protected areas as Category Ia (see table 5.1) even though its national protected area legislation does have the ability to designate for a strict nature reserve.

Other countries use different names in their legislation for their strict reserves, and so in the legislation of Azerbaijan, Georgia, Italy and Russia, they are named as *“State Nature Reserves”*. The Article in the Azerbaijan legislation giving the aims of a State Nature Reserve is shown in Box 5.3 (below) as is the article that defines the activities that are prohibited in the reserve.

It should be noted that in the case of Azerbaijan, the strict nature reserves have limited access, essentially for scientific access, and not recreational use. Other strict nature reserves impose lesser

access restrictions, allowing hikers if they stay on trails. Finnish legislation gives us an example of this in Section 18 of their Nature Conservation Act:

"Restriction of Access in a Nature Reserve

Passage off marked trails, paths and other designated areas in a strict nature reserve is allowed only with special permission from the authority or agency in charge of the site"

Box 5.3 Aims of and restrictions in a State Nature Reserve in Azerbaijan

Article 18. Duties of the State Nature Reserves

The duties of the State Nature Reserves are:

- protection of natural areas to preserve the natural state of the genebank, biological diversity, ecological systems, and natural complexes and objects;
- organising and conducting research, and compiling of the Annals of Nature
- implementing ecological monitoring within the framework of state monitoring of the environment and natural resources
- participation in the state ecological appraisal of projects and schemes for allocation of economic and other facilities;
- assisting the training of scientific personnel and specialists in the field of environmental protection.

Article 19. Features of the special protection regime in State nature reserves

In addition to taking the necessary common measures to special protection, in the State of natural reserves shall be prohibited:

- construction of buildings, roads, pipelines and other communications;
- various geological prospecting;
- use of surface and groundwater to meet the needs of agriculture, industry, hydropower, and other economic needs in water;
- logging, harvesting of secondary forest resources, additional use of forests and use of forests for hunting;
- use of the plant world for economic purposes, as well as the meadows and pastures hunting and fishing, as well as the use of animals for economic purposes, not related to objects of hunting and fishing, and hunting for them
- application to the environment of a chemical, biological and physical effects;
- collection of collections, without special permission from studies of plants and animals with the isolation of the natural environment;
- fee collections, conducting research without express permission of plants and animals, taking them the natural environment;
- presence on the reserve without special permission.

Act on Protected areas and sites No. 840/IG, 2000

There are 13 countries that classify Category 1b areas as well as Category 1a Strict Nature Reserve areas (see table 5.1). In the main, there is not always a separate protected area type given in the respective countries legislation when there is this twofold classification in Category I. Finland, however, gives us example again, where it uses two categories under their Nature Conservation Act. As note above, Category 1a areas on state lands are "*Strict Nature Reserves*", defined in Section 12 of the Act (see Box 5.2 above). The Category 1b areas on state lands in Finland are designated under Section 17: "*Other Nature Reserves*". This section refers to the "*relevant provisions*" of Sections 13-15 that lay down the restrictions on activity in Strict Nature Reserves, National Parks and other nature

reserves, and thus provides a means for any differential that exists between Finland's Category Ia and Ib.

There are four countries that classify only Category Ib areas – Czech Republic, Liechtenstein, Luxembourg and Slovakia. In the Czech and Slovakian legislation, Category Ib areas are *“National Nature Reserves”*.

While IUCN Category Ib is termed a wilderness, a protected area type of *“wilderness”* is not found in the legislation for Category Ib areas. In fact there are very few incidences of that word in protected area legislation in Europe. It appears in the Article for Strict Nature Reserves in the Macedonian legislation in relation to the characteristic of areas that are given that designation (see Box 5.2 above).

The protected area legislation for Iceland contains a definition of wilderness as follows:

“an area of land at least 25 km² in size, or in which it is possible to enjoy the solitude and nature without disturbance from man-made structures or the traffic of motorised vehicles on the ground, which is at least 5 km away from manmade structures or other evidence of technology, such as power lines, power stations, reservoirs and main roads, where no direct indications of human activity are visible and nature can develop without anthropogenic pressures”

However, this definition of wilderness is linked in the Act to the national nature conservation strategy, rather than to the protected area type of *“Nature Reserve”* in the Icelandic legislation that is used to designate protected areas that are classified as Category Ia.

The legislation for the national protected area system of Belarus recognises that there may be a range of zones within their national parks, one of which is given as:

“the wilderness protection zone, designed to save in a natural state of natural objects, ensuring their natural development, which prohibits all kinds of activities, in addition to conducting research and conservation activities”

In terms of implementation, European countries report to the CDDA, various types of protected area that they classify as Category I areas, in addition to those given in legislation. Thus Estonia has the following: *“Strictly protected zone of a National Park”, “Strictly protected zone of Nature Reserve”, “Wilderness area of Landscape Reserve”, “Wilderness area of National Park”, “Wilderness area of Nature Reserve”*. France has a *“National Park Integral Reserve”* and a *“Forest Biological Reserve”*. Luxembourg has an *“Integral Forest Protection Area”*, and Greece has *“Absolute Nature Reserve Area”, “Absolute nature reserve zone in National Park”* and *“Natural Monuments and landmarks (protected as strict nature reserve)”*. Lithuania has *“State Strict Reserve”*; Portugal has *“Integral Reserve”* and *“Integral Natural Woodland Reserve”* and Spain has *“Integral Nature Reserve”*.

5.4.2 National Parks

The situation with the legislation for Category II National Parks is more straightforward. Thirty eight countries in Europe out of 45 classify protected areas in this category (see Table 5.1) and 37 countries have Category II National Parks in their protected area legislation. Surprisingly, three countries - Azerbaijan, Moldova and Switzerland – that have this type of protected area in their national legislation, do not classify any of their protected areas under the category. Bosnia Herzegovina also has national parks in its legislation, but it was noted earlier that they have removed the classification of their Category I and II protected areas in consideration of their condition (see section 5.2).

Box 5.4 Articles for National Parks in protected area legislation

Spain

Article 30. Parks.

1. Parks are natural areas, that due to the beauty of its landscapes, the representative-ness of ecosystems or the uniqueness of its flora, fauna or geological diversity, including its geomorphological formations, have scientific, educational, aesthetic and ecological values whose conservation deserves priority attention
2. The National Parks are governed by specific legislation.
3. In the Parks the use of natural resources may limited, and in any case prohibited when case incompatible with the objectives that have justified its creation.
4. In the Parks the entry of visitors will be facilitated within the limits necessary to ensure the protection of those rights.
5. Plans will be developed Governing Use and Management, which approval shall be the competent body of the autonomous region. The competent authorities are required to inform planning of those plans before approval.
In these plans, which will be periodically revised, shall be general rules for use and management of the Park.
6. Master plans will take precedence over urban planning. When its findings are inconsistent with the planning regulations in force, it will be reviewed automatically by the competent bodies.

Natural Heritage and Biodiversity Law 42/2007, Spain

Armenia

Article 19. Conservation Regime of the National Park

The conservation regime of the national park in the Republic of Armenia is:

- a) It is prohibited in the reserve zone of the national park:
 1. Any activity disturbing the water regime;
 2. Construction and exploitation of economic and residential objects, roads, pipelines, electrotransmission cables and other communication facilities, except the construction of objects necessary for the operation of the national park (forest guard hut, entanglements, marking signs, etc) and road construction;
 3. Disturbance of conditions of flora and fauna habitats, including loggings and animal grazing;
 4. Introduction and acclimatization activities of new plant and animal species;
 5. The use of plant and animal objects and their products for industrial purposes;
 6. Harvest of plants, flowers and seeds, except the collection of collections envisaged for scientific observations of the reserve's territory;
 7. The use of pesticides for plants' protection, as well as the use of mineral fertilizers;
 8. Geological survey, mining activities and mineral processing, destruction of soil cover, exploitation of ore minerals, ore protuberances and abruptions of stratum;
 9. The traffic of motor or caterpillar transport out of roads of general use and streams and the parking out of the road net or in the places not planned thereof.
- b) It is prohibited in the recreational zone of the national park: 1, 3, 4, 5, 7, 8, 9
- c) It is prohibited in the economic zone of the national park: 1, 3, 4, 7, 8, 9

Law on specially protected natural areas 2006, Armenia

Estonian legislation has national parks in its legislation, and the data provided to the CDDA includes protected areas classified as national parks. However, they are not assigned an IUCN category, and

thus do not show up as Category II National Parks (see Table 5.1). The explanation why this is so is that Estonian national parks are made up from a range of other protected area categories that are nested within the overall boundary of the national park. Thus Soomaa National Park in Estonia is made up of the following protected area types:

- *Strictly protected zone of National Park* (Category Ia)
- *Wilderness area of National Park* (Category Ib)
- *Habitat/species management area of National Park* (Category IV and V)
- *Limited management zone of National Park* (Category VI)

Two examples of the legislation for national parks are given in Box 5.4. That for Spain emphasises the natural value of the area designated, the protection of that natural value through limitation or prohibition of the use of natural resources, and the encouragement of recreation within the capacity of the national park. The example from Armenian legislation demonstrates how zoning of a national park can facilitate different protection regimes, with the greatest prohibition of activity in the *“reserve”* zone, and with reducing lists of prohibitions in the *“recreational”* zone followed by the *“economic”* zone.

National parks are generally the larger land area compare to protected areas in Categories I and III (see Table 5.2). Recreation is often a principal aim of a national park after ecosystem protection, and is an objective of Category II National Parks (see Table 4. 2). Thus this recreational aspect of national parks can be found in the legislation of 24 other countries as well as Armenia and Spain i.e. Belarus, Bosnia Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Georgia, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Moldova, Norway, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland, Turkey, Ukraine. Recreational zones in national parks are also recognised in the legislation of these seven countries: Albania, Austria, Azerbaijan, Bulgaria, Lithuania, Moldova, Ukraine

5.4.3 Natural Monuments

A total of 32 countries classify Category III Natural Monuments (see table 5.1). This is the same number of countries that have this type of protected area in their national legislation (Box 5.5). However, eight countries that have the legislation, do not classify any protected areas under this category (Armenia, Azerbaijan, Georgia, Germany, Hungary, Liechtenstein, Netherlands, Poland) whereas eight countries that do not have the protected area type in their legislation undertake to classify Category III Natural Monuments (Cyprus, Denmark, France, Italy, Malta, Norway, Portugal, Switzerland).

Natural monuments are by far the smallest of the protected areas classified in the IUCN categories, and this is because they are often protective of natural features such as caves, waterfalls and individual geological features such as coastal stacks, all of which have little footprint. Two examples of the legislation for natural monuments are given in Box 5.5. While the example from Bulgaria designates for non-living features, Spain includes living natural monuments, such as single or groups of unique or veteran trees.

Box 5.5 Articles for Natural Monuments in protected area legislation

Albania, Armenia, Austria, Azerbaijan, Belarus, Bosnia Herzegovina, Bulgaria, Croatia, Czech, Estonia, Finland, Georgia, Germany, Greece, Hungary, Iceland, Latvia, Liechtenstein, Macedonia, Moldova, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, Ukraine (32/45)

Bulgaria

Natural Monuments

Article 23

(1) Typical or remarkable non-living natural features, such as rock forms, rock exposures of scientific value, earth pyramids, caves, potholes, waterfalls, fossil beds, mineral occurrences, sand dunes and others of outstanding value because of the inherent rarity, representative or aesthetic qualities thereof or of scientific or cultural significance, shall be designated natural monuments.

(2) Natural monuments shall be managed for the purpose of preservation of the natural features thereof.

(3) Natural monuments shall be designated with an adjoining area as shall be necessary for the conservation thereof.

Article 24

Any activities that may disturb the natural state of natural monuments or impair the aesthetic value thereof shall be prohibited in natural monuments.

Law for the Protected Territories, Bulgaria SG 133, Nov 1998

Spain

Article 33. Natural Monuments.

1. Natural Monuments are spaces or elements of nature consisting mainly of well-known uniqueness, rarity or beauty, that deserve special protection.

2. Also considered as Natural Monuments are unique and monumental trees, the geological formations, paleontological and mineralogical stratotypes and other elements of the natural world having a special interest in the uniqueness or importance of their scientific values, cultural or scenic.

3. In the monuments in generally will be prohibited exploitation of resources, except for reasons of research or conservation, allowed after the appropriate authorisation.

Natural Heritage and Biodiversity Law 42/2007, Spain

5.4.4 Wildland under the IUCN categories of protected areas

From the forgoing analysis, it has been shown that the ability to designate protected areas in IUCN Categories I, II and III is widespread in the legislation for national protected area systems across Europe. The protected area legislation for these categories lays down restrictions on extractive use as well as development as the means to protect "*natural processes*", "*ecosystems*", "*natural state*", "*undisturbed natural development*", "*natural resources*", "*natural areas*", "*natural ecosystems*" or "*biocenosis*", a rich language that while it does not use the word "*wild*", is synonymous with that state of the natural world.

For instance, the term *biocenosis* was coined by Karl Möbius in 1877, and describes a community of biologically integrated and interdependent plants and animals. Möbius was the first to recognise that an ecological system must be taken as a whole, and coined the term "*biocenosis*" for a "*living*

community'. This principle is now established as the basis of general ecology (10) and it would appear also to be the basis for wildland protection in much European protected area legislation, that an ecological system must be taken as a whole and safeguarded.

The greatest restrictions on use occur for Category I protected areas, and it is perhaps in this category that there is some disjunction between the protected area types in the legislation and the detail of the two IUCN categories. No country gives a clear distinction and definitions that conform to both of the two IUCN Categories of " *strict nature reserve/scientific reserve*" (Ia) and " *wilderness areas*" (Ib). No legislation defines a type of protected area for wilderness (discounting the Finnish legislation for Sámi *wilderness*). However, it is incontrovertible that the net result of the definitions for protected areas given this level of greatest protection will be areas that could be recognised as having a wilderness characteristic. That many countries classify for both types of Category I areas suggests that it is in intent and implementation of the protected area type in which the distinctions arise, and would be informed by the detail of the different restrictions available in the legislation to be applied. One basis for distinction would probably be on recreational access, with a probable split between the two different types (Ia and Ib), but the detail of the legislation only confirms this in a few cases.

Whereas wilderness legislation exists in other countries outside of Europe (America, Australia, Canada, New Zealand, South Africa, Sri Lanka, Japan) the overall picture in Europe suggests that separate wilderness legislation is not necessarily required since the existing legislation is capable of being used to designate protected areas of this type.

National parks obviously play a pivotal role in nature recreation across Europe. The protected area legislation for this type repeatedly emphasises this, and provides all the detail (the tools) to make these protected areas fulfil that role. They are perhaps "*Europe's best idea*" as has been dubbed the national parks system in America (11).

The well-established and uniqueness of features, coupled with low land area requirement, make natural monuments a relatively easy way into classifying protected areas in the first three categories. As will be demonstrated in the next Chapter, a number of countries in Europe have recently begun to classify natural monuments, and others have added many new ones.

5.5 Ecological Networks in national protected area legislation

In reviewing the protected area legislation for IUCN categories, it became apparent that 16 countries have incorporated ecological networks into legislation for their national protected area systems (see Box 5.6). While there are a number of high profile trans-national corridor approaches in Europe, this indicates the reach that the concept of ecological networking has gained in a number of European countries. It shows the importance of how these networks join up and contribute to national protected area systems, and provide refuge and migratory routes for wild species.

Thus in Macedonian legislation, an article states that "*a coherent ecological network of special areas of conservation shall be established*" (see Box 5.6). It has a spatial dimension in achieving the aim of contributing to natural balance and biological diversity. A realisation of this approach to ecological corridors in Macedonia is the National Ecological Network in Macedonia (MAK-NEN – see (12)). In an earlier initiative, core nature areas and corridors were mapped from Slovenia to Greece between 2003 and 2006. The MAK – NEN is a three year project that followed on in July 2008 that is mapping ecological corridors and restoration areas inside Macedonia, connecting with the existing core areas and buffer zones, with a focus on providing ecological connectivity for brown bears. The resulting Bear Corridor Management Plan will be a vehicle for:

- a better understanding of the bear's ecological functions;
- gaining better acceptance of its needs; and
- raising the awareness and willingness of key stakeholders to accept the implementation of the Plan

Box 5.6 National Ecological Networks in protected legislation

Ecological Networks in national protected area legislation:

Albania, Armenia, Belgium, Bosnia Herzegovina, Bulgaria, Croatia, Germany, Hungary, Liechtenstein, Lithuania, Luxembourg, Macedonia, Montenegro, Romania, Serbia, Spain (16/45)

Macedonia

Ecological network

Article 53

(1) For the purposes of conservation, maintenance or restoration to a favourable conservation status of the environmentally important areas, a coherent ecological network of special areas of conservation shall be established.

(2) The ecological network shall represent the system of interconnected or spatially close to each other environmentally important areas, which significantly contribute to the protection of the natural balance and the biological diversity through their balanced biogeographical distribution.

Law on Nature Protection, No. 67/2004, Macedonia

Spain

Article 20. Ecological corridors and mountain areas.

The government shall provide in its environmental planning or management plans for Natural Resources, mechanisms to achieve the ecological connectivity of the area, setting or resetting corridors, particularly between the protected areas Natura 2000 and between those natural areas of unique relevance to biodiversity. This will give a priority role to the river courses, drove roads, mountain areas and other parts of the territory, linear and continuous, or act as focal points, regardless of having the status of protected natural areas.

The government guidelines will promote conservation of mountain areas to address at least the scenic, environmental and water in them.

Natural Heritage and Biodiversity Law 42/2007, Spain

In Spain, the focus is on connectivity in mountainous regions, which while it will make use of protected areas, will also make use of linking patterns of linearity or focus in the landscape such as water courses and drove roads (see Box 5.6).

Article 53 in the Hungarian legislation for protected areas gives a definition for an ecological network:

"the biological connections of natural and near-natural areas, protected natural areas and their buffer zones ensured by ecological corridors"

This Article lays down the requirement in Hungary for a National Nature Conservation Master Plan, which among other things will contain the long-term and medium-term aspects of the establishment and maintenance of an ecological network and ecological corridors. A report on the progress of the proposed National Ecological Network shows how the categories of the Pan-European Ecological

Network of core areas, corridors and buffer zones have been used in devising the network (13). The national mapping of the prospective network is available through a web-based viewer (14), and an example of the network elements around the Büki National Park in Hungary is shown in Fig. 5.14.

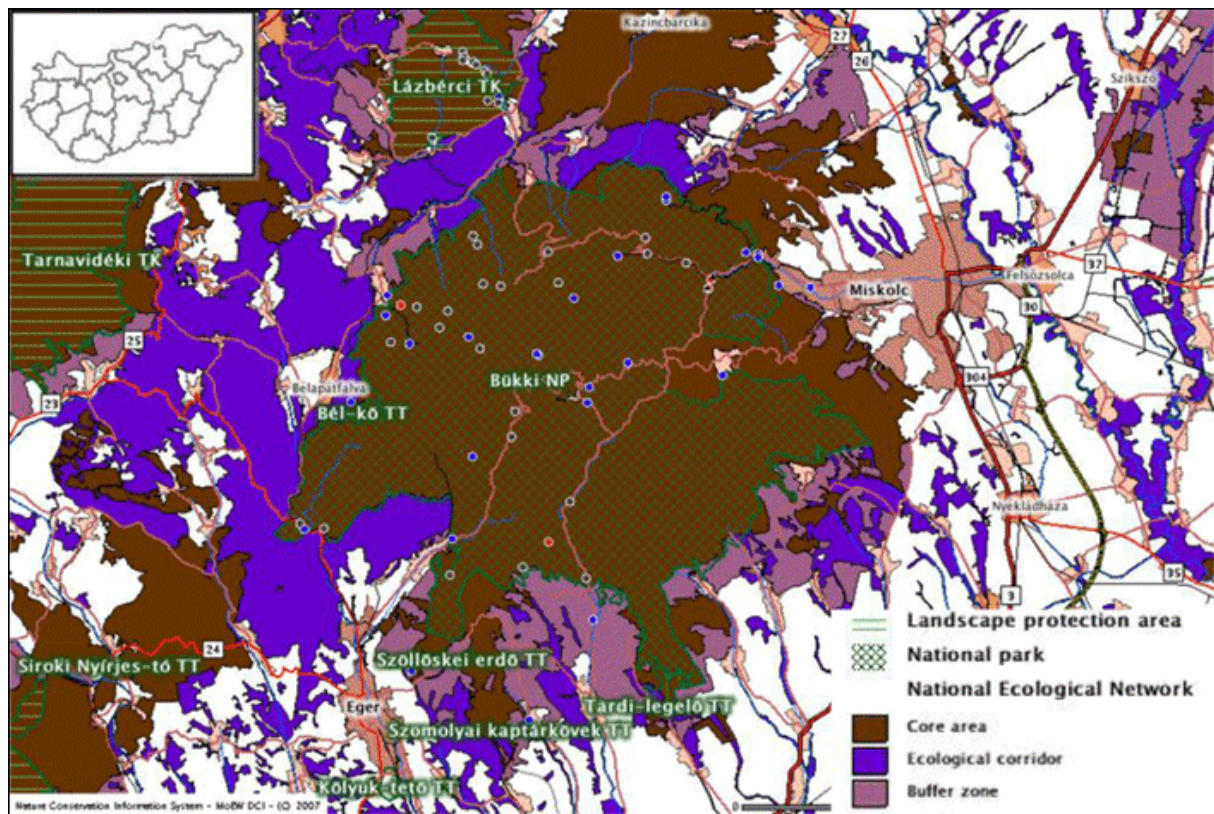


Figure 5.14 National Ecological Network in Hungary

5.6 Trends in State ownership in national protected area systems

Ownership invariably confers rights (see section 4.2), and it is understandable in a situation where the aim is to restrict land use, that the implementation of national protected area systems has relied on having state ownership as a means to ensure that the restrictions are observed. Thus 11 countries in Europe include state ownership in their national legislation for protected areas in Category I and II protected areas (see Box 5.7). Three examples are given from Eastern European countries, where state ownership would have been a principle for many decades. However, there is change in those eastern countries, with the protected area legislation of Belarus only recently being revised to remove the article on the requirement for state ownership.

State ownership can be a national policy, rather than embedded in protected legislation. This is the case for 24 European countries (see Box 5.7) although the legislation in those countries may confer the ability for national authorities to buy land that is needed to continue development of their protected area systems.

Box 5.7 State ownership of National Parks and/or strict reserves in protected area legislation and national policy

State ownership of National Parks and/or strict reserves in protected area legislation:
Armenia, Azerbaijan, Cyprus, Georgia, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, Ukraine (10/45)

Armenia

Article 4. Classification and Status of Specially Protected Natural Areas

Specially Protected Natural Areas in the Republic of Armenia are in State ownership. It is prohibited to transfer the state owned lands of specially protected natural areas to a private ownership.

The Law of the Republic of Armenia on Specially Protected Natural Areas, 2006

Ukraine

Article 4. Ownership of the territory and objects, nature reserve fund Areas of natural reserves, protected areas of biosphere reserves, land and other natural resources provided by National Natural Park, are the property of the Ukrainian people

On Nature Reserve Fund of Ukraine 1992, No. 2456-XII (as amended)

Georgia

Paragraph 12. Property in the Protected Areas

1. Allowable forms of the ownership, governing and use of natural resources in the Protected Areas are being defined according to their categories and territorial-functional zones.

2. The territories of Strict Nature Reserve, National Park, Natural Monument and the Managed Nature Reserve are only of public property. It is forbidden to transfer these territories to physical and legal persons for use, except the Traditional Use Zone of National Park, in rare cases – the separate districts of Managed Nature Reserve and the cases foreseen by the article 21 of this paragraph. Nomad wild animals in the mentioned territories are also of public property.

Law of Georgia about the System of Protected Areas 1996

State ownership of National Parks and/or strict reserves as a national policy:

Albania, Austria, Belarus, Belgium, Bulgaria, Czech, Denmark, Estonia, Finland, France, Georgia, Italy, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Sweden, Switzerland, Turkey (24/44)

The CDDA database on protected areas contains information of the date of first designation for each site, and many date from the first half of the 20th century – thus Sweden is credited with the first designation of a national park in Europe when the Swedish Parliament passed a law on national parks in 1909, and nine were designated that same year (15). A further seven parks were established between 1918 and 1962, followed by twelve more between 1982 and 2002.

It is likely that in any country in Europe that seeks now to expand its protected area system in IUCN Categories I and II, and which has little resource of state-owned land, that they may have to embrace a mix of public and privately owned land to achieve that expansion, and with management agreements with the private land owners. That this already happens is given example by the National Parks in Austria (16), which exhibit private ownership in the range of 0-100% - see Table 5.3. Austrian National Parks are divided into a strict protection zone without any economic use or human intervention, usually referred to as the “*natural zone*” (17). The remainder of the national park constitutes a “*conservation zone*” where management is allowed as long as it is not in conflict with

the goals of the national park. The proportion of each of the national parks in the natural zone is also given in Table 5.3. The lack of correlation between ownership and the proportion of that zone indicates that private ownership is not necessarily a barrier to achieving the aims of a national park.

National parks in Austria are regarded as their models of nature conservation and environmental protection, and act as demonstration projects in their respective regions. Their success is attributed to the principles underlying their development (18):

- Voluntary agreement of land owners
- Adequate compensation for economic disadvantages
- Adherence to international criteria as defined by IUCN in the Protected Area Management Category II of *"national parks"*

| National Park | Private ownership % | Natural Zone % |
|---------------|---------------------|----------------|
| Neusiedlersee | 100 | 88 |
| Thayatal | 95 | 86 |
| Hohe Tauern | 62 | 65 |
| Kalkalpen | 12 | 89 |
| Gesaeuse | 1 | 48 |
| Donau Auen | 0 | 93 |

Table 5.3 Proportion of private ownership and of the Natural Zone in Austrian National Parks

The national park areas must be secured by legal regulations such as purchase, lease or environmental stewardship subsidy based on long-term contracts. Adequate compensation is paid for the forfeiture of yield from uses and economic losses. The original scepticism shown by the local population and communities has given way to a broad acceptance, with a trend towards expanding the national parks.

Another example of the mix between public and private ownership would be the Kemer National Park in Latvia, in which 77.3% of the land belongs to the State, and 17.6% is in the possession of local governments and private owners (19). Like the Austrian National Parks, Kemer is divided into a number of functional zones, such as nature reserve, nature protection, landscape protection and neutral zone. In the nature reserve zone, all the economic activities are prohibited, and it can only be crossed on specified routes approved and allowed by the administration of the park. The other zones have fewer restrictions.

State ownership of protected areas, wholly or partially, implies that there is a level of state administration and funding through a national protected area system that is responsible at agency, department or ministry level. That this is so is shown by such as the National Parks and Wildlife Service, part of the Department of Environment, Heritage and Local Government in Ireland (20) and the Agency of Protected Areas in the Ministry of Environment and Natural Resources of Georgia (21).

5.7 Summary

Wildland is closely associated across Europe with protected areas classified under IUCN Categories I, II and III. Only the UK, amongst 45 countries across Europe, does not have any protected areas classified in those categories.

The ability to designate protected areas in IUCN Categories I, II and III is widespread in the legislation for national protected area systems across Europe. The protected area legislation for these

categories lays down restrictions on extractive use, as well as development, as the means to protect wild land.

Wilderness or wildland is not often found in European legislation because of the tendency for different languages to have their own words (*sauvage, wildnis, salvaje, vildmarken* etc). However, the language of protected area legislation in Europe is rich in defining and describing natural processes, dynamic and functioning ecosystems, and protecting these from extractive activities, the basis for legislation for wilderness and wildland under the IUCN guidance. The EU resolution and Prague conference is moving forward the use of wilderness and wildland as commonly used descriptive terms in Europe, as well as giving them definition (see section 3.4) but it remains to be seen whether these anglicised words will be acceptable if they aren't immediately translatable or if they displace strongly associated words in other languages.

As well as providing a basis for designation of protected areas, a number of countries include articles on ecological networks in their protected area legislation. These provide a level of spatial coherence to national systems of protected areas through linkage of protected wildland areas - *biological connections ensured by ecological corridors* – and which can then be integrated with the wider bioregional context through cross-border initiatives.

State ownership of wildland protected areas is either a legislative principle or recognised in the national policy of three quarters of the countries across Europe. This represents considerable forethought by these countries in securing the land into public ownership, as well as putting in place national and regional systems of governance (administration, funding etc) for their wildland systems. The obvious benefit of state ownership is the unencumbered ability to realise the legislated intent of a protected area system for wildland that is based on the exclusion of extractive activities. That is not to say that private ownership is necessarily inimical to wildland protected areas, but there must be a basis for agreement with private owners for compliance with the restrictions on extractive activity that meet the objectives of the protected area.

CHAPTER 6 ISSUES AND IMPLEMENTATION OF WILDLAND IN EUROPE

The applicability of IUCN Categories I, II and III as a means to identify wildland in Europe was explored in the previous chapter, as well as the legislation that is used in designation of protected areas under those categories in national systems of protected areas. This chapter looks at some of the broader issues about wildland designation and protection in Europe; the influence that classification under the IUCN categories brings; a look at the spatial implementation of protected areas; and a look at a unifying system of wilderness designation across Europe.

6.1 How much wildland is there in Europe, and where?

The area of wildland in Europe, based on the protected areas classified under Categories I, II and III is 1.9% of the total land area, or 459,019 square kilometres (see Table 6.1c). This is a shortfall in the area that could be designated for wildland characteristic, as can be seen when the top 10% WQI is overlaid onto the wildland continuum (see Fig. 6.1). By visual inspection, it would seem that the top 10% WQI is easily accommodated. This shortfall is particularly notable in perhaps the Scandinavian countries where a greater proportion of their overall land area is found with higher WQI.

The non-EU states across Europe contain most of the wildland based on the IUCN Categories (77.8% - see Table 6.1c) the greatest amounts being found in Russia and Norway, and with Iceland and Turkey contributing the next largest amounts (see Table 5.2). By comparison, EU member states have 15.5% and the recent accession states added a further 6.73% (Table 6.1a&b). The proportion of land area in these three groupings designated for wildland is similar in each case (1.8% to 2.8%) mirroring the fact that the area contributed by each of the groupings to the total land area is similar to the proportion of wildland contributed (81.9%, 13.5%, 4.5%).

It had been expected that there may have been a significant difference in the amount of wildland between the earlier members of the EU and the recent accession states. This was based on a visual inspection of the top 10% WQI mapping that shows substantial areas in Bulgaria, Estonia, Latvia, Poland, Romania, Slovenia and Slovakia (see Fig 6.1). While, proportionately, they brought no more designated wildland than would be expected from any other area in Europe, it is interesting to note that there is double the proportion of land classified under Categories Ia and Ib in the recent accession states compared to the earlier members (0.7% versus 0.3% - see Tables 6.1a and b). It is slightly higher in non-EU states where the proportion of land classified under Categories Ia and Ib is 1.0% (Table 1c). Thus there would appear to be a trend where more land in the peripheries of Europe is classified in Category I than it is in national parks and natural monuments (the latter contribute less than 4% to the combined area). There appears no obvious explanation for this trend.

It is also interesting to note that of the 15 countries in EU membership by 1995, only five (33%) have legislation now that reflects the IUCN Categories (Austria, Germany, Portugal, Spain, Sweden) whereas for the recent accession states it is nine of the 12 (75%), and for non-EU member states it is 14 out of 18 (78%). (See Box 5.1 for a listing of the countries).

While the recent accession states have not brought a difference to the proportion of designated wildland in the EU, it has in contrast brought a difference to the accession states in the way they have to consider their protected area systems. This is because of the requirement of EU member states to designate Natura 2000 sites for habitats and species, and to report on their condition. The implications for the wildland of these accessions states, and for the rest of the EU membership, is discussed in the next section.

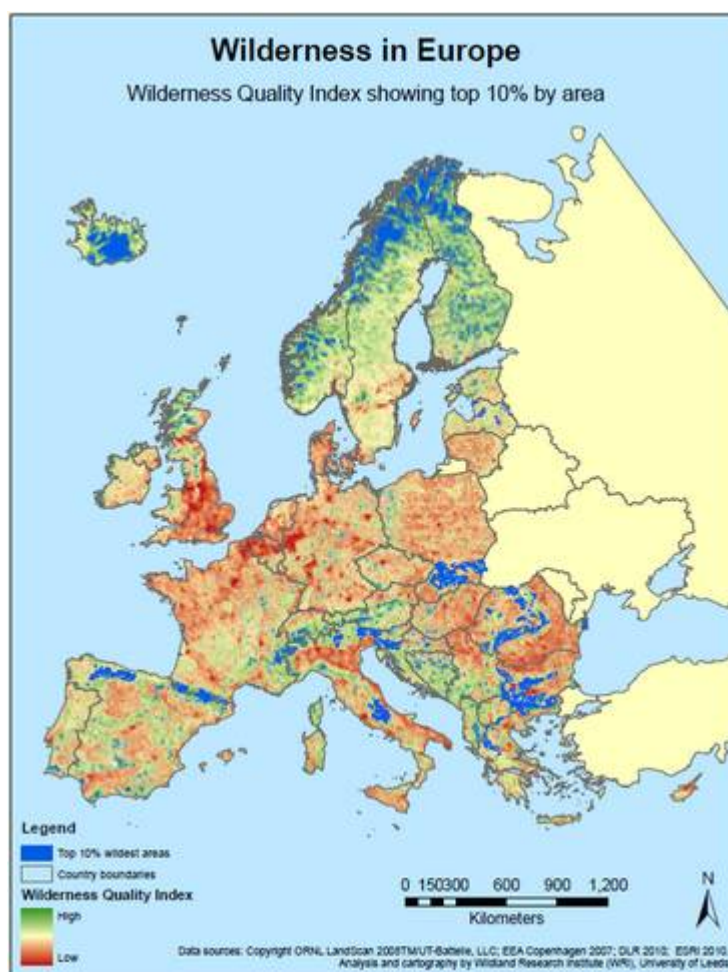


Figure 6.1 Top 10% WQI in Europe

| | Year joined EU | Area (ha) for IUCN Categories | | | Country area (sq.km.) | % area I, II and III |
|--|-------------------|-------------------------------|------------|---------------|--------------------------|-------------------------|
| | | I | II and III | I, II and III | | |
| Belgium | 1957 | | 306,971 | 306,971 | 30,528 | 10.1 |
| France | 1957 | 6,123 | 263,290 | 269,413 | 550,000 | 0.5 |
| Germany | 1957 | | 962,326 | 962,326 | 356,854 | 2.7 |
| Italy | 1957 | 60,985 | 1,416,593 | 1,477,578 | 301,263 | 4.9 |
| Luxembourg | 1957 | 3,511 | 51,807 | 55,318 | 2,586 | 21.4 |
| Netherlands | 1957 | | 135,305 | 135,305 | 41,526 | 3.3 |
| Denmark | 1973 | 16,327 | 20,594 | 36,921 | 43,094 | 0.9 |
| Ireland | 1973 | 20,929 | 59,171 | 80,100 | 70,000 | 1.1 |
| UK | 1973 | | | | 244,820 | 0.0 |
| Greece | 1981 | 3,495 | 119,111 | 122,606 | 131,957 | 0.9 |
| Portugal | 1986 | 33,271 | 76,856 | 110,127 | 92,072 | 1.2 |
| Spain | 1986 | 47,475 | 938,600 | 986,075 | 504,782 | 2.0 |
| Austria | 1995 | 1,133 | 97,172 | 98,305 | 83,870 | 1.2 |
| Finland | 1995 | 287,863 | 885,251 | 1,173,114 | 338,000 | 3.5 |
| Sweden | 1995 | 553,795 | 733,358 | 1,287,153 | 449,964 | 2.9 |
| Total area of type in group | | 1034907 | 6,066,405 | 7,101,312 | 3,241,316 | 13.5 |
| % of total area in group | | 0.3 | 1.9 | 2.2 | | |
| % of total area of I, II and III in Europe | | | | 15.5 | | |

Table 6.1a The early EU members – analysis of category I, II and III protected areas

| | Year Joined EU | Area (ha) for IUCN Categories | | | Country area (sq.km.) | % area I, II and III |
|--|-------------------|-------------------------------|------------|---------------|--------------------------|-------------------------|
| | | I | II and III | I, II and III | | |
| Cyprus | 2004 | 27,215 | 16,525 | 43,740 | 9,250 | 4.7 |
| Czech | 2004 | 17,227 | 243,303 | 260,530 | 78,866 | 3.3 |
| Estonia | 2004 | 203,881 | 264 | 204,145 | 45,000 | 4.5 |
| Hungary | 2004 | | 220,318 | 220,318 | 93,000 | 2.4 |
| Latvia | 2004 | 24,439 | 410,988 | 435,427 | 65,000 | 6.7 |
| Lithuania | 2004 | 37,068 | 156,949 | 194,017 | 65,000 | 3.0 |
| Malta | 2004 | 7,741 | 680 | 8,421 | 316 | 26.6 |
| Poland | 2004 | 1,995 | 203,120 | 205,115 | 312,679 | 0.7 |
| Slovakia | 2004 | 96,328 | 319,506 | 415,834 | 48,845 | 8.5 |
| Slovenia | 2004 | 7,206 | 98,896 | 106,102 | 20,273 | 5.2 |
| Bulgaria | 2007 | 77,016 | 274,002 | 351,018 | 111,910 | 3.1 |
| Romania | 2007 | 310,232 | 328,521 | 638,753 | 237,500 | 2.7 |
| Total area of type in group | | 810,348 | 2,273,072 | 3,083,420 | 1,087,639 | 4.5 |
| % of total area of type in group | | 0.7 | 2.1 | 2.8 | | |
| % of total area of I, II and III in Europe | | | | 6.7 | | |

Table 6.1b The recent accession EU members – analysis of category I, II and III protected areas

| | Area (ha) for IUCN Categories | | | Country area (sq.km.) | % area I, II and III |
|--|-------------------------------|------------|---------------|--------------------------|-------------------------|
| | I | II and III | I, II and III | | |
| Albania | 4,800 | 25,430 | 30,230 | 28,748 | 1.1 |
| Armenia | 102,685 | 178,002 | 280,687 | 29,743 | 9.4 |
| Azerbaijan | 196,464 | | 196,464 | 86,600 | 2.3 |
| Belarus | 81,023 | 159,097 | 240,120 | 207,600 | 1.2 |
| Bosnia Herzegovina | | 2,003 | 2,003 | 51,209 | 0.0 |
| Croatia | 36,201 | 19,553 | 55,754 | 56,542 | 1.0 |
| Georgia | 188,559 | 71,849 | 260,408 | 69,700 | 3.7 |
| Iceland | 7,968 | 1,132,129 | 1,140,097 | 103,000 | 11.1 |
| Liechtenstein | 1,307 | | 1,307 | 160 | 8.2 |
| Macedonia | 12,855 | 181,377 | 194,232 | 25,433 | 7.6 |
| Moldova | 19,378 | 1,184 | 20,562 | 33,843 | 0.6 |
| Montenegro | | 85,500 | 85,500 | 13,810 | 6.2 |
| Norway | 617,096 | 2,681,115 | 3,298,211 | 323,802 | 10.2 |
| Russia | 17,240,685 | 11,024,313 | 28,264,998 | 17,075,200 | 1.7 |
| Serbia | 196 | 65,468 | 65,664 | 77,474 | 0.8 |
| Switzerland | 17,032 | 124,065 | 141,097 | 41,290 | 3.4 |
| Turkey | 108,086 | 846,074 | 954,160 | 780,580 | 1.2 |
| Ukraine | 441,249 | 129,928 | 571,177 | 603,700 | 0.9 |
| Total area of type in group | 19,075,584 | 16,727,087 | 35,802,671 | 19,669,884 | 81.9 |
| % of total area in group | 1.0 | 0.8 | 1.8 | | |
| % of total area of I, II and III in Europe | | | 77.8 | | |

| | | | | |
|---------------------------------------|------------|------------|------------|------------|
| Total area of each type in all Europe | 20,920,839 | 25,066,564 | 45,987,403 | 23,923,579 |
| %of area protected in all Europe | 0.87 | 1.03 | 1.9 | |

Table 6.1c Non-EU members – analysis of category I, II and III protected areas

6.2 Wild places and the Natura 2000 system

As noted in section 5.6, Sweden is credited with the first designation of a national park in Europe when the Swedish Parliament passed a law on national parks in 1909, and nine were designated that year - Abisko National Park is one of those, well known for its mountain flora (1). Lagodekhi Strict Nature Reserve in Georgia was created in 1912 (2), the Swiss National Park followed soon after in 1914 (3) and the protection of the Alpine Conservation Park of Slovenia, now known as the Triglav National Park, dates from 1924 (4). In Malta, the Bidnija (Zebbug Antik) protected area is an early example of a natural monument, this area of "*Historical Trees Having an Antiquarian Importance*" being designated under the Antiquities Protection Act, Act XI of 1925 (5).

These few examples illustrate that areas protected under national systems have existed for many decades before there were any trans-national systems of classifying them. It is a testament to the wisdom of nations in Europe that they identified those wild places, knowing where their wildland was, and that they put in place legislation and other systems that recognised their value and gave it protection. In a very real sense, the development of the IUCN system of categories for protected areas was based on the national protected area systems existing around the world, and is representative of this area-based approach to protection rather than to individual species or habitats. The aims of Categories Ia and Ib in particular are to safeguard a characteristic of wildness through restrictions on extractive activity within a protected area, and thus it is not surprising that 99% of protected areas in that classification can be found within the top 10% WQI of the wildland continuum.

As was noted in the previous section, nine of the 12 recent accession countries to EU membership have national systems of protected area legislation based on the approach of the IUCN categories. Since accession, these countries have been required to incorporate the Birds and Habitats Directives into their national legislation (6), and will have begun to designate protected areas under the Natura 2000 system based on the habitats (Annex I) and species (Annex II) that are considered to have European priority rather than national priority.

In implementing the Natura 2000 system, it was recognised that the vegetation, climate and geology, and thus native species (where they were still extant), varies greatly across Europe. Thus it could not be the case that every member state would be able to contribute to the conservation of all species and habitats judged to be of European priority. Instead, Europe was divided into a range of biogeographical regions, each one having their lists of regionally distinct species and habitats that were to be protected under the Natura 2000 system (7).

Prior to the 10 new member states that joined in 2004, there were six regions, Continental, Mediterranean, Alpine, Atlantic, Macaronesian and Boreal, with the UK placed in the Atlantic region alongside Ireland and the Netherlands, and with parts as well of France, Belgium, Germany, Netherlands, Denmark, Spain and Portugal. The accession of the Czech Republic, Hungary, Romania and Slovakia amongst the 10 new members in 2007, brought with them new native species and habitats requiring an additional region to be added – the Pannionian region. Bulgaria and Romania joined in 2007, requiring the addition of the Black Sea and the Steppic regions, making a total of nine regions overall (8). A map of the biogeographical regions is given in Fig. 6.2.

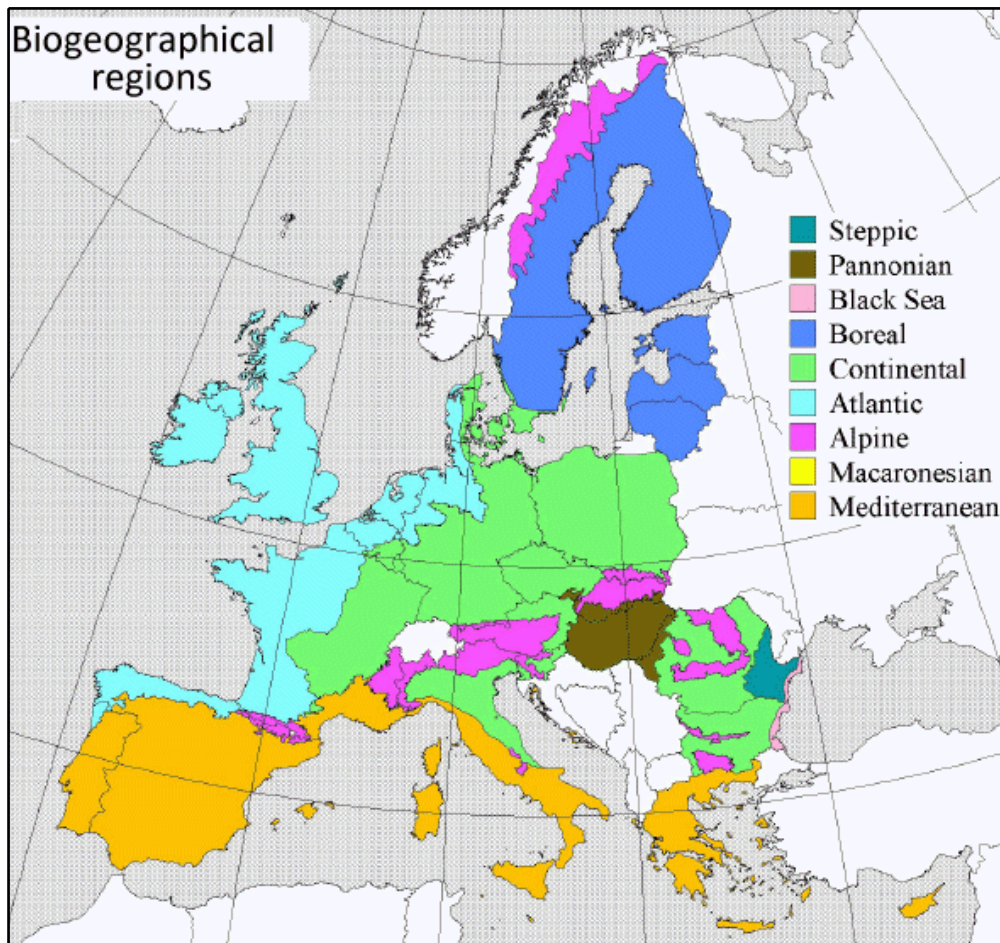


Figure 6.2 Biogeographical regions of Europe

The Natura 2000 system takes an individual species and habitats approach to protected areas, rather than an area approach of protecting natural processes. Thus the purpose of Natura 2000 sites is not based on encompassing and maintaining whole, functioning ecosystems, such as is the objective of national parks classified under the IUCN categories (see Table 4.2). There is overlap between protected areas classified under IUCN Categories I and II and designations for Natura 2000 sites but, as was identified in section 5.1, there is a poor correlation between Natura 2000 sites and higher WQI in the wildland continuum. To be more specific, only about 14% of the top 10% WQI of the wildland continuum overlaps with Natura 2000 sites. The new or amended protected area legislation of a number of countries within the EU now also contains incorporation of legislation for the Natura 2000 system. However, that the Natura 2000 and IUCN systems are considered to be different by national protection agencies is demonstrated by the fact that none of the EU members report Natura 2000 sites to the CCDAs as a protected area type and classified in one of the IUCN categories.

That there is overlap between Natura 2000 sites and protected areas classified under Categories I and II is given likelihood because of the coincidence of Natura 2000 sites for keystone species in Annex II with high WQI (see section 5.1). A report on the status and monitoring of some of these keystone species in the Natura 2000 network emphasised that they were *"wilderness dependent species"*. These species were divided into two groups in the report: some are strictly dependent on certain specific features in wildland such as the micro-habitats in old growth, primary forests with decaying wood, while others are only able to survive in wildland areas if they are sufficiently large enough, undisturbed areas and with a fully functioning ecosystem to rely on (9).

The habitat type of Natura 2000 sites that might support the wilderness dependent species were identified in the report, in the core areas of a number of national parks known to support brown bear, lynx or wolf, including Central Balkan National Park in Bulgaria, Kalkalpen National Park in Austria, Tatra National Park in Slovakia, and the Bavarian Forest National Park in Germany (10). These core areas are predominantly made up of forest habitats in which no management intervention is required.

The Natura 2000 habitat types were also identified in the core areas of Oulanka National Park in Finland, Fulufjället National Park in Sweden and Soomaa National Park in Estonia, on the basis that the management plans for these core areas also specified non-intervention. The habitats in these national parks are fens, mires, bogs, bog woodland, heaths, ponds and lakes, indicating that it is not only forest habitats that are stable without management intervention.

In the report of her presentation to the conference Europe's Wild Heart, Dr Sandra Balzer of the Federal Nature Protection Agency, noted that the habitat types in Germany that needed little intervention to maintain their status are the Wadden Sea, marine areas, rocks and screes, forests, bogs and fens, large water bodies and streams. She noted that most of the forest habitat types and species are capable under non-intervention management to reach favourable conservation status, but that there were Natura 2000 forest habitat types designated in Germany that had arisen through historical management, and would thus need regular intervention to ensure conservation status (11).

The distinction is thus between *Primary*, substantially unmodified habitats that the dynamic forces of nature are able to maintain, compared to *Secondary* habitats arising through human management and use of land, and their continued existence is dependent on that. There is, as yet, no definitive list of what constitutes a primary or secondary habitat amongst the habitat types in Annex I of the Habitats Directive. Moreover, it is likely that a habitat type that could be considered a primary habitat in one biogeographical region, may be a secondary habitat in another biogeographical region as it requires management intervention to maintain it.

Thus if grazing was removed from natural alpine meadows, such as in the Rackova Valley at about 1550 - 1600m above sea level in the Western Tatra Mountains of Slovakia, there may be some change in the species composition of meadow plants, but it would remain a natural meadow at this altitude, which is above the tree-line. However, if grazing is stopped on near-alpine meadows created as secondary habitats by farming, then the consequence will be natural forest regeneration, with the plants replaced by shrubs and trees (12).

It may also be the case that while the Natura 2000 sites for Alpine and Boreal Heath are likely to be primary habitats in the Alpine and the Boreal biogeographical regions, they are more likely to be secondary habitats in the Atlantic biogeographical region.

Another way to approach the issue of identifying primary habitat in the Natura 2000 system is based on deduction of what habitat exists in some EU-member states within closely biogeographical regions, but which there is no apparent ecological reason why it is not found in all of them. An example of this is:

91F0 - Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers

Natura 2000 sites for this habitat can be found in Belgium, Germany, France and the Netherlands in the Atlantic biogeographical region, and in Austria, Bulgaria, Czech Republic, Italy, Poland, Romania, Slovenia and Sweden in the nearby Continental biogeographical region. However, they are not found in either the UK or the Republic of Ireland.

An enquiry to Natural England about this woodland type drew the response that when drawing up potential woodland Natura 2000 sites for England, it was concluded that there were no recognisable stands of this habitat type except possibly in the New Forest, but that those areas had already been included in another, very common habitat type:

*91E0 – Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior**

It was suspected that 91F0 is a type of riparian woodland that may once have occurred quite widely in the lowlands of England, probably along the Trent, Ouse and Thames Rivers, but was cleared away for agriculture even more efficiently than woodland at the tree-line level in the uplands (13). In the rest of Europe, it would perhaps appear to be a good indicator of a lowland primary habitat.

A number of conclusions can be drawn from this analysis, and which have relevance to the relationship between wildland, the IUCN and Natura 2000 systems of protected areas:

- The Natura 2000 system does not act as a driver for wildland because it does not define the conditions for a “*strict nature reserve*” and thus has no legislative force similar to the IUCN inspired, national protected area systems legislations.
- Management plans for Natura 2000 sites are not statutory, whereas they often are for nationally protected areas. Management plans for nationally protected sites can specify zones of different activity/management level and can include non-intervention areas.
- Where there are keystone species and stable, primary habitats in continental Europe, the Natura 2000 and IUCN systems are complementary and the former may not be a threat to wildland, or a bar on the aspiration and development of wildland under the latter.
- It is important that the Natura 2000 system recognises that natural disturbance is a key factor in primary habitats, and thus there will be fluctuations in condition (in forests, blowdowns can occur or beetle infestation) that should not incur default in the reporting system for Natura 2000 sites.
- The distribution of Natura 2000 sites for keystone species reflects, without exception, the Annex II species lists of the different Biogeographical regions, which would appear to have been based on current distribution rather than the historical range. This therefore doesn't recognise the potential for re-introduction to former ranges as a driver for wildland, but presumably the biogeographical list will have to be updated after successful re-introductions such as the beaver in Scotland (14) and bison in Spain (15)
- In areas that lack keystone species and where there is a preponderance of secondary habitats, then a contention may arise between the aspiration and intent of an area protected under an IUCN-inspired national protected area system with the requirement for management intervention to maintain and report on the condition of the habitat and species of the Natura 2000 designation.
- Protected areas arising from national legislation and classified under IUCN categories are recognition of national conservation priorities, whereas these may not be the same as the priorities of the Natura 2000 system.

At its simplest, a secondary habitat designated under the Natura 2000 system would need that designation removed if there was an aspiration for the protected area to take on more of the characteristic of wildland. This has implications for the development of the Guidelines for the management of wilderness and wild areas in Natura 2000 that were discussed in section 2.5.

6.3 An aspirational protected area system for wildland across Europe

Recent national reporting for protected areas shows a greater coverage by using more of the categories, as well as an up-rating of protected areas. This provides evidence of wide-scale adoption of the system, and its potential as a means of redefining protected areas across continental Europe. There is an element of up-rating as well in the aims for developing protected areas towards the 75% rule for IUCN Category II of removing extractive activities, and moving past it. Policies and biodiversity strategies also show a trend of increasing the area covered by national protected area systems through designation of new parks and wilderness.

6.3.1 Classification by IUCN categories is aspirational for national protected area systems

It was noted in section 5.2 that Belgium is in the top 10 countries by proportion of area covered by protection under IUCN Categories I, II and III, as well as being amongst the 10 countries with the smallest areas in Europe. This was surprising given that the WQI for that country would not suggest that such a proportion of its land is wild (see Fig 5.1). The high proportion derives from the combined areas of the nine Category II National Parks that Belgium reported to Version 8 (2009) of the CDDA dataset. This categorisation was at odds with that shown on the WDPA database, which appears to be based on an earlier data version of the CDDA dataset.

In tracing back to the CDDA dataset for 2004 (Version 3.2 (16)) it was found that Belgium reported no protected areas under Category II. However, Parc Natural Hautes Fagnes-Eifel and Parc Natural des Vallées de la Burdinale et de la Meuse, two of the protected areas listed as Category II National Parks in 2009, were reported in 2004 under Category V protected landscapes, as was shown in the WDPA data. This re-rating by Belgium of two protected areas, plus the reporting of more areas classified as Category II National Parks, suggested that there may be an aspirational dimension to the IUCN system for classification that encourages countries to develop their existing protected areas to meet higher objectives.

Since it was reported that 34 countries had updated their information on legislative instruments, sites and site boundaries for Version 8 of the CDDA, a comparison was made with that dataset and the dataset from 2004 as a test of this aspirational element. Differences in reporting were found for 16 of 44 European countries in categories I, II and III. Some countries had increased the number of protected areas in Categories I, II and III, whereas others had reported protected areas in one of those categories for the first time. The data is shown in Table 6.2.

Some of the changes since 2004 are surprisingly large, such as the large increase in Category Ia protected areas in Estonia, Norway, Sweden and Turkey, the increase in Category II National Parks in Italy, Norway, Spain and Turkey, and the large increase in Category III Natural monuments in Estonia and Slovenia.

The case of Spain is similar to that of Belgium in that for example Parc Natural de las Nieves was classified under Category V in 2004, and is a Category II National Park in 2009. On the other hand, France is classifying its Forest Biological Reserves under Category Ia, when these were not classified under any IUCN Category in 2004. Ireland is also reporting Category Ia protected areas for the first time, their National Nature Reserves going from IUCN IV in 2004 to IUCN Ia in 2009. Liechtenstein, Luxembourg and Slovenia have also classified protected areas as IUCN Categories Ia or Ib for the first time.

Of interest is that Norway, Spain and Switzerland have now begun to designate Natural Monuments (IUCN III). This category is for protected areas with natural geological and geomorphological features,

such as waterfalls, cliffs, craters, caves, fossil beds, sand dunes, rock forms, valleys and marine features such as sea mounts or coral formations, but may also be for significant forest groves. The emphasis of Category III management is thus not on protection of whole ecosystems, but of particular natural features. However, while Category III protected areas are usually small, some may require protection of a larger ecosystem to survive – for example a waterfall may require protection of a whole watershed to maintain its flow (17).

This category can be used where protection of a cultural site also protects significant natural interest, such as archaeological/historical sites that are inextricably linked to a natural area. However, even in that circumstance, the management practices applied would probably focus more on strict protection of the natural feature.

It should be considered that important natural monuments can sometimes provide an incentive for protection and an opportunity for environmental/cultural education even in areas where other forms of protection are resisted due to population or development pressure. Category III protected areas can preserve samples of natural habitat in otherwise cultural or fragmented landscapes, and could thus be a very important stepping stone into classifying in new categories of the IUCN system.

| | IUCN Category | | |
|---------------|---------------|-----|-------|
| | I | II | III |
| Belgium | | 9* | |
| Czech | 7 | 2 | 221 |
| Estonia | 603 | | 1,109 |
| France | 37* | | |
| Ireland | 75* | | |
| Italy | 109 | 10 | 30 |
| Liechtenstein | 9* | | |
| Luxembourg | 34* | 2* | |
| Malta | 19 | 2 | 10 |
| Norway | 1786 | 19 | 91* |
| Portugal | 18 | | 20 |
| Slovenia | 56* | | 1,151 |
| Spain | 20 | 51 | 189* |
| Sweden | 1,215 | | |
| Switzerland | | | 25* |
| Turkey | 510 | 325 | 140 |

Table 6.2 Increase in Category I, II and III protected areas since 2004. * indicates reporting in this category for the first time

6.3.2 The 75 Percent Rule

In drawing up the guidelines for applying the categories, the IUCN recognised that there may be reasons why the whole of a particular protected area may not be able to comply with the objectives of the category. At its simplest, the infrastructure to support recreation in national parks would mean that buildings and roads would be present. In other cases, there may be an aspect of a cultural landscape that is considered important to conserve, and the active management needed for that would contrast with the minimal or non-intervention of other areas. Thus the guidelines recommend that up to 25 percent within a protected area can be managed for other purposes so long as they are compatible with the primary objective of the protected area (17).

In practice, countries have classified their protected areas in the category that they aspired to, and have then had a developmental phase until the primary management objective applies to at least three-quarters of the protected area. This is the case for Austrian National Parks. In 1981 Austria's first National Park was established with part of the Hohe Tauern National Park in the province of Carinthia. The last, Gesäuse, was founded in 2002. At the start, most Austrian National Parks were confronted with the conflicting priorities of nature conservation and economic exploitation. However, with the cooperation of environmental organisations, the local population and political decision-makers, the idea of protection eventually prevailed. That protection was based on renouncing any economic utilisation on at least 75% of the national park area. In section 5.6 it was noted that state ownership of the park areas varied from 0-100%, and thus agreements with private land owners would be essential if this condition could be obtained. It was reported in 2008 that all six Austrian National Parks have achieved that objective (18).

Most of Germany's National Parks are still in the development phase, since they only partly meet the criteria of 75% of their area that leaves nature untouched (19). German National Parks are zoned to demarcate different activities, with a core zone, development and management zones, and some have a recreation zone. As of April 2010, Hamburg Wadden Sea, Jasmund, Hainich, Kellerwald-Edersee National Parks have achieved that criterion, Bavarian Forest, Berchtesgaden and Lower Saxony Wadden Sea National Parks are getting close, but the rest have some way to go. Thus measures are being implemented in the management plans of these latter parks over the next two to three decades that will allow dynamic natural processes to be given priority in most of the territory covered by the parks.

6.3.3 New national parks

A number of countries across Europe have ongoing programs of developing new national parks. Thus, for example, the first national park was established in Georgia - Borjomi-Kharagauli - in 1955. Kolkheti National Park followed in 1998, Tusheti and Vashlovani National Parks came in 2003, and then there was Mtskheta National Park in 2006. Forward planning in Georgia's national protected areas system looked to establish five more National Parks in Georgia. Thus Tbilisi, Kazbegi and Algeti National Parks followed in 2007, with two more to go (20).

Denmark has started on a program of new national park development after enactment of a Law on National Parks in 2007. In familiar terms, the Act's purpose is the formation of national parks to:

- create and ensure more coherent natural areas that maintain and enhance the quality and diversity of nature
- ensure continuity and opportunities for a free dynamic in nature
- promote people's opportunities to use and experience nature and the landscape.

The establishment of a network of new national parks began shortly afterwards, with Thy National Park being the first in August 2008. Mols Bjerge was the next in August 2009. Three more areas have been selected - Skjern Å, Vadehavet (Wadden Sea) and Kongernes Nordsjælland – with these parks being established step by step over the next few years under the condition that public consent in the locality is secured (21). Each national park is established by a designation order that determines the boundary and sets up the objective and goals for the development of the park. The parks are governed by a National Park Board, which has the task to draw up and implement a National Park plan.

In the summer of 2007, the French President launched *le Grenelle Environnement* where State and civil society combined between July and October in public debate, workshops and roundtable discussions to define the key points of public policy on ecology and sustainable development, and to develop a five-year roadmap for the future. Government, local authorities, trade unions, business and voluntary sectors, were all involved and the outcome was to set ambitious goals that included (22)

- Creating a green belt network (green corridors) and a blue belt network (waterways and bodies of water, together with surrounding areas of vegetation).
- Develop a national strategy on protected areas and open 3 new national parks.

These two goals were subsequently incorporated into the action plan of the national strategy for biodiversity, evidence of the power of the process when ordinary people are involved (23).

“Action

1-1 Protect key elements of the national ecological network

1.1.4 - Complete the network of 9 national parks through the creation of three new national parks: Mediterranean, lowland hardwood forest, wetland”

6.3.4 New wilderness

In 2007, Germany brought out a National Strategy on Biological Diversity that put wilderness at the centre of its aspirations for protected areas (24):

“Over the past centuries, attempts have been made to largely suppress the natural dynamic that is typical of wilderness areas. Among other things, this has led to the virtual disappearance of wilderness dependent habitats (pioneer biotopes, intact riparian forests etc.) from the landscape. In order to reactivate the natural processes of habitat momentum, a certain proportion of Germany’s territory must be exempted from human influence”

Germany would aspire to creating a system of interlinking biotopes in the mountains of the German Alps and Central Uplands. They recognised that wilderness areas could be designated inside of their national parks as these increasingly developed the large core areas of untouched nature (see previous section). They would also look to the last *“remaining residues of natural ecosystems”*, as they would also seek areas where human use had been discontinued, and which offered opportunity for *“new wilderness”*; such as in post-mining landscapes, in former military exercise zones, on watercourses, along coastlines, and in the high altitude mountains. The goal they set themselves in the national strategy was:

“By the year 2020, throughout 2 % of Germany’s territory, Mother Nature is once again able to develop undisturbed in accordance with her own laws, and areas of wilderness are able to evolve”

France brought out new legislation for national parks in 2006. It strengthened the use of zoning in the national parks, specifying a *“core zone”* and a *“partnership zone”* that thus joins natural and cultural landscapes, with the latter acting as a buffer for the former. Explanatory notes to the order

enacting the fundamental principles applicable to all National Parks makes the point that further subdivision of the of the core zone is justified if a wilderness area can be established to protect a particularly important reference area (25). The management objectives of those wilderness areas would be that all human activity is prohibited in order to allow ecological processes to take place without any kind of interference. Thus in Article 4 of the Order, there is a requirement to:

“Identify important natural reference areas in the core zone which could be classified as wilderness areas”

6.4 The prevalence of zoning and nesting in national systems of protected areas

Zoning as a means of identifying wildland of different characteristic along the wildland continuum was discussed in relation to a typology for Scotland (section 3.2.2); as an integral factor in defining and expressing wildland across Europe (section 3.4); in strict protection of areas inside national parks (section 5.4.1); as a means to demarcate areas of national parks with different activities (section 5.4.2); as part of the spatial implementation of ecological corridors (section 5.5); as well as in this chapter in understanding how zones can assist in aspiring to meet the objectives of an IUCN protected area category (section 6.3.2). This section gives further example of how zoning is used in the implementation of protected areas across Europe.

6.4.1 Zoning in national protected area legislation

Zoning appears in the protected area legislation of 25 countries in Europe (see Box 6.1). The example given from Hungarian legislation sets out the different types that can be classified; declares that the natural or core zones be strictly protected; and that protected areas can have buffer zones around them that function to eliminate or moderate effects which are unfavourable to the protected area.

Box 6.1 Zoning in national protected area legislation

Albania, Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Czech, Estonia, France, Germany, Hungary, Italy, Latvia, Liechtenstein, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Spain, Switzerland, Ukraine
(25/45)

Hungary

Art 28

(7) the territory of all national parks shall be classified in natural, managed and demonstration zones in compliance with the international obligations and the principles pronounced by the Minister in Decrees.

Art 29

(4) by virtue of this Act, the natural zone of national parks, the core areas of biosphere reserves and the core areas of forest reserves shall be declared strictly protected.

Buffer zones

Art 30

(1) Protected natural areas shall, in case of necessity, be defended by buffer zones. The provision of law declaring protected status shall also provide for the extension of the buffer zone (subject to Article 24 paragraph (3) section b)).

(3) The function of buffer zones is to eliminate or moderate effects which are unfavourable to the conditions or the function of protected natural areas.

Nature Conservation Act No. LIII. of 1996, Hungary

The protected area legislation of the Czech Republic - Nature and Landscape Protection 1992 - specifies zoning in national parks in Section 17:

"Methods and ways of protection of national parks shall be graded on the basis of division of the territory of national parks, usually into three zones of nature protection delimited with regard to natural values"

The Regulation that designates the park has a detailed characterisation of the park area and specifies the protection regime of the zones. The first zone has the strictest protection. As an example, Krkonoše (Giant Mountain) National Park, located in the north eastern part of Bohemia on the border with Poland, has three zones within the park, and a protection area surrounding the park (26).

- the first zone encompasses the Giant Mountain ecosystems of arctic-Alpine tundra above the tree-line, glacial cirques, forests at their upper limit, and sub-alpine meadows. It is an area where natural processes have been little affected by past human activities. Activity in the zone is limited to regulated tourism, some restoration measures, and research and monitoring. There is no felling in the forests. This zone is about 8% of the total area.
- the second zone is at lower altitude and with mountain spruce forests, moors and hillside woods inside of which are flowery mountain meadows. The forest and non-forest ecosystems there have been altered over the centuries by human activities. Activity within the zone is limited to regulated tourism, restoration measures that include felling, research and monitoring, and conservation management of the flowery meadows. This zone is 6% of the national park.
- the third zone takes up half of the park area and contains small towns and villages around which there is "*environmentally friendly*" forms of agriculture and forestry, as well as recreational and tourism facilities
- a fourth zone is a buffer around the park (34%) that forms a protective belt based on an area of sustainable development.

A map of the park and its zones is shown in Fig. 6.3. Because of the proportionately large area of the third zone in this national park, the Ministry of Environment classify the national park in IUCN Category V for a protected landscape, rather than Category II as is the case for their other national parks. As will be shown in the next section, the national protected area system of the Czech Republic has Protected Landscape Areas that are classified Category V and that are zoned as well.

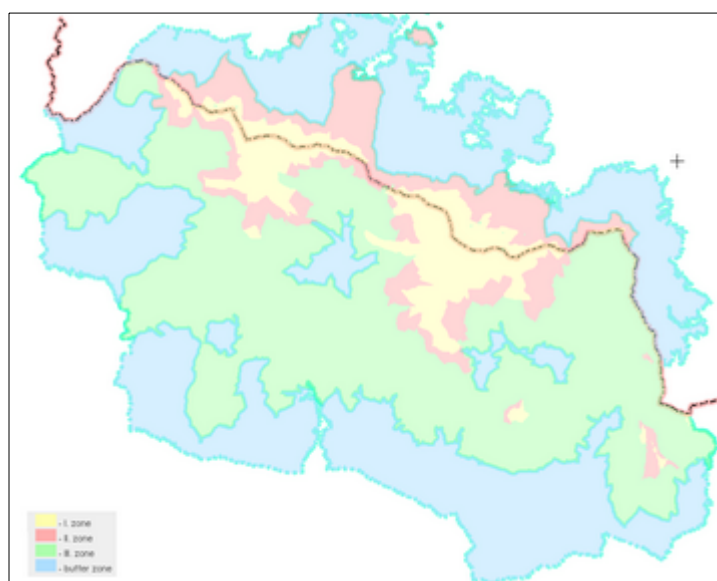


Figure 6.3 Zoning in Krkonoše National Park, Czech Republic (26). Zone 1 (yellow); Zone 2 (pink) Zone 3 (green) buffer zone (blue). Karkonoski National Park is north of the border, in Poland.

As noted in the previous section, new legislation for national parks in France identified two zones. The Park Charters define the conservation objectives for the core zone, and for the partnership zone, setting out guidelines for conservation, enhancement and sustainable development. In terms of classifying in IUCN categories, the core area of the park is reported as Category II, as would be expected for a national park. The partnership zone, however, is reported as Category V protected landscape, and thus equivalent to the cultural landscapes of National Scenic Areas or national parks in Scotland (see section 4.5). An illustration of the spatial arrangement between these two zones is shown in Fig. 6.4, where the partnership zone is a buffer surrounding the core zone.

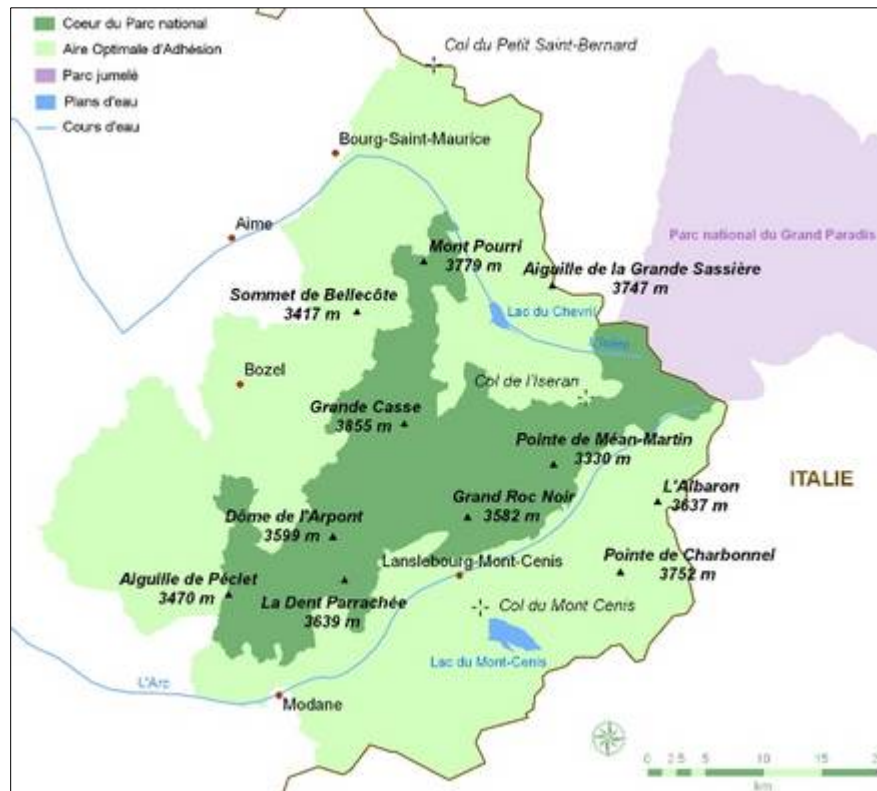


Figure 6.4 Vanoise National Park, France. Core area (dark green) partnership zone (light green)

The French believe that the conservation management of the core zone has spill-overs, serving to reinforce and preserve the natural resources in the partnership zone in terms of both quality and quantity, such as water supply and certain game species. Also that the proximity to a rich natural, landscape heritage improves the quality of life for residents in the partnership zone, making the area around the core zone more attractive. In addition, high demand for visitor access to national park core zones is a lever for the development of tourism facilities, the management of which is an aid to sustainable development in the partnership zone.

6.4.2 Zoning and nesting in the implementation of national parks and protected landscapes

The Bialowieza National Park in Poland has three zones in order to protect the *"variety of biocenosis and unique landscape values"* (27):

- a strict protection zone covers 54.4% of the area of the park and it is only under the influence of the forces of nature
- an active protection zone covers 42.2% where human interference is allowed in maintaining open landscapes through preventing succession
- a landscape protection zone of 3.4% that has agricultural use as well as providing space for the European Bison Breeding Centre.

There is also a buffer zone around the park, of slightly less area than the active protection zone. It serves the purpose of protection of the park's nature against exterior threats of an anthropogenic origin.

The national park management plans in Ireland take a zonal approach that includes natural, active management and intensive use zones (see Box 6.2). As would be expected, the natural zone has little or no intervention. Interestingly, the long-term aim of the active management zone shows the aspirational aim of upgrading the natural value of the zone, possibly to the level that it can be reclassified as part of the natural zone.

Box 6.2 Zones in National Park Management Plans

Ireland

Management zones have been identified within the National Park as follows:

A Zone (*Natural Zone*) – Areas of high conservation value which require little or no management intervention. This includes undamaged bog and heath, and aquatic habitats.

B Zone (*Active Management Zone*) – Areas of high conservation value where management input is needed to return them to a more desirable state. The long-term aim of is to upgrade the natural value of zone B areas, possibly to the level where they can be re-classified as zone A.

C Zone (*Intensive Use Zone*) – Areas used intensively by visitors, National Park administration, or areas subject to intensive landscaping, or suitable for such use or management

Killarney/Wicklow Mountains National Park Management Plans, 2005-09, NPWS Ireland 2005 (28, 29)

The Central Balkan National Park in Bulgaria provides an example of zoning for different activities within a national park through the Management Plan, as well as the nesting of different categories of protected area, as was shown with the national parks in France where the Category II core zone was nested inside the Category V partnership zone (see Fig. 6.4 above). The common model is thus of a large, less strictly protected area containing smaller, more strictly protected areas inside.

The management plan of the Central Balkan National Park defines five functional zones (30):

1. reserve zones (27.8%)
2. human impact limitation zones (approximately 19.6%)
3. tourism zones (approximately 4.6%)
4. infrastructure (buildings and facilities) zones (approximately 1.4%)
5. multi-purpose zone (approximately 46.4%).

The zones are believed to be important for two reasons (30):

- they help to direct Park operations, and the allocation of Park resources, and
- they help to inform and educate visitors about expectations regarding their behavior or actions in the Park

Reserve zones have the strictest protection in terms of preserving the natural state, but they are accessible for people walking along marked trails. The human impact limitation zones are buffer zones around the reserve zones, and the range of restrictions of activity is to prevent or mitigate unfavorable anthropogenic effects on the reserve zones, to allow undisturbed passage of wild animals between the individual reserve zones, and for maintenance of genetic flow among plant and animal populations.

The tourism zone includes trails shelters, cultural and historic heritage sites, camping and bonfire sites. The infrastructure zone has buildings which offer overnight accommodation, national park buildings, the power network, roads and road facilities, and water storage facilities for fire-fighting and general use. The multi-purpose zone includes all other areas in the Park not already included. These are mainly natural areas which, unlike the other zones, provide opportunities in environmentally sound livelihoods and long-term benefits from sustainable use of the natural resources.

Overall, the Central Balkan National Park complies through the demarcation provided by the zoning with 75% rule of a national park, which is why it is reported as a Category II protected area. In addition, the nine reserve zones are also designated as separate protected areas under the national protected area legislation and classified as Category Ib. Thus, the nine Category Ib “wilderness areas” are nested within the Category II “national park”. A map of the zonation is shown in Fig. 6.5.

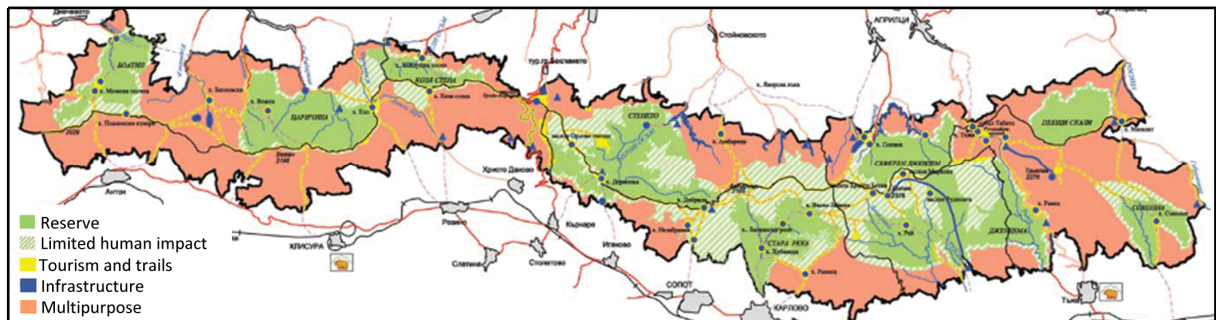


Figure 6.5 Central Balkan National Park, Bulgaria. The wilderness areas are dark green. The migratory routes are diagonal hatch.

Another example of nesting of different categories is the Karula National Park in Estonia. A map showing the nesting is given in Fig. 6.6.

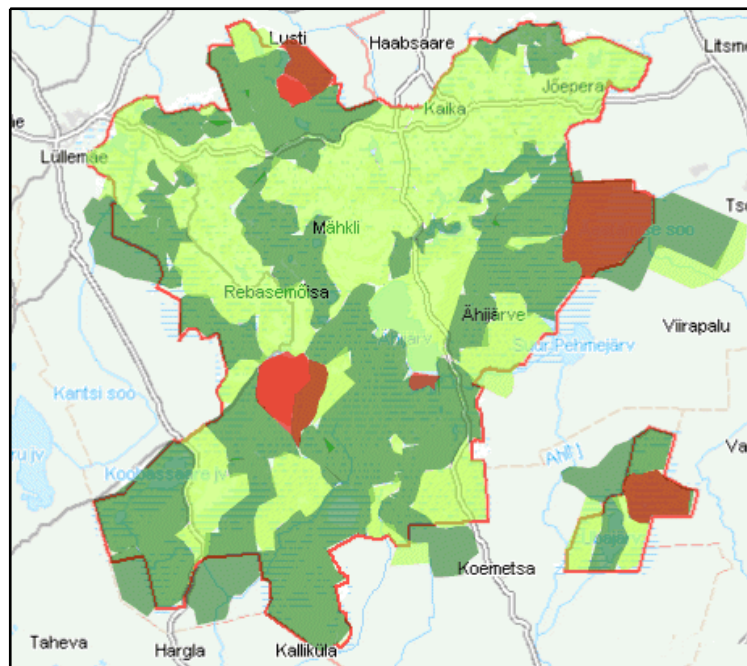


Figure 6.6 Zoning in Karula National Park, Estonia. Strictly protected areas (red) and wilderness area (dark green)

The national park is made up of the following protected area types:

Strictly protected zone of National Park (Category Ia)

Wilderness area of National Park (Category Ib)

Habitat/species management area of National Park (Category IV)

Limited management zone of National Park (Category VI)

A third example of nesting of protected areas is the National (Woodland) Parks in Greece, such as Pindos National Park (31, 32). This has a core zone classified as Category II, which is given absolute protection because activities such as grazing, logging, hunting, uprooting of plants, collection of flowers and lighting of fire are strictly forbidden. The peripheral zone of the national park is classified as Category IV, and is a game refuge where traditional activities are permitted.

Other, non-woodland national parks are made up from a variety of protected areas with varying classification. Thus the National Park Iimnothalasson Mesolongiou is made up from:

Absolute nature reserve zone in National Park (Category Ia)

Nature reserve zone in National Park (Category VI);

National Park Peripheral zone (Category VI)

Wildlife Refugee (Category IV).

The national park area itself is classified as Category II.

There is zoning in protected landscapes as well as national parks. The Czech national protected areas system has 24 Protected Landscape Areas, as well as their four national parks. The Nature Conservation and Landscape Protection Act 1992 has the following in Section 27 on the division of territory in Protected Landscape Areas:

"Usually four, but at least three, zones of graded nature protection shall be delimited, in order to specify the manner of nature protection in protected landscape areas in more details; the first zone shall have the strictest protection regime"

The Agency for Nature Conservation and Landscape Protection of the Czech Republic takes a role in the management of protected landscape areas, and has compiled information about zoning across all these areas (33):

Zone 1 – the core natural zone. This averages 11% of the total area of the protected landscape areas and is given strict protection.

Zone 2 – the semi-natural zone. This occupies 37% of the total, and it is where efforts are made to improve natural values while enabling nature friendly forms of management.

Zone 3 – the cultural landscape zone. Has 41% and is protected for the aesthetic value of its landscape; and is where a more intensive management is permitted.

Zone 4 – is the buffer zone. At 11%, it represents an area development, more intensive land use and economic activity.

Each Protected Landscape Area has a management plan that determines the strategy and objectives of the territory's protection and use, and allocates financial resources obtained from guaranteed government funding programmes.

6.5 A pan-European system for certifying wilderness core areas

The national protected area systems across Europe have the means through their legislation to designate and protect areas of land with wilderness characteristic, or land with that potential, but the variability in designations suggests that some countries may have a less clear approach than

others (see 5.4.1). The PAN (Protected Area Network) Parks Foundation, set up in 1999, has a system of wilderness designation that provides a mechanism for a uniform approach across Europe (34).

The basis of the approach is to identify core areas in national parks that can meet their definition of wilderness:

"a large area of land, (at least 10,000 hectares) which, together with its native plant and animal communities and the ecosystems of which they are a part, is in an essentially natural state. PAN Parks wilderness areas are that lands that have been least modified by man, they represent the most intact and an undisturbed expanse of Europe's remaining natural landscapes"

National parks joining the PAN Parks network draw up management plans with these core areas as distinct zones where no extractive use is allowed, and the only management interventions are those aimed at maintaining or restoring natural ecological processes and the ecological integrity. This means that hunting, fishing, mining, logging, grazing, grass cutting, road and building construction are not accepted inside of the wilderness area. However, visitors have opportunities to enjoy PAN Parks Wilderness without needing experience or special equipment.

Fragmentation is one of the most serious threats for European wilderness. This results from the pressure of human activities and development in Europe. The PAN Parks criteria allow for the wilderness area to be divided as long as it is not ecologically fragmented. There are several PAN Parks with completely unfragmented wilderness. Other parks meet this criterion with certain level of fragmentation.

The PAN Parks combine wilderness protection and sustainable tourism development. Every certified PAN Park needs to develop and implement visitor management and a sustainable tourism development strategy. The verification procedure is divided into three phases: verification of the protected area, its Sustainable Tourism Strategy, and the local tourism business partners. PAN Parks aims to change tourism from a threat to an opportunity in certified PAN Parks so that it provides real benefits for the rural communities in and around the protected areas, and at the same time reduces the pressure caused by tourism on the park. The sustainable tourism development strategy of PAN Parks is developed through a collaborative process and is a cornerstone, ensuring that tourism supports nature conservation, and guaranteeing that tourism is not introduced in sensitive areas.

PAN Parks provides effective third-party certification system under the WCPA (World Commission on Protected Areas) Framework for Management Effectiveness. The certification is based on verification carried out by independent experts, in accord with PAN Parks quality standards and principles. Principles allow for objective verification and transparency, and cover Natural values, Habitat management, Visitor management, Sustainable Tourism development and Tourism business partners. These ensure high standards of management for both conservation and sustainable development.

There are now eleven PAN Parks throughout Europe from the Arctic Circle to the Mediterranean (see Table 6.3). In Peneda Geres NP, Portugal, the PAN Parks Wilderness area includes the last remnants of native forest in the country. PAN Parks Wilderness in Borjomi-Kharagauli NP, Georgia, Fulufjället NP, Sweden, Rila NP, Bulgaria and Majella NP, Italy, all provide unique unfragmented examples of wilderness complexes. The PAN Parks Wilderness in Archipelago NP, Finland, provides an exceptional example of a no fishing zone in the Baltic Sea. The wilderness zones provide the space and freedom for the keystone species, such as the brown bear and wolf of Central Balkan National Park, the wolf of the Majella National Park, the lynx of Fulufjället National Park, or the brown bear, wolf, lynx and moose of Soomaa National Park to roam.

| National Park | | Wilderness area (ha) | Proportion (%) |
|--------------------|----------|----------------------|----------------|
| Archipelago | Finland | 10,600 | 21 |
| Borjomi-Kharagauli | Georgia | 50,325 | 59 |
| Central Balkan | Bulgaria | 21,019 | 29 |
| Fulufjället | Sweden | 22,140 | 60 |
| Majella | Italy | 25,500 | 22 |
| Oulanka | Finland | 12924 | 36 |
| Paanajärvi | Russia | 100,000 | 96 |
| Peneda-Geres | Portugal | 5,000 | 7 |
| Retezat | Romania | 14,215 | 37 |
| Rila | Bulgaria | 16,350 | 20 |
| Soomaa | Estonia | 11,530 | 29 |

Table 6.3 PAN Parks in Europe and their core wilderness area

Peneda-Geres National Park had been interested for some years in promoting large-scale ecological processes without human interference. However, the park was an unlikely location for such an area to be found, as this part of Europe had been under the influence of human activities for millennia. Fortunately, land within the park became available after farming was abandoned, albeit only the relatively small area of 5000ha, giving the park authorities an opportunity to start to restore natural ecological processes, and to be able to join the PAN Park network in 2009. The commitment of the park is that this core zone of the national park will be doubled in 10 years time, such that it will meet the PAN Park criterion of a minimum of 10,000ha (35).

The example of Peneda-Geres National Park shows the aspirational nature of going through the verification process and achieving membership of the PAN Parks network. In certifying core zones for a management approach that maintains a wilderness characteristic, the PAN Parks system encourages national park management to think more carefully about non-intervention management, and how they can progressively work towards that and achieve membership and certification. It does not stop there, at reaching the minimum area threshold, as members aspire to add more area to their core zone. The Soomaa National Park in Estonia is an example of this aspiration, and is described as a case study in section 7.2.2.

6.6 Summary

Wildland in Europe, based on the protected areas classified under IUCN Categories I, II and III is 1.9% of the total land area, or 459,019 square kilometres. This is a shortfall in the potential area that could be designated for land of a wilderness characteristic since these protected areas are easily accommodated within the area of the top 10% WQI of the wildland continuum. The shortfall is particularly notable in the Scandinavian countries where a greater proportion of their overall land area is found within higher WQI.

The aims of IUCN Categories Ia and Ib in particular are to safeguard a characteristic of wildness through restrictions on extractive activity within a protected area, and thus it is not surprising that 99% of protected areas in that classification can be found within the top 10% WQI of the wildland continuum. In contrast, only about 14% of the top 10% WQI of the wildland continuum overlaps with Natura 2000 sites.

The Natura 2000 protected area system covers both primary and secondary habitats, whereas it is likely that most habitat in protected areas classified in IUCN Categories Ia and Ib is primary. A secondary habitat designated under the Natura 2000 system would thus need that designation removed if there was an aspiration for the protected area to take on more of the characteristic of wildland. This has implications for the development of the Guidelines for the management of wilderness and wild areas in Natura 2000 that were discussed in section 2.5.

Recent national reporting for protected areas classified under IUCN categories indicates an aspirational aspect of the system as it shows a greater coverage by using more of the categories, as well as an up-rating of previously reported protected areas within the IUCN categories. It is evidence of wide-scale adoption of the system, and of its potential as a means of redefining protected areas across continental Europe. There is an element of up-rating as well in the aims for developing protected areas towards the 75% rule for IUCN categories, and in particular for Category II National Parks of progressively removing extractive activities. Policies and biodiversity strategies also show a trend of increasing the area covered by national protected area systems through designation of new parks and wilderness.

Zoning as a means of identifying wildland of different characteristic along the wildland continuum is widely represented in national protected area legislation, as well as in the management plans and implementation of protected areas. Nesting of different protected area types is also common so that the overall model is thus of a large, less strictly protected area containing smaller, more strictly protected areas inside.

The objectives of protected areas are met when natural values are separated from cultural values by placing them in different zones, but are brought back together through spatial integration of the zones. Thus wildland areas may be buffered by cultural landscapes providing that the use of those regulated landscapes of the buffers themselves is not inimical to the wild area - the buffer areas hold at bay the effects of a greater intensity of land use in the wider landscape. People who live in the buffer area benefit from the wild area by it being an attraction to which they can provide tourist facilities, and by the spill-overs from the natural services that the wildland can provide passively and without extraction.

The PAN Parks network provides a mechanism for a uniform approach of wilderness designation across Europe. National parks joining the PAN Parks network draw up management plans with core areas as distinct zones where no extractive use is allowed. The drawing together of natural and cultural values is through the requirement of PAN Parks to combine wilderness protection with sustainable tourism development.

The zoning of protected landscapes is an important point to consider in Scotland, where the National Parks and National Scenic Areas could use the approach of zoning to meet safeguards for natural value within those protected landscapes. An analogy would be with the proposed expansion of the Biosphere Reserve in Galloway, which is described later, in section 8.4.1.

CHAPTER 7 COMPARISONS OF ANALOGOUS LANDSCAPES

In previous chapters, an assessment of existing wildland was based on an overall evaluation of the approaches for the protection and management of that wildland in light of national legislation and policy mechanisms that have been put in place, or are under development. To make use of this assessment in a Scottish context, an appraisal can be made of analogous landscapes across Europe that mirror in some way, the characteristics and conditions of wild landscapes within Scotland.

There are of course no perfect analogues, but there are similarities that mirror specific combinations or individual aspects of wildness such as their physical characteristics, and their social and historical context. Those identified were chosen on the basis that a comparative study would demonstrate better integration between management for multiple benefits for both people and wildlife (i.e. ecological processes, biodiversity, landscape, recreation, cultural value, health and wellbeing). Areas of particular relevance to policy in Scotland on the future management of wild land are highlighted.

7.1 Cairngorms National Park and Hardangervidda National Park

These two national parks have many features in common: a large mountain area having few roads or infrastructure, and a nature conservation value existing alongside a range of recreational and extractive use. The two parks are also remarkably similar in terms of feel and topography, with the exception that the Hardangervidda is much larger and still has remnant glaciers and ice caps, as well as extant keynote species in brown bear, wolf, wolverine, and arctic fox.

7.1.1 Cairngorms National Park, Scotland

7.1.1.1 Cairngorm history and natural value

The Cairngorms National Park at 3,800 square kilometres is the largest national park in Britain (1). A mountainous area, it has four of Scotland's highest peaks, 10% of the land area over 800m, which increases to 68% for land over 400m above sea level - the largest area of high land in Britain. The elevation and continental location make for low winter temperatures, cool summers and a short growing season, leading it to be regarded as having an "*arctic*" environment. Lower down, there are the river valleys of the Spey, Dee and Don.

Much of the area is covered in heather moorland. The forests of the Cairngorms contain remnants of the original Caledonian pine forest. Amongst birds, there is the Crossbill, the only bird species endemic to Britain, as well as the golden eagle, osprey, dotterell, and capercaillie. Animals include pine martens, red squirrel, badger, wildcat, water vole, and otter. The rivers are home to a rising population of the freshwater pearl mussel, as well as salmon, trout, and lampreys. There is a captive reindeer herd based in the Northern Corries of Cairngorm. Some reindeer are present in the site in the summer months often on the northern slopes of Ben Macdui.

Human settlement in the Cairngorm glens increased in the second half of the 18th century (2). Over the next 100 years, a pattern developed of permanent or summer occupation of shielings (small houses made from local materials) where there was small scale cultivation or low intensity summer grazing of cattle. Remains of these settlements can still be seen in Glen Feshie and Glen Derry. This was a period also of cattle droving through the Cairngorms to the markets at Falkirk and Crieff.

In the early 19th century, sheep farming replaced subsistence agriculture, but the sheep were never very successful so that summer grazing by cattle lingered on in some places until the late 19th century. By the mid 19th century, deer stalking and grouse shooting became popular and the

associated management of heather burning, winter feeding of deer and increased deer numbers was paralleled by a reduction in both domestic livestock numbers and regeneration in the native woodlands.

However, the overall lack of natural regeneration in many areas of the Caledonian pinewoods, the absence of a "*natural*" tree line, the lack of a shrub layer in the forest and the paucity of broad-leaved trees throughout the existing woodlands is evidence of past and present levels of grazing from sheep and deer. The removal of vegetation through over grazing and trampling has also affected heathland, wetland and plateau communities, where the soil has become exposed and erosion has occurred and the extent of some communities (e.g. montane scrub) has been reduced. Deer Management Groups now limit the damage arising from the impact of deer.

By the mid 20th century, the extent of heather (muir) burning in the management of grouse moors had reduced, lapsing in many areas, and thus reducing the adverse impacts it had on native woodland remnants. Poorly built tracks, constructed in the past to facilitate vehicle access for sport shooting, have caused damage to plant communities and have aided access to the interior. Erosion of these poorly constructed tracks increases siltation of water courses. A programme of track reduction and removal is underway on some estates, such as at Mar Lodge, owned by the National Trust for Scotland.

Hill walking as a recreational activity developed during Victorian times, but there was a major expansion in the second half of the 20th century as walking, climbing and skiing took off and became a key element of the local economy. In 1999, the Cairngorm Mountain Survey estimated 123,000 visitors per year to the mountain. There are several open bothies, an unlocked mountain shelter. There are popular sites for winter and summer climbing at Loch Avon basin, Coire Etchachan and Coire Sputan Dearg. However, increasing numbers of visitors to the Cairngorms has led to disturbance of resident and migratory birds and damage to habitats and plant communities, especially along well used routes to the summits, and in areas used for wild camping and snow holing.

7.1.1.2 Establishment and supervision of the Cairngorms National Park

The Cairngorm area became the second national park in Scotland in 2003, under the newly enacted National Parks (Scotland) Act 2000. The area of the national park is home to 16,000 people, living mostly in the major towns, and in dispersed settlements in the countryside. Tourism-related businesses account for about 80% of the economy, including activities such as skiing, walking, fishing, shooting and stalking. In terms of ownership, 75% of the park area is privately owned, 13% is in beneficial ownership with the voluntary sector, and 10 % is publicly owned.

The Cairngorms National Park Plan brought together all those involved in managing the park to set out a long-term vision; a framework for management and priorities for action. It set out how everyone in the Park can work together to achieve the four aims of the plan to (3) :

- conserve and enhance the natural and cultural heritage of the area;
- promote sustainable use of natural resources of the area;
- promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public;
- promote sustainable economic and social development of the area's communities.

The Park Plan identified seven Priorities for Action that were to be delivered between 2007 and 2012. These include action on biodiversity and landscapes; integrating public support for land management and including deer management; support for outdoor access, tourism and local

businesses; making housing in the towns and villages more affordable; and cementing the existence of the park with local people.

The management plan recognises that the national park falls into the category of a protected landscape area and is thus classified as IUCN Category V. There are however many other national and international designations on the area of the park. The Cairngorm Mountains and the Desside and Lochnagar National Scenic areas are encompassed within it (4, 5). There are eight National Nature Reserves, three of which are in the central core of the park area, the latter being covered by the Cairngorms SSSI (6). Within the SSSI is a Ramsar wetland site that is designated for high altitude, low nutrient lakes (7); and an SPA for birds such as osprey, dotterel, falcons, crossbill, and capercaillie (8). There is also a SAC covering the SSSI, which has priority habitats of Caledonian forest (91C0), Alpine and Boreal heaths (4060), Blanket bogs (7130) and Bog woodland (91D0). Otter are also part of the designation of the SAC (9).

The national park has the new, general duty put on all public bodies and office holders by the Nature Conservation (Scotland) Act 2004 to further the conservation of biodiversity. It also has the power to make byelaws to protect the natural heritage of the National Park and prevent damage to the land (see section 4.5.1). However, it does not have direct authority on the activities taking place in those designated areas, which are the responsibility of the statutory agency for nature conservation in Scotland (see section 4.5.2).

7.1.2 Hardangervidda National Park, Norway

7.1.2.1 Hardangervidda history and natural value

Hardangervidda National Park is located in the south of Norway, and it is Norway's largest national park having an area of 3,442 square kilometers (see Fig. 7.1 below). It spans across the Hardanger mountain plateau from Numedal and Uvdal in the east to Røvelseggi and Ullensvang in the west, taking in about half of the plateau area. The plateau of extensive, undulating plains is the largest eroded plain in Europe, with elevations in the range of 1,100 to 1,500m. The highest point on the plateau is in the mountains to the west, where the top of the Hardanger glacier reaches a height of 1,863m.

The landscape of the Hardangervidda is characterised by treeless moorland, interrupted by many pools, lakes, rivers and streams (10). The variations in bedrock and climate mean that the diversity of vegetation varies from western to eastern parts of the plateau. Plant species grow more vigorously in the west where there is more rainfall and a more even temperature. The eastern plateau is far less fertile. Windy heaths are common in areas there with little snow and poor bedrock. There are no roads in the national park area, but there are off-road tracks that are used by tractors, the main means of towing material in and out of the park.

The flat landscape of the plateau, with its many shallow and nutrient-rich lakes, rivers and wetlands distinguishes Hardangervidda from other mountainous areas in southern Norway. The thousands of lakes are rich in fish. This habitat provides for some of the largest populations of ducks and other wetland species in southern Norway, such as breeding populations of black-throated divers, scaups, velvet scoters, common scoters, dotterels, Temminck's stints, great snipes and shore larks. Both ptarmigan and willow grouse are found on the plateau, but their numbers fluctuate significantly from year to year.

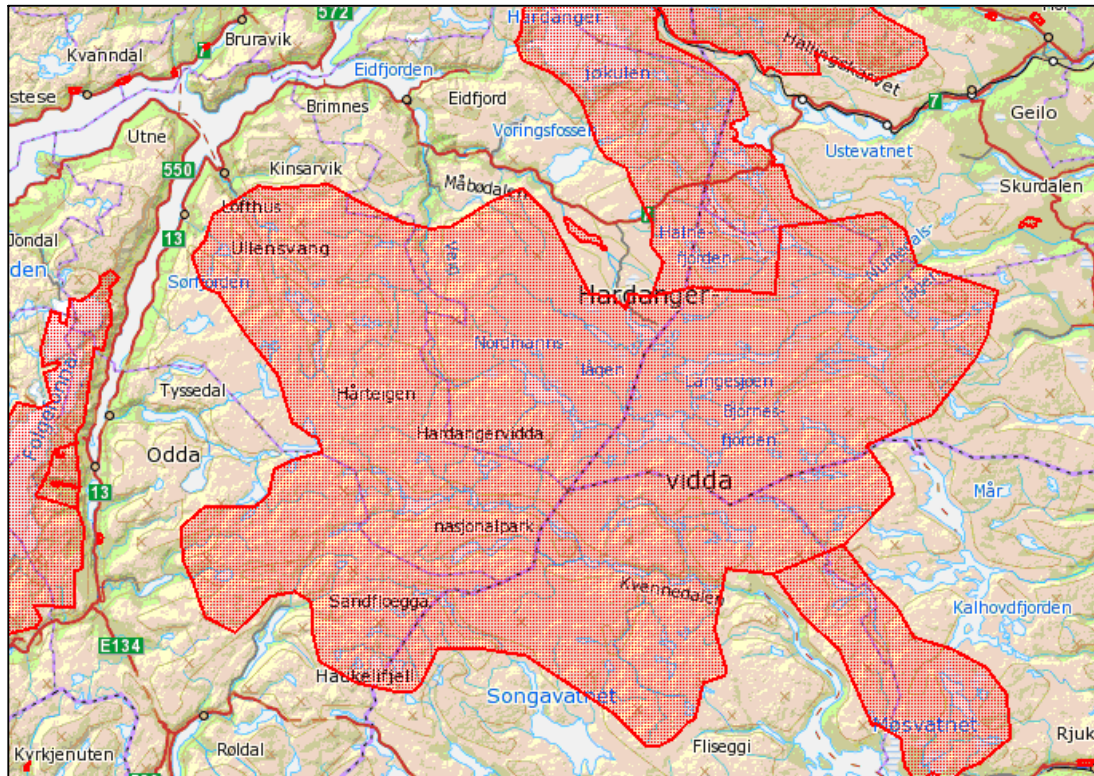


Fig 7.1 Hardangervidda National Park is the central area delineated by the red line– note the many lakes. From the Directorate for Nature Management, Norway

Native carnivores in this area include Brown bear, wolf, wolverine, red fox and arctic fox. Wolverines and arctic foxes were numerous in the Hardangervidda during the late 19th century (11). However, high hunting pressure brought the populations down to critical levels. Today, Hardangervidda has some of Scandinavia's few remaining populations of arctic foxes. The populations of arctic foxes are presently declining in all Scandinavian countries, even though the species has been protected since 1930. A restoration program has therefore been initiated including the release of animals bred in captivity, and Hardangervidda is one of five source areas for the captive breeding program. All the larger carnivores, with the exception of the red fox, are protected in Norway, and their numbers are on the rise, bringing conflict with farming communities.

The Hardangervidda plateau is home to the largest wild reindeer herd in Europe – there were about 8,000 in 2008 (12). Every spring, the large herds of wild reindeer migrate westwards from their winter grazing on the eastern part of the plateau, to where high precipitation and nutrient-rich soils provide good summer grazing with grass for both reindeer and domestic livestock. Large flocks of sheep are taken there to graze each summer. After the rutting period in autumn, the animals migrate back eastwards again to the windy lichen heaths. The availability of winter grazing limits the size of the reindeer stock on Hardangervidda. The objective of the wild reindeer management on the plateau is to stabilise the winter population to accommodate it to the grazing resources.

Botanists have shown that, at times during the Stone Age, Hardangervidda had woodland and scattered trees as high as 1100 – 1200m. Finds from excavations of Stone Age sites show that the people hunted reindeer and ptarmigan; elk and trout bones were also found. The old paths crossing the plateau were important routes linking southeast and west Norway. Traces of human occupation remain in the landscape, one of the most common being the many small, mostly collapsed stone cottages. If it is near a fishing lake, then it is likely that it was there for that purpose. Stone cottages are also found on the mountainsides, and they were most likely to have been built as a shelter for

wild reindeer hunters. The lush vegetation outside some of these suggests there may have been cattle or horses at the time of year when the mountains had pasture for animals, bought in spring on the west coast, and after a summer in the mountains taken back east where they were sold as live animals or slaughter.

There are also remnants of pitfall animal traps on the plateau, used during wild hunting. These pitfall traps were built with a width of 60-80cm, and with a length and depth of approximately 2m. Low rows of stone radiate out diagonally from the corners of the traps as a means of guiding grazing animals into the trap. The pit opening was hidden by covering a lattice work of branches with moss and grass. When a reindeer stepped out on to the covering, it would give way and the animal would fall into the trap. Another method of trapping was to drive reindeer through funnel-shaped systems of fences that ended at a lake. When the animals swam to escape their pursuers, they were met by hunters in boats and killed. This method of trapping wild reindeer was traditionally used throughout the range.

7.1.2.2 Establishment and supervision of Hardangervidda National Park

Evidence of a more recent human presence on the plateau are the remains of shacks used by hunters and fishermen, old trackways and paths, remains from forestry, charcoal and tar production, and traces left by haymaking and former transhumance dairy farming. However, the plateau has come into the present without major infrastructure development such as roads, power lines and railway lines (see Fig. 7.2). That and the substantial natural value of the area led to it being designated a national park in 1981 under section 5 of the Nature Conservation Act 1970 in force at that time, but which has now been superseded by the Biodiversity Law, 2009. The Hardangervidda National Park is classified under the IUCN system as a Category II National Park.

The Regulations for the Protection of the Hardangervidda National Park has its purpose (13):

“to protect part of a particularly valuable mountain area in such a way that the landscape with plants, wildlife, natural and cultural heritage and cultural environment otherwise is preserved, while the area is used for agriculture, nature-friendly outdoor activities and scenery, hunting and fishing and teaching and research”

The regulations state that the landscape should be protected against developments, installations and other interference of any kind, including road building, cultivation, fertilization, drainage and other forms of reclamation, parking of caravans, huts, etc., mining, quarries and gravel pits, power and phone lines, cableways, elevators and construction or reconstruction of buildings. A goal is to keep motorised traffic in the park at a lowest possible level, and there are a range of conditions about when snowmobiles can be used in winter.

The regulations require protection of animals and their settlements: burrows, nests and eggs should be protected from damage and destruction. Birds are given especial consideration as they should be protected *from “unnecessary anxiety of all kinds, including photography and other unrest in the nesting season”*. Plants, including living and dead trees and bushes, are also required to be protected from damage and destruction of all kinds, including from agriculture, but also from walkers straying off trails. Mushrooms and berries can be gathered, and herbs can be picked providing the root is not taken or damaged. Taking birch, willow, juniper, spruce and pine for use locally is allowed provided that it does not lessen their presence. The Directorate for Nature Management may issue regulations that control grazing if it is deemed to be damaging the natural environment. The Regulations require a management plan to be written, more of which later.

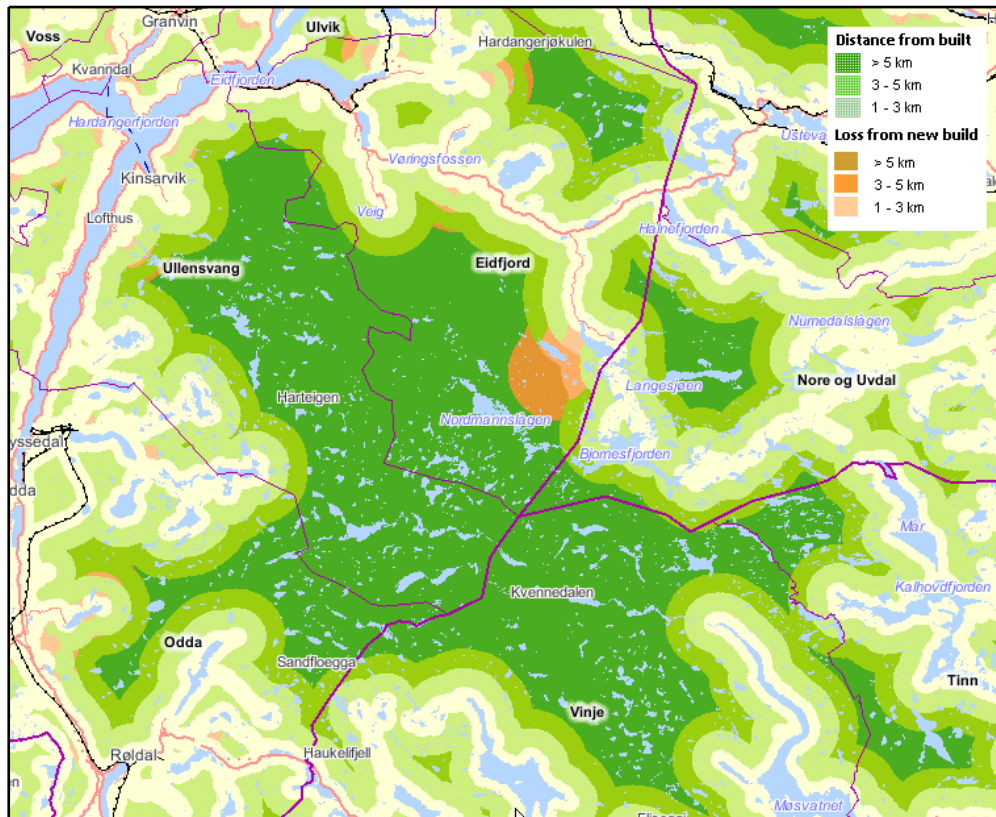


Figure 7.2 Distances from major infrastructure (green) and loss from new build (orange) on the Hardangervidda plateau. From the Directorate for Nature Management, Norway

The park is a much used recreational area for hunting, fishing and other forms of nature-friendly outdoor activity such as hiking and cross-country skiing. There is thus an extensive tourist industry in the villages around plateau, and it forms an essential part of the employment and settlement in the local community. There is a large grid of marked trails in the summer, taking people across the landscape to the fishing lakes and hunting areas. Routes in the mountains are marked with cairns, and many of these follow ancient paths, along which can be found traces of human activity from hundreds of years ago. Cross country ski trails are marked in winter.

Huts and lodges are provided for summer walkers and winter skiers. There are seven staffed lodges, and five self-service huts, some maintained by the Norwegian Mountain Touring Association. Two national park visitor centres lay just outside the park area: the Hardangervidda National Park Visitor Centre is on Møsvatn, a large lake in Tinn, at the eastern threshold of the upland plateau of Hardangervidda; and Hardangervidda Nature Centre in Eidfjord, on the west side of Hardangervidda. The latter is owned by Eidfjord Borough Council.

Responsibility for upholding regulations in the park falls to employees of the Norwegian Nature Inspectorate (SNO) part of the Directorate for Nature Management (14). There are four of these personnel, based around the park, and their purpose is to safeguard national environmental values and prevent environmental crime through enforcement of the Nature Conservation Act, motorised traffic law, the Cultural Heritage Law, Wildlife Law, Salmon and Inland Fisheries Law and parts of the Pollution Law. They also give guidance and information, undertake practical management tasks, and carry out registration and documentation work. The SNO have limited authority in law and thus cooperate with police.

SNO passes on part of its oversight responsibilities through subcontracting supervision and monitoring services on the plateau to the Hardangervidda Mountain Board. Mountain authorities are established through upland legislation, and the Hardangervidda Board is fully owned by the seven councils surrounding the mountains. Mountain Boards in general manage all usage rights on the state commons, including hunting and fishing (15). These state common areas encompass about 11% of the upland area in Norway, and in the case of Hardangervidda National Park, it is the 48% owned by the state. Mountain Boards balance the best interests of the legitimate users and the business community, while they also preserve conservation and leisure interests. Mountain Boards have limited enforcement authority, exercising control by the same section referred to in the Act on the Norwegian Nature Inspectorate. In 2007, they had six permanent staff in headquarters in Geilo.

SNO may by agreement with private landowners undertake private legal supervision in their area, which constitutes 52% of the national park. It is very difficult to determine the exact number of landowners in conservation areas on the plateau, but it is recorded that there are about 156 different private properties.

The municipalities have management authority for the Planning and Building Act and legislation governing wildlife and fish management, pollution, fire protection, motorised transport in wildland areas, agriculture, etc. Counties have authority in relation to the county planning and cultural heritage. Other public-sector authorities who have responsibilities in the park area are labour, food inspections and police. As different laws come into conflict with each other, there may in some cases be doubt about which law takes precedence. However, the Nature Conservation Act largely goes before the Planning and Building Act, agricultural land regulations, and the Leisure Act.

7.1.2.3 The management plan for Hardangervidda National Park

Hardangervidda was one of only two national parks in Norway in which the national plan for national parks, adopted in 1993, also referred to agriculture, hunting and fishing as targets for protection. The other park, Jotunheimen National Park, has less than 1% of its land area privately owned, and thus its targeting for those activities was surprising, in as much as it also indicates the extent of the pressure that Hardangervidda National Park may experience from extractive land use because of its much higher private ownership and predominance of state commons.

The area around the plateau exhibits a typical village-to-mountain relationship, with extensive agricultural exploitation of resources in the mountains by the villagers, and with methods adapted to this, including large scale sheep farming, commercial fisheries, the income from hunting, and through tourism. Many parts of the cultural heritage and environment of the plateau have their origins in the agricultural exploitation through the centuries and, as is usually regarded, it is thought to enhance the experience of mountain areas through its mark on the diversity of vegetation types and fauna. It has thus always been a major challenge for management to find the right balance between conservation and extractive use.

The latest management plan to be drawn up for the park on behalf of the County Governors of Buskerud, Hordaland and Telemark, and their audit committees, was sent for approval in April, 2010, to the Directorate for Nature Management. Amongst the goals for management, it gave high priority to (16):

"ensuring conservation values through active surveillance and to implement necessary measures when conservation values are threatened as a result of adverse use. The use shall be made in a way that is not detrimental to the conservation purpose. Therefore it is desirable to ensure local participation on the management of protected areas, and achieve a common understanding and consensus on goals, strategies and guidelines for the management of protected areas"

The plan has a surprising admission. Even though extensive knowledge had been gained through the national monitoring program and the established management of wild reindeer on the Hardangervidda, there were still gaps and inaccuracies, especially in the years 2000-2002. The plan accepts that there is a good deal of older documentation on animal and plant life on the Hardangervidda, but no systematic documentation of changes that have occurred and their cause. Thus there was very little documentation on the landscape conservation value, both about the qualities that the landscape has on different parts of the plateau and of the factors which affect the landscape. The same applied to cultural and heritage conservation as a value. It claims that in the absence of knowledge about the state of development and the factors that affect conservation values, it is impossible to devise the appropriate management measures when there is a need for it.

The new plan does not propose any substantial changes in management practices. While noting the Government's signal of increased use of protected areas, unless it should go beyond conservation purposes and conservation values, new and possibly increased use on Hardangervidda must therefore be carefully assessed in relation to the effect on conservation interests over time. The challenge is thus to control the use so it does not affect the conservation values negatively.

There is a spatial approach to management, based on zoning to demarcate different areas for different interests and use. National guidance from 1994 on zoning in national parks gave the following categories:

- Category 1: Special Protection Zone
- Category 2: Zone without facilitation and intervention
- Category 3: Use Zone
- Category 4: Zone with special arrangements and procedures

Later guidance had Category 2 as "*Site Preservation – management*", but the park plan kept with the original name. In declaring zones in the park, and for two other protected areas that abut the park, a number of criteria were established as a basis for assessing the area to be placed in each zone. They were based both on what the existing environment was, and what was wanted in the future. These were the considerations:

- regard to wildlife in fragile periods for reindeer (calving/winter) and for wetland birds (breeding)
- location of marked touring routes and tourist cabins
- opportunity for commercial harvest on private properties
- extent of approved off-road tractor tracks
- in respect to specific elements in the landscape, such as roads
- the desire for a simple and transparent zoning

A map of the zones is shown in Fig. 7.3. There is only one small area of a special protection zone in the park (Plot 1 nested inside Plot 6). The purpose of the zoning here is to safeguard the bird life in a very important wetland area during the breeding period. The bird life is vulnerable to walks during that period, as well as net fishing, anglers, river enthusiasts and other outdoor activities. Those activities would be barred in the period from June 1 to when reindeer hunting begins in August.

Plot 3 is the second largest area of the park, and is categorised as a "*zone without facilitation and intervention*". The purpose of the zone is to ensure a large and relatively untouched area, with essentially no heavy technical interventions, almost without marked touring routes and without tourist cabins. The area has hunting and fishing huts on private land, state land and municipal property, and the area is used for hunting and fishing as well as other outdoor activities. There is some grazing especially in the western part of the zone. It is however, a relatively undisturbed area

for breeding herds of wild reindeer on summer pasture due to lack of walks in the area. Restrictions are placed on the use of tractors and towing.

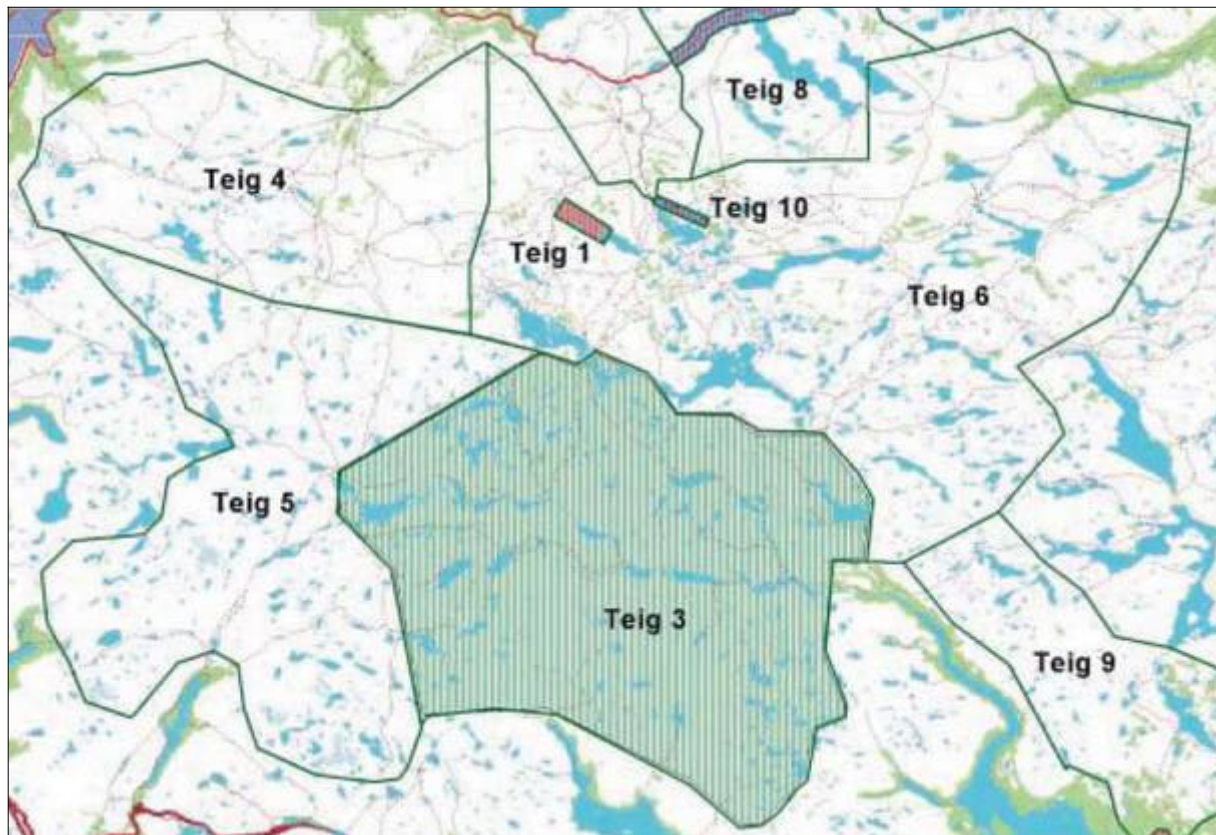


Figure 7.3 Management zones in Hardangervidda National Park (Teig = Plot in text)

Plots 4, 5 and 6 are “use zones”, but they each have differing attributes and management approaches. Plot 4 consists of private land and a former farm area. Much of it in some years is used as a calving area for reindeer. The site has an extensive network of marked touring routes and way-marked tracks, and contains several tourist cabins. A key objective is the preservation of heritage, and cultural landscape. The area is to be kept free of heavy infrastructure development, but within the framework of the conservation purpose, it can be opened up for a careful development of hunting, fishing, outdoor recreation and small-scale tourism based on natural and cultural experiences, and based on existing buildings, such as old farm facilities. Small changes in the path and trails could be used to channel walks away from more vulnerable areas. All measures will be assessed with regard to concern for the wild reindeer during calving.

Plot 5 is mainly on state land and has traditionally had a lower intensity use than Plot 4. The area is used for traditional harvest as hunting and fishing, and for sheep grazing, and provides a large walking area. The northern part is used in periods as a calving area for reindeer, and the eastern part is important summer pastures for reindeer flocks. The purpose of the plot is to maintain a large and untouched area without heavy infrastructure development and with a low intensity use for the future. As with Plot 4, all measures will be assessed with regard to concern for the wild reindeer during calving.

Plot 6 includes several of the most used areas in the park, both on private land and on state commons. There is a widespread industrial fishing and an extensive sheep grazing, and almost all approved tractor towing in the national park. There is also a well-developed network of touring

routes and trails, and several of the largest tourist cabins are located in the plot. The eastern part contains important winter pasture for reindeer. The purpose of the plot is to maintain relatively high usage levels for agriculture, hunting and fishing and traditional outdoor activities, but within the framework of the conservation purpose. There is careful development of the path and track network to channel walks from more vulnerable areas. Due regard is to be taken with reindeer in winter.

Plot 10 is a small area of access for car parking in the national park after arrival off Highway 7, and delimits the area available for that with no further access into the park.

There is obviously a cost associated with the management plan for such a large and complex conservation area that is resource intensive in terms of waymarking, track maintenance, tourist cabins, supervision and enforcement etc. The level of ambition embodied in the management plan therefore has to be proportionate with available resources for management and supervision work. It is perhaps fortunate that an increase in the national budget for 2010 for environmental protection in Norway was announced in October last year (17). On the back of that increase, a new scheme was announced that would be established with the local management of national parks and large protected areas.

The new national plan for protected areas indicated that strengthened management was needed to ensure conservation values, and would be an important follow-up of the biodiversity law. An increase of 54 million kroner (£5.73m) will partly go on the new scheme in the employment of national park managers, strengthened supervision, preparation of management plans, management and measures in protected areas, and strengthening of the national park and wildlife information centres. To cover the costs of implementation of the national plan and its new scheme, 7.5 million kroner would be added, as well as a further 3 million kroner for the monitoring of protected areas. Taken together, the Norwegian Government proposed 223 million kroner (£23.68m) to manage protected areas in 2010.

7.1.2.4 Hardangervidda – wildland or wild area?

There was criticism of the draft management plan during the consultation period, some considering that it didn't give enough emphasis in allowing development of new or more use. Others that hunting and fishing appeared less important, or that recreation was being over-controlled. However, two professors from the Finse Alpine Research Centre pointed to the absence of involvement of the Ministry of Environment and the Directorate for Nature Management in developing the plan, as the management plan was of national status and interest; that ecological communities and information on their functioning in the park was lacking; and that there was little specific detail on what conservation of the natural value meant in the park (18).

The management plan did not, for example, consider how much grazing pressure came from sheep and reindeer in different areas, which they said had severe effects on the vegetation and plant communities of the national park. This led them on to point to the conflicting information given in the plan about what kind of landscape there was in the national park. On the one hand, it was described as a landscape that humans, in varying degrees, had exploited for thousands of years. In other places it was described as a "*natural landscape*". They noted that the constant grazing of horses, sheep, cows and goats had had a considerable impact on the landscape, such that it would be better called a "*cultural landscape*". That this exploitation had left it "*untouched*" as appeared as a description in the plan, was regarded by them as "*little more than naive domestic romance*".

The professors noted that all the fish in the Hardangervidda lakes were put there by humans thousands of years ago, and fish stocking of the lakes was continuing today. Despite this, there were some smaller lakes and ponds in the high ground of Hardangervidda that were free of fish. Many rare

invertebrates, particularly crustaceans and insect species found refuge in these fishless lakes and ponds, so that those sites represented controls for the dynamics of the lakeland ecosystems in the absence of fish. Their concern was that the presence of fish may drastically reduce the availability of invertebrates for diving ducks. These have declined in the park, particularly the red-listed species Scaup (IUCN Redlist *vulnerable*) and Velvet Scoter (IUCN Redlist *near threatened*) (19). They called for a systematic review of such lakeland sites, and for the management plan to have measures to ensure that they remained free of fish.

Given the strong conflict between the use interests and conservation interests in the national park, the professors thought the management plan should consider making an additional differentiation between the use zones and protection zones:

"Norway ought to afford to set aside a large natural area with absolute protection with regard to hunting, livestock grazing and net fishing. National authorities have the ability to translate that into such an area on state land - in most countries it is this that which lies in the term 'National Park'"

The revised version of the management plan for the Hardangervidda took account of 19 of the points contained in the 28 consultation responses, suggesting that it now contained measures to give more focus on the key conservation values, and how these should be taken care of. On the concern of the Finse Alpine Research Centre about the lack of a specific ecological approach to conservation, the response from the drafters was that the strategies for the management of protected areas on the Hardangervidda that were in Chapter 3.4 of the plan had been through a long process and were difficult to change in the final phase of the audit (20). On the other major concern, of zoning an area for absolute protection:

"The idea of an area where nature can get to groom himself is otherwise good and is used in national parks in other countries, but there is no tradition of such stringent use restrictions in the Norwegian National Parks"

This is a surprising comment since seven of Norway's national parks (Blåfjella-Skjækerfjella, Dovre, Jostedalbreen, Jotunheimen, Reinheimen, Rondane, and Saltfjellet–Svartisen) have IUCN Category Ia protected areas nested inside their park area, and which under Section 37 of the Biodiversity Law would be areas without human intervention or actively managed.

That the Hardangervidda is "*untouched*" could be inferred by the patterns revealed from the spatial data on major infrastructure development that showed most of the park to be undeveloped (see fig. 7.2). This is the attribute of remoteness that is often mapped in British upland landscapes that are also roadless areas with little other infrastructural development. What the professors were saying though is that remoteness doesn't necessarily equate to wildness or being "*untouched*" when the landscape has been modified over thousands of years by cultural use. Thus in their eyes, wildland had to be where extractive use was withdrawn as the means to safeguard and restore natural processes. The rest would thus be the undeveloped space, but which still had cultural pressures.

The Hardangervidda brings in to sharp focus the issues about wildland and extractive use. It has perhaps more of its native flora and fauna still extant than many other worked upland areas, hence its recognition as a protected area. But is it a national park which protects whole, functioning ecosystems; an "*ethnological*" preserve like the Sámi wilderness that is based on native resource protection and use; or is it a protected landscape that is ultimately cultural and which has an emphasis on sustainable development rather than on conservation of wildland?

The spatial demarcation for the zoning of the Hardangervidda National Park seems a simple division compared to the likely realities of the plateau (see Fig. 7.3) and the differential between them of the aims and management approach are small. It seems unlikely that a few "*core*" areas could not be

found within the Hardangervidda, like there have been in other Norwegian national parks (see earlier). While local communities and experience have a role, the knowledge learnt from the wider community of wildland protection would have greatly informed the working group for the management plan, as was noted by the professors when they asked for the involvement of national authorities (see earlier) but they went even wider:

"In light of the national park's international conservation value and our obligations under international law through the Berne Convention, should not foreign representatives and consultants be involved in the working group"

7.2 Rannoch Moor and Soomaa National Park

The many similarities in wetland features, including Natura 2000 habitats and Ramsar wetland, indicate that Soomaa National Park is a likely analogue to Rannoch Moor.

7.2.1 Rannoch Moor, Scotland

Rannoch Moor SSSI is located in the central Highlands of Scotland, to the east of Glen Coe (21). Within its area of 10,102ha, it encompasses an extensive blanket bog as well as fen complexes, which combined constitute about 72% of its area. Blanket bog occupies hollows, level ground and gentle slopes, with species composition reflecting overall wetness and water movement. There are large areas of heath on shallow peat and small areas of grassland, bracken and native woodland are also present.

The moor contains many waterbodies that constitute 10% of the area, and which vary greatly in size. The smaller ones are peaty and have low species diversity from the low nutrient content. The large waterbodies have an intermediate nutrient level and a greater range of species. Uncommon open water and moorland bird species regularly breed at the site, including black-throated diver, greenshank, dunlin, common sandpiper, greylag goose, red and black grouse, stonechat and wheatear. There are also beetle, moth and fly species of interest.

The land is used for a wide range of activities, including deer stalking, fishing, and recreation (22). Popular walking routes exist cross the moor such as the West Highland Way and the public right of way from Kingshouse Hotel to Rannoch Railway Station. Many people walk only a short distance into the moor from road lay-byes and from Rannoch Station. Occasional canoeists cross the Moor from the A82 to Rannoch Station.

There are multiple designations that cover part or all of the SSSI. Part is a Ramsar wetland site (23), and another part is a SPA for black-throated diver (24). A SAC covers all of the SSSI, with the priority habitat being blanket bog (7130) as well as transition mires and quaking bogs (7140) (25). In terms of species, the SAC is designated for otter and freshwater pearl mussel.

Most of the area of the SSSI is owned and managed by three private estates, but a part that is a National Nature Reserve (1,499ha) has been publicly owned since 1958 (26) and is managed by SNH. Management agreements between SNH and the private owners pay for specific land management activities (22). The management scheme includes measures to reduce the frequency of accidental fires through wardening, the erection of signs warning against lighting fires, and the production of fire plans. The scheme has not yet prevented all fires. The scheme also includes wardening for illegal pearl fishing.

The scheme does not address grazing or browsing pressure. However, one private land owner has been grazing cattle in the area north of Loch Laidon as part of a long-term trial to establish their

effect on landscape vegetation (27). Malcolm Pearson, owner of the Cruach estate at the eastern end of the moor, claims that sheep and deer had degraded the landscape by overgrazing when the cattle-based economy was replaced in the early 19th century first by sheep, and then by sheep and deer.

7.2.2 Soomaa National Park, Estonia

7.2.2.1 Soomaa history and natural value

Soomaa National Park is one of the youngest in Estonia, the second largest after the Lahemaa National Park, and is located in South-West Estonia between Pärnu and Viljandi (28). The site is a large, flat area comprised of an integral complex of four bogs, wooded meadows, the naturally meandering rivers of the Pärnu River basin, and with floodplain grasslands that cross the area. There is one relict lake (6ha) which is dystrophic, and numerous bog-pools. Woodland covers 37% of the park, mires 54%, and grasslands cover 4%. On the eastern margin of the national park lie the highest dunes on the Estonian mainland, situated some 50 kilometres off the contemporary coastline. The Ruunaraibe Dunes are the highest of the area. The dune ridge, winding from northwest to southeast is a 1.2km long sand ridge, whose maximum height is 12 metres.

The park was created to protect the largest and best preserved natural raised bogs in Europe – “soo maa” translates to “bog land” from Estonian. Kuresoo Bog is one of the two best surviving large raised bogs in Estonia with high species diversity. It has a steep southern slope, rising 8m over 100m. Estonians have a tradition of using snowshoes as the easiest way of moving over these wetland landscapes.

During periods of heavy rain or the melting of snow, large amounts of water run down the Sakala Upland through the rivers of Soomaa. The rivers overflow, flooding the plains, but also over villages and the roads connecting them. In some years, the spring floods have risen by a meter a day for 3–4 days. The Riisa flood area is formed in such a way, covering 175 square kilometres at its largest and engulfing the national park, making it the biggest flood area in Estonia. The steep-sloped, raised bogs of the park stand as islands in the water.

The meadows, mires and forests of Soomaa offer good habitat for more than 180 bird and 43 mammal species. Birds include Bewick's swans, cranes, whimbrel, golden eagle, golden plover, dunlin, merlin, willow grouse, and Montagu's Harrier. The alluvial meadows and forests that cover the riverbanks are of great botanical value, and the wet woodland carrs surrounding the site are also of interest.

Large wild mammals, like moose, wild boar and the large predators — bear, wolf and lynx - are common in Soomaa (29). About 12-15 lynx live around Öördi and Kikepera Bogs, in the area of Ruunaraibe Dunes, and in part of Kuresoo Bog. These areas have a higher than average population of roe deer and are thus important feeding areas for both the lynx and wolf. The favourite food of the lynx, however, is the white hare, but its population is small. The lynx is under strict protection (30).

During the winter months of snow, the number of wolves in the park has ranged from none to eight animals. Their activities take place for the most part outside the national park area, but there are one to two pairs of wolves living in Soomaa on a regular basis. The wolf prefers to prey on wild boar and roe deer in winter, but they will also take beaver.

There are as many as 5-6 brown bears in the national park. Their options for hibernation within the park are limited by the potential for flooding, but one den is located in the southeast of Kikepera

Bog. The likelihood of seeing a bear increase when the summer berries are ripe, but before and after hibernation, they prey on elk in order to gather strength.

Beavers were reintroduced into Soomaa in 1982 when they were set free at the mouth of the Pääsmaa stream to the River Halliste. The first permanent beaver dens were formed on the Tõramaa River in the area of Kõrtsi Tõramaa. They can now be found in all bodies of water in Soomaa, with 140 counted in 2001. The damage done in Soomaa by the beaver is small. On bigger rivers the dams built by the beaver have for the most part a positive effect, and only valuable trees, like the oak, have had to be protected. Beaver activity is beneficial to streams, ditches and canals from the point of view of improving water wildlife and ecosystems, as well as that of waterfowls, amphibians and semi aquatic mammals. It is sometimes necessary to lower some beaver dams in order to lessen any negative consequence on the floodplain and drained peatland forests, which because of the very slight fall of the ground could be damaged.

Numerous findings, such as bone and horn arrowheads, fishing spears and fish hooks, stone wedges and axes, provide evidence of the fact that the Pärnu River together with its tributaries was one of the most densely populated areas in Estonia during the Middle and early Stone Age (31). Stone wedges, axes and hole stone disks originating from this period have been found in the Riisa village in Soomaa. A stone barrow dating from 2000 BC can be found in the southern part of the park.

Written reference to settlement in Soomaa dates back to 1588. Villages began to grow in the late 19th century, but conflict across Europe in the mid-20th century led to deportations, leaving farmsteads abandoned. The population of the bigger villages dropped by 90% over the last 60 years.

People living in Soomaa adapt to living their life according to nature. In villages it was said, there are five seasons, spring, summer, autumn, winter and high water. The small community living within the national park knows how to live together in isolation. Cut off from the rest of the world during floods, the people have been forced to keep their traditional skills. So the few people who live in the villages in the national park still bake their own bread, and they have cattle and other livestock. Also the tradition of carving dugout boats – *haabjäs* - from aspen trees has been kept alive.

In 1999, a total of 99 people lived in Soomaa, 93 split between the villages of Tipu, Riisa and Sandra. Six people lived on the left bank of the Navesti river. In addition to the permanent population, a number of summer homes increases the population during the summer months. Less than 10% of the park area is privately owned, with a third of that being farm woodland. Only two local roads cross the park.

Before the park was established, the area was a hunting ground for about 150 hunters, their annual take of 100 animals included moose, roe deer, wild boar and game birds. There was also hunting of wolves. Fishing started in spring with pike. As well as hand rods, many trapping systems were used including weirs.

7.2.2.2 Establishment and supervision of Soomaa National Park

Recognition that the Soomaa area had been one of the least affected by human activity led to a regulation in 1981 that created a protection regime for the four main bogs of Kuresoo, Valberga, Kikepera and Öördi (see Fig. 7.4). Designation of the 390 square kilometres of the national park followed in 1993 with the aim of preserving the area's natural values on a landscape scale. From the very beginning, the main management objective had been the protection of the territory's species, and the conservation of the undisturbed forests, bogs and floodplains of the area, along with their cultural heritage. Economic activities and use of natural resources would be in accordance with conservation principles in the national park, and in a manner and to an extent that did not harm the

park's nature, nor significantly affect the general appearance of the landscape in Soomaa National Park.

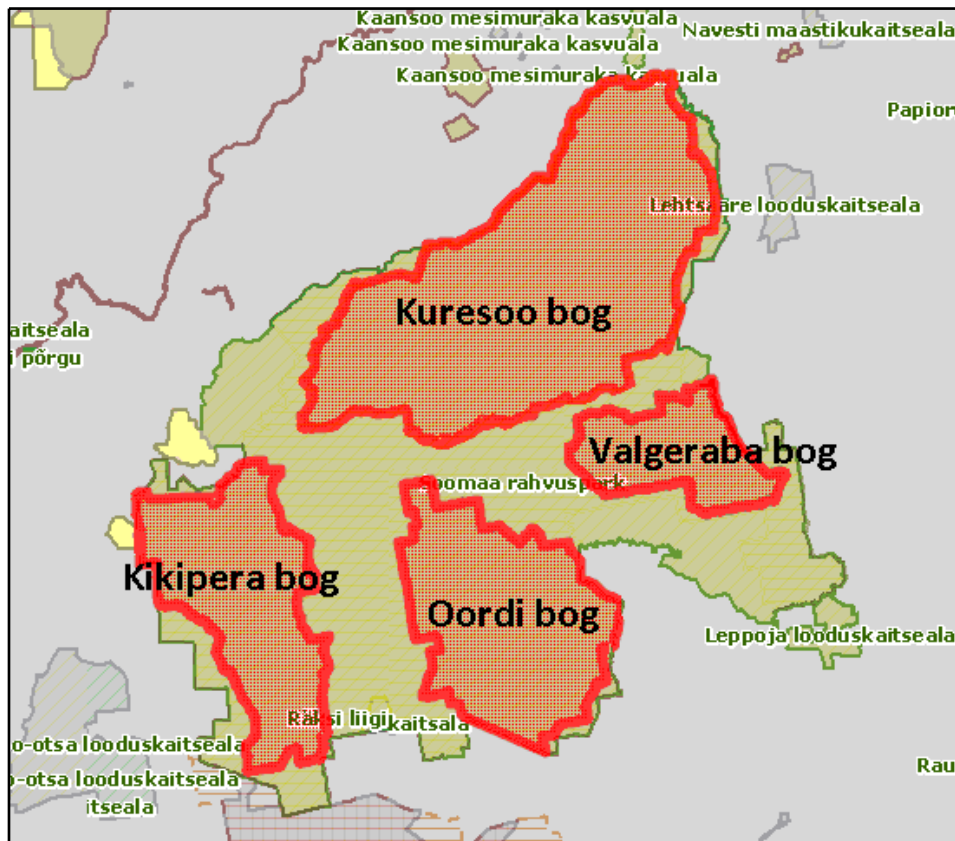


Figure 7.4 The four bogs inside the Soomaa National Park. From the Ministry of Environment, Estonia

Protection rules for the park were approved by regulation in 1995, updated over the years, and constitute the main legal act establishing the protection regime (32). These regulations give the objectives of protection, and explain the division of park into zones having different limits to land use: there is one strict nature reserve, twenty nine conservation zones and one limited management zone.

The general principles of the Protection Regime specify permitted activities in the park, and usually set out the areas where they can take place, such as the gathering of berries, fungi and other forest by-products in conservation and limited management zones. Driving motor vehicles is allowed on the roads of the national park, but not off road. You can take a boat on park waters as long as it doesn't have a motor. Camping and camp fires are only allowed in places specially prepared and marked for this purpose. The Prohibited Activities and the Approving Activities in the regulations in effect give authority for development and planning within the park to the National Park Authority.

It is interesting to see that the regulations lay out the range and definition of the zoning of the park. Thus a Strict Nature Reserve is *"a land or water area whose natural status is unaffected by direct human activity and where the preservation and development of natural biotic communities is ensured only through natural processes"*. There is only one, small strict nature reserve in the park, located in the Kikipera Bog and where all types of human activity is prohibited, except for conservation management and research works.

The conservation zones cover a much larger area of the park, and their aim is to conserve the natural and semi-natural habitats that have evolved and developed. Economic activities, the use of natural resources, and any new construction works are prohibited in all of them, and there are also seasonal restrictions on camping in some of the conservation zones. From that base of restriction, activity in the conservation zones diverges, allowing greater management intervention and use.

Of these conservation zones, the four largest don't require any management. These are the main bog areas that take up 60% of the park area, and which were those areas that first got protection in 1981 (see earlier and Fig. 7.4). The remaining conservation zones are where secondary habitat is maintained through thinning of tree and shrub layers, and mowing and grazing. The last zone is the Limited Management Zone where economic activities are permitted, and construction can take place. It is a protected landscape that snakes through the park around the other zones, and contains most of the private land.

The different zones can be seen in Fig. 7.5. They are reported in terms of classification into IUCN categories as following:

Strictly protected zone of National Park (Category Ia)

Wilderness area of National Park (Category Ib)

Habitat/species management area of National Park (Category IV and V)

Limited management zone of National Park (Category VI)

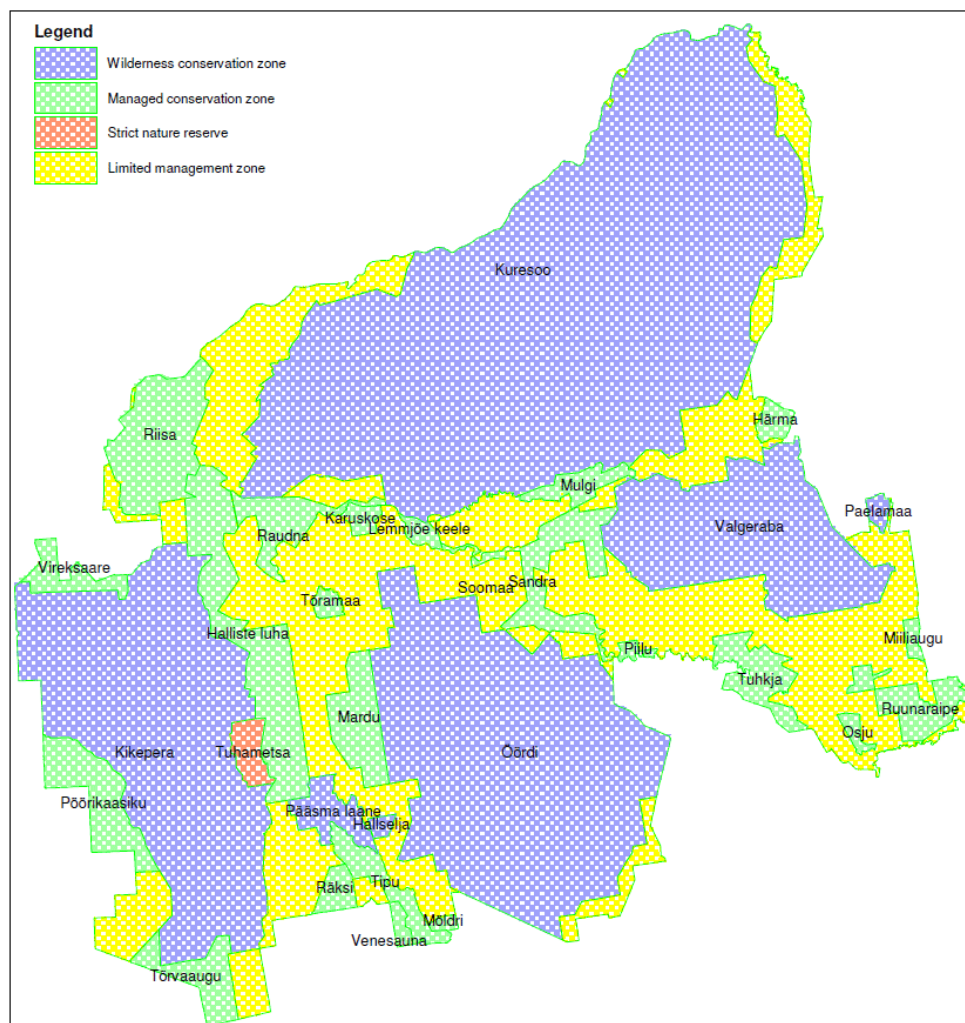


Figure 7.5 Zoning of Sooma National Park. From the Ministry of Environment, Estonia

Soomaa National Park is a state institution, administered by the State Environment Board and State Forest Management Centre. A visitor centre is located in the middle of the park, built on the ruins of an old farm. Trails are marked and maintained. Accommodation on the periphery of the park, guided tours and other activities in Soomaa National Park are organised by private companies. The park caters for around 45,000 visitors per year, and is financed from the state budget through the Ministry of the Environment. Staff are located in the visitor centre and in the Pärnu-Viljandi Region Environment Agency.

The park has established a special infrastructure for the general public to visit and experience the bogs of the four wilderness areas. Boardwalks of different lengths have been installed, leading to various parts of the bogs and forests of the national park. Access to the boardwalks is regulated during the breeding season for wading birds.

7.2.2.3 The management plan for Soomaa National Park

The current management plan for the Soomaa National Park runs for the period 2000-2010 (31). It has extensive descriptions of the park, its history, traditions and heritage, way of life, use of natural resources (forestry), hunting, fishing, and agriculture. It covers the visitor attractions, the nature and hiking trails, and the campsites. The values and objectives section has comprehensive detail on the habitats and species of the park, and particularly of the hydrology, and the objects for protection of these elements. Very detailed management activities are described that cover both the natural and cultural aspects of the park, infrastructure developments, proposals for monitoring and research, and staffing and budget implications.

The management plan makes it clear that Soomaa National Park is no longer a hunting ground. Wild animals can be managed if needed, but in accordance with the Hunting Management Act and the regulation for the Procedure for Hunting in National Parks and Nature Reserves. With the ban on hunting, the park thus serves as a refuge for brown bear, wolf, lynx and moose.

Fishing takes place in the park in accordance with the Fishing Act, and a permit is required. Fishing is limited by the restrictions on what equipment and bait can be used. There is no commercial fishing allowed.

The management plan is integrated into local and regional planning documents, and there is the aim to work with all local stakeholders to fulfil the plan, as well as contribute where possible to the aims of the local development plans of the two county authorities next to the park. Stakeholder involvement comes through representation on a council for the national park. It is recommended that scientific institutions and nature conservation organisations are represented on the council. It should be noted that an expert group of 50 people are acknowledged for their contributions to the management plan, including two professors.

Soomaa National Park also has Natura 2000 designations for bogs (7110) as well as for lakes and ponds (3160) and transition mires and quaking bogs (7140). It is designated for otter under the Natura 2000 system, and is a Ramsar wetland site.

7.2.2.4 Soomaa National Park and its core wilderness area

Soomaa National Park joined the PAN Parks network of wilderness areas in 2009, and gave the network its first freshwater protected area (33). The location identified in the park for the core wilderness area needed for it to become a PAN Park was the Kuresoo Bog, the largest of the Soomaa bogs (it is the wilderness area that fills the top of the park – see Fig. 7.4). The park was helped to

realise the unique tourism potential of the well-developed trail system and the wilderness experience it provides for visitors through successfully combining with local tourism businesses in creating its Sustainable Tourism Development Strategy, a requirement of the PAN Parks process during verification. On completion of verification, the PAN Parks certification team stated that Soomaa National park was of European importance in terms of its size, quality of preserved nature, cultural resources of the region, as well as management effectiveness (34).

Soomaa National Park offers a clear picture of how a landscape with a long history of cultural use, but also with the powerful natural force of water influencing it, can balance preservation of tradition and culture with restoration of natural processes on a large scale. The two are able to exist side by side through careful spatial division, and at a ratio that works in favour of wild nature, combined with a thoughtful and informed approach to the limits of activity in each area.

The professionalism, coupled with aspiration has, over the short space in time since designation of the park, made it a valuable asset in the state network of protected areas in Estonia. More than that, it has created a core area supported by other large areas within the park where keystone species can reveal the full extent of their behaviour and influence, whether it is on land (the large carnivores, the wading birds) or in the extensive water system of the park (beavers).

A number of aspects were likely key to the parks success: the extant natural value that had potential for whole system restoration; predominantly public ownership of the park area; legislation for a national system of protected areas that provided the right " *toolbox*"; and state support for a professional approach through funding for staff and management, and through Ministries and state agencies.

7.3 Summary and Conclusions

The Cairngorms National Park and Hardangervidda National Park have many features in common: a large mountainous area having few roads or infrastructure, and a nature conservation value existing alongside a range of recreational and extractive uses. Sheep farming has in both places had a fundamental impact on the native vegetation, alongside respective wild deer populations, namely red deer and reindeer. They differ in that the Hardangervidda is larger and has remnant glaciers and ice caps, many lakes and ponds, and nearly half its area is state owned. The Hardangervidda also has extant keynote species in brown bear, wolf, wolverine, and arctic fox. The Cairngorms National Park on the other hand also encompasses substantial settlements in a periphery to the mountainous area.

The conservation issues facing the two parks for their mountainous areas are similar in trying to balance the extractive and recreational use with the natural value of the location, and keeping it clear of unnecessary or inappropriate physical development and infrastructure. On balance, the ability to regulate extractive use is greater in the Hardangervidda National Park by virtue of the regulatory framework in place, including other layers of legislation that have jurisdiction, and by the ability through state employees to monitor and seek enforcement. Even so, there are still concerns for the Hardangervidda that the right weight is not put on safeguarding and maintaining areas of natural value that are essentially free from modification when there is every potential to do that.

The Hardangervidda National Park management approach is based on zonation, with some differential of activity between zones. While this zoning has some basis in ecological function and land use history, it seems too simplistic in terms of being able to deliver more discriminate aims. Nevertheless, it does give example of what could be an approach within the Cairngorms National Park, where zoning would bring a greater spatial focus to management planning.

Rannoch Moor and Soomaa National Park have common wetland characteristics in abundance and a similarity in recreational use. However, they differ in an inverse proportion of public ownership (only 10% of Soomaa is in private ownership) as well as in their objectives as protected areas. A safeguard for natural value from extractive use applies to over 60% of the area of Soomaa National Park, whereas the SSSI designation of Rannoch Moor has no presumption against that use. Any further comparison – such as in terms of natural values, management approach, regulation, governance and funding - would be an unnecessary exercise other than to provide an exemplar that given more favourable circumstances and commitment, Rannoch Moor could aspire to.

Getting the right balance between natural values compared to cultural values (nature conservation and human use) is the key aspect of a successful protected area for wildland. There should be a clear separation of these so that they can then be brought back together through the spatial integration of zoning i.e. natural zones, cultural zones. This requires having clear aims and a means to bring them about, backed by the right legislation and a protection regime and with the involvement and the powers of a specialised regional or national administration authority acting within a national system of protected areas. An ideal for this could be as follows, influenced by the forgoing analysis and by the experience of the PAN Parks network.

In terms of the management plan, it is important that many experiences are brought to bear, that there is a fundamental understanding of the ecological processes that exist in the wildland, and that value is given to the wider experience of successful protected areas, as much as it is to local knowledge and experience.

The management plan should have a long-term conservation strategy, aided by regulations that are adequately enforced, and an effective management structure in place. It should include a spatial approach for the protection regime, demarcating areas of different intensity of activity according to the degree of their preservation objective, and ensuring that there is restoration towards meeting the 75% rule for the aim of the IUCN category in which the protected area is classified. Where there are elements of private ownership, there should be an incentive based strategy on how to reach agreement with land owners and other key stakeholders. The plan should allocate staffing and funding resources, and be subsidised through the support of a national protected areas system.

Visitor management is also a safeguard for natural values, and is way of providing a quality experience based on the appreciation of nature. Thus a visitor management plan should be in place that supports the conservation goals, and which is actively implemented and regularly monitored. It should recognise the different types of visitor and match these to the range of activities available for the appreciation of nature. There should be a Code of Conduct for visitors.

CHAPTER 8 THE FUTURE FOR SCOTLAND'S WILDLAND

This chapter presents a series of key opportunities and recommendations for consideration in developing future policy and action on wildland in Scotland. It begins by applying the approach from Chapter 5, of identifying wildland through exploring the top end of the wildland continuum.

8.1 The Wildland Quality Index and protected areas in Scotland

A map of the top 5% WQI was used to distinguish between protected area systems in Europe that best captured wildland (see section 5.1). It was concluded that the protected areas classified as IUCN Categories I and II provided the best fit. Scotland does not report any protected areas in those categories (see section 4.5) but it is nonetheless important to evaluate whether any of the designation types of the existing protected areas has any congruence with high wildland potential. While using only the top 5% of the WQI may seem a high hurdle to set for these designations, it would be consistent with the average proportion of wildland area that is protected under IUCN Categories I, II and III (see Table 5.2). An explanation of the GIS modelling of Scottish wildland is given in Annex 2.

The top 5% WQI layered over the wildland continuum map in Scotland is shown in Fig. 8.1, where it can be seen that the majority of the high WQI is found to the west of the Great Glen. Since the two national parks are on the eastern side of the Great Glen (see Fig. 8.2) then it would appear that they are outside of significant areas of high WQI.

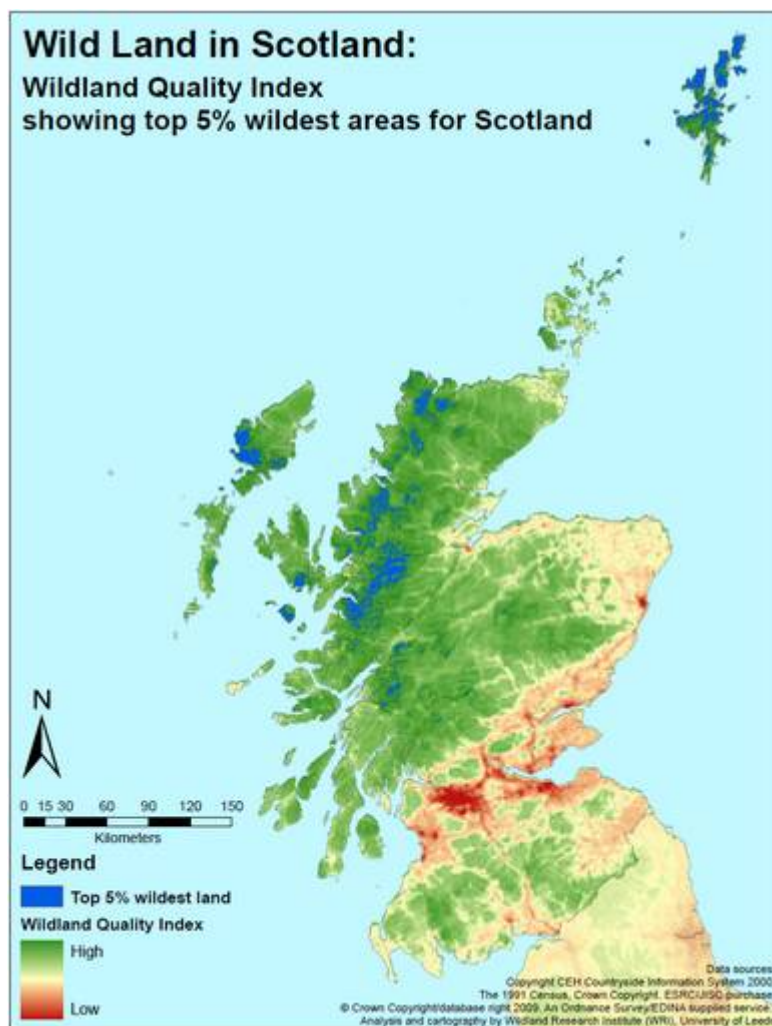


Figure 8.1 The top 5% WQI in Scotland

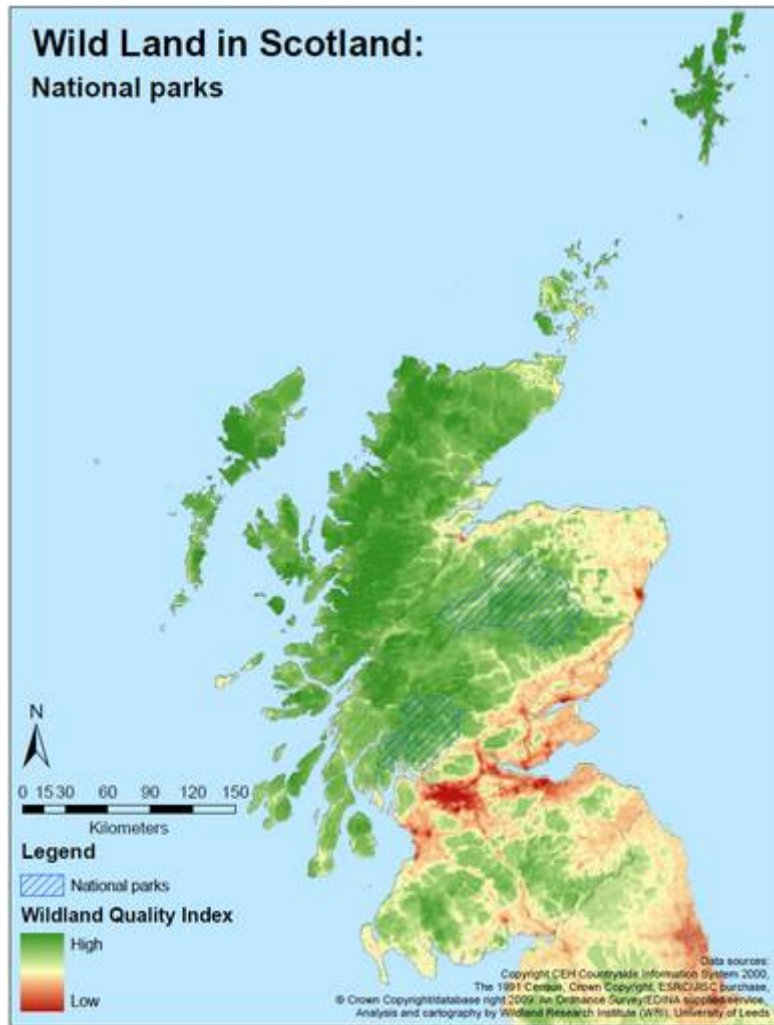


Figure 8.2 National Parks in Scotland

Visual inspection shows there to be a number of overlaps between SSSI protected areas and high WQI (compare Fig. 8.1 with the SSSIs shown in Fig. 8.3). However, it is a case of both inclusion and exclusion as the large number of SSSIs in the Flow country in the north are not matched by areas of high WQI, whereas overlaps between SSSI and high WQI can be seen in places like the Cuillin Hills, Wester Ross, Easter Ross, and Glen Affric.

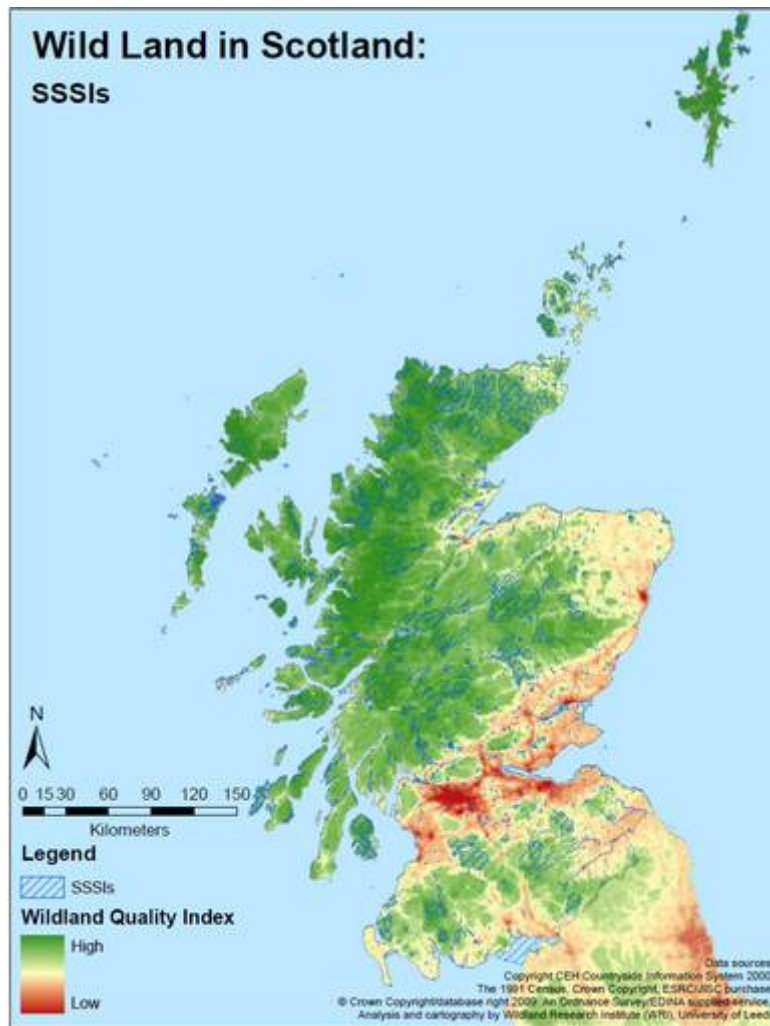


Figure 8.3 Sites of Special Scientific Interest in Scotland

Amongst the international designations, there is some very small overlap of SPAs in the Cuillin Hills, South Lewis, and at Beinn Dearg between Wester and Easter Ross (see Fig. 8.4). SACs fare a little better with overlaps in North West Sutherland, Cannich, Rum, South Harris, Bienn Dearg, Ben Nevis and Glen Coe (see Fig. 8.5).

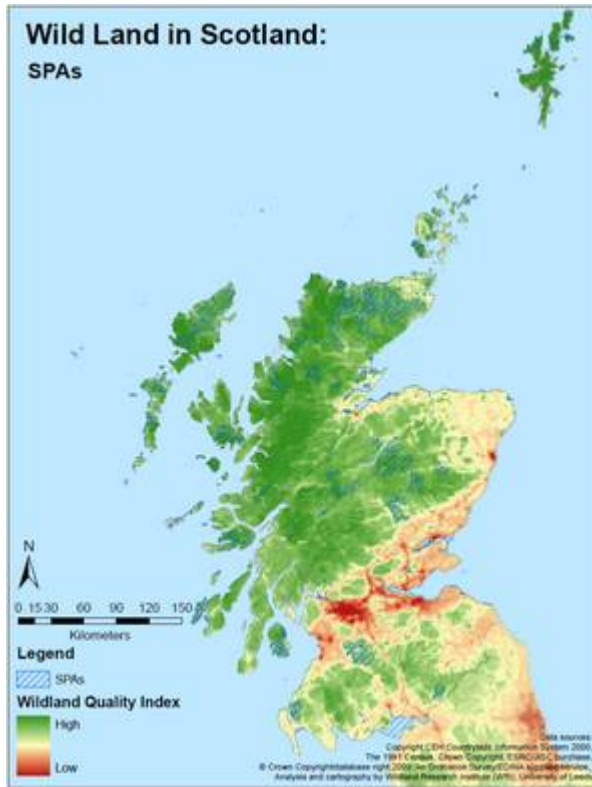


Figure 8. 4 Special Protection Areas



Figure 8. 4 Special Areas of Conservation

There is almost no correlation between Ramsar wetland sites and areas of high WQI (see Fig. 8.6 for the Ramsar sites).

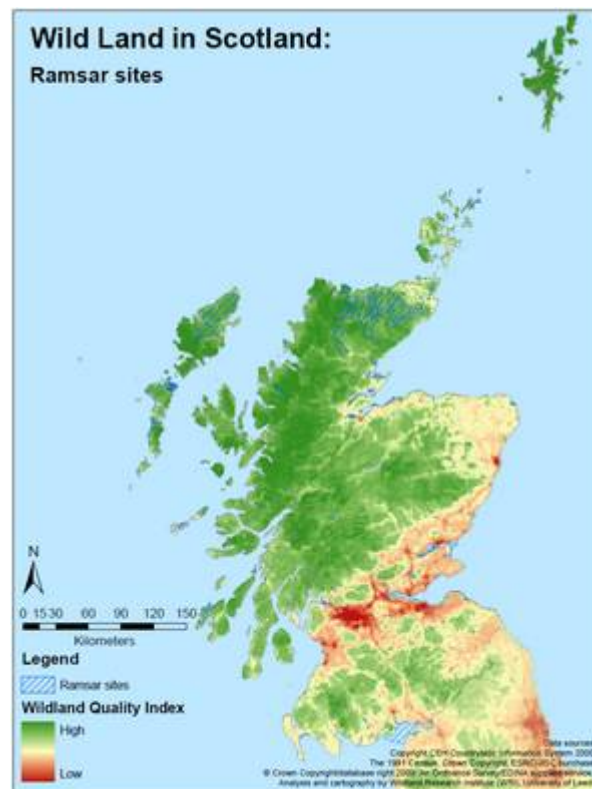


Figure 8.6 RAMSAR wetland sites in Scotland

By far the greatest overlap with the top 5% WQI is shown by the National Scenic Areas (NSA – see Fig. 8.7) with almost all the NSAs to the west of the Great Glen having a significant area of high WQI within them. This includes the Cuillin Hills, The Small Isles (Rum), South Lewis, Harris and North Uist, Assynt – Coigach, North-West Sutherland, Kyle of Tongue, Wester Ross, Knoydart, Kintail, Glen Affric and Ben Nevis and Glen Coe.

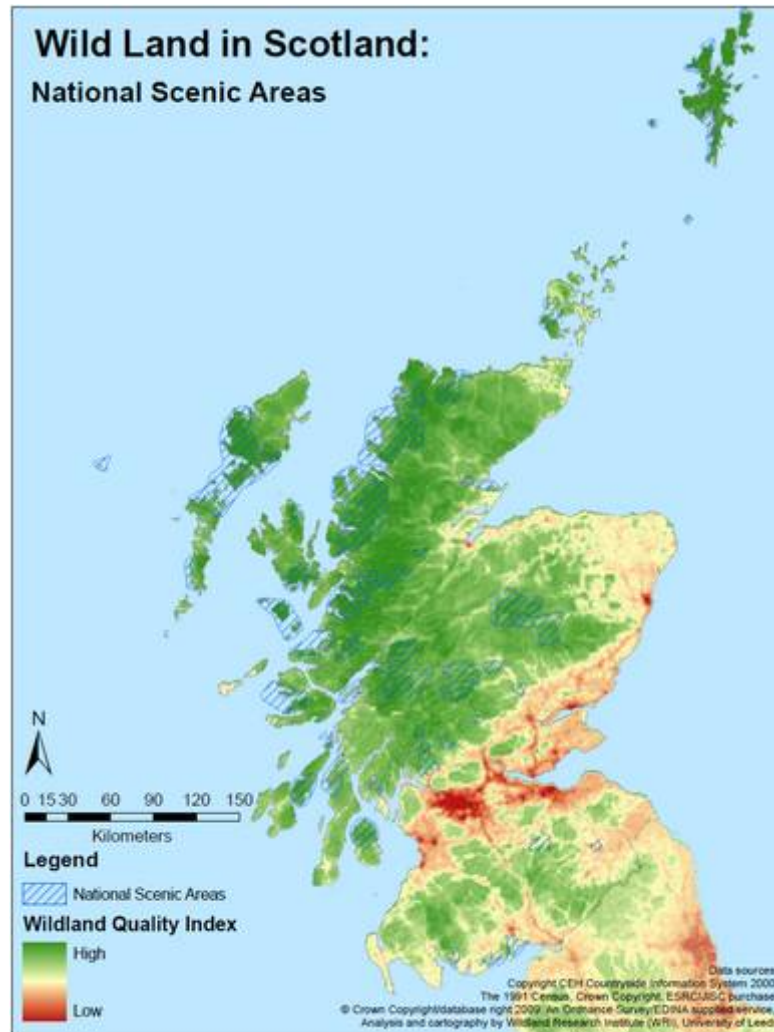


Figure 8.7 National Scenic Areas in Scotland

By computation, 50% of the top 5% of wildest areas in Scotland are found within existing NSA boundaries. When the potential search area for wildland is increased by using the top 10% WQI, the area found within NSA boundaries is 46%. This would suggest that there is not a straightforward concurrence between WQI and NSAs, and it is the case that there are notable exceptions of the top wildest areas lying outside the NSAs. These include the Glen Strathfarrar, Glen Orrin and Glen Carron area, the Fannich, Braemore and Strathvaich Forests to the north, the upper reaches of Glens Kingie, Dessary and Pean in the Lochaber area, and Strath Dionard and Glen Golly in the far north west.

8.2 National Scenic Areas and wildland

As was explained in section 4.5.3, NSAs were established in the early 1980s by order of the Secretary of State under planning legislation. Their aim was to provide protection and enhancement for those outstanding areas of Scotland's scenery that were also under heavy recreational and related

pressures, like the very popular locations of Loch Lomond and the Trossachs, the Cairngorms, Ben Nevis and Glencoe.

In 1999 SNH undertook a review of the NSA designation and issued a consultation paper (1). One of the outcomes of the review was a recommendation that management strategies be produced for each NSA (2). Such strategies would involve all those with an interest in the NSA and would identify the action needed to safeguard the valued qualities. In winter 2000-01, SNH in partnership with local authorities established projects in Wester Ross and Dumfries & Galloway where the production of management strategies was trialled. These pilot projects resulted in strategies for the Wester Ross NSA in Highland and for the three NSAs in Dumfries & Galloway. Difficulties were encountered in Wester Ross, where insufficient support was gained from all stakeholders, but the work continued in Dumfries & Galloway where a full-time NSA officer now oversees the implementation of the three management strategies.

A conference on NSAs was held in 2007 hosted by the Scottish Government and SNH (3). Delegates from local authorities, national parks, tourist interests, enterprise companies, and conservation organisations, focused on the management of NSAs, on the application of the legislative change in 2006 that gave NSAs a statutory basis, as well as raising awareness of NSAs.

Prior to the conference, SNH had contracted consultants to develop a method that could be used to determine the special qualities of each NSA. A team would visit all the NSAs and apply the methodology, which would thus be an updating of the original descriptions in the document Scotland's Scenic Heritage from 1978. The objective was to provide a firm basis for developing management strategies; give local authorities a clear idea on what policies will be needed to safeguard the character and appearance of the NSAs in their area; and enable better targeting of rural grant schemes to the objectives of NSAs.

As was explained in section 4.4.1, an aspect of the fieldwork would be recording observations on visual experience and emotional response, with a particular reference to keywords supplied, including such as:

"exhilarating, inspiring, exciting, awesome, challenging, surprising, spectacular, dramatic, turbulent, unsettling, uncomfortable, wild, remote, isolated, undiscovered, secret, mysterious, tranquil, peaceful, hidden, idyllic"

When the results of this survey are made available, it would be interesting to analyse the fieldwork data with some attempt at putting parameters on the responses that may refer to a wildland characteristic. While it would be an unreliable conclusion, it may be possible to use that exercise to delineate NSAs with a high wildness characteristic, and compare that to the distinction identified in the previous section between NSAs that encompassed significant areas of high WQI from those that don't. Would this parallel the divide identified either side of the Great Glen?

Even though the legislation that underpins them was updated in 2006, there is little statutory protection afforded to NSA's other than guidance for development management (development control) given by Government to local planning authorities. Within NSAs, there are some areas where SSSI designation overlaps, and this may be an overlap also with areas of high WQI inside NSAs. This would bring an extension to the protection regime in regulating activities that may harm the features for which the SSSI was designated. However, as was noted in Chapter 4, SSSIs are not intended to safeguard wildland along the continuum, as the protection regime is either based on species and habitats, rather than whole area protection and restrictions on extractive land use (see section 4. 5).

It has to be concluded therefore, that in their present legislative form, there is an insufficient regulatory framework for NSAs to function as protected areas for wildland as they do not have a clear and enforceable regime that gives the right balance to protection of natural values compared to cultural values, that is backed by a management plan that includes a spatial approach, and by staffing and funding resources, all these being identified as the mark of a successful approach to a national protected area for wildland (see section 7.3). It would, anyway, be unrealistic to expect this of NSAs when they are overwhelmingly in private ownership, and where recent difficulties with securing stakeholder support indicates that they would not attract a high degree of voluntary involvement.

There is however movement to give NSAs greater prominence within the Scottish landscape designations by the trialling of management plans, and the application of staff resources. Thus it has to be recommended that NSAs could take on the role of protecting and promoting areas of land with a wildness characteristic, a point on the wildland continuum that still leaves scope for areas of greater wildness within.

8.3 An ideal for protected area legislation

Wildland may be embedded in the policy on nature and landscape in Scotland, but it is imprecisely defined, leaving it vague and unyielding to an understanding of functional reality (see section 4.4.1). The current legislation supporting terrestrial designations in Scotland, even though its development was contemporaneous with the evolution and development of that wildland policy, was not intended or structured to safeguard wildland (see section 4.5.9) and perhaps it could not, considering the intractable nature of the definition advanced in policy at that time. However, the recent Act for marine conservation in Scottish waters provides for the first time, a framework of nature protection that compares to the legislation for national protected areas systems in continental Europe that safeguard wildland.

The Marine (Scotland) Act 2010 gives new powers to select and manage Marine Protected Areas (MPAs) for the protection and enhancement of marine biodiversity, and for research. It is worth looking closely at the provisions in that legislation (4).

Section 68 enables Scottish Ministers to designate by order a Nature Conservation Marine Protected Area (MPA) for the purposes of conserving marine flora or fauna, marine habitats and features of geological or geomorphological interest.

Section 79 requires the formation of a network of Nature Conservation MPAs that contributes to the conservation or improvement of the marine environment in the UK marine area, and which represents the range of features present in the UK marine area.

Section 85 enables Scottish Ministers to make marine conservation orders (MCOs) to regulate activities in MPAs in order to further their objectives and purposes. Under that section, different provision can be made for different parts of the protected area, for different times of the year, and for different means or methods of carrying out any activity.

Section 86 gives example provisions that can be included in MCOs. It sets out examples of activities that can be prohibited, restricted or regulated within the MPA through the making of a conservation order. Included in these are:

- entry into or movement, and activity or works in the protected area by persons or vessels
- anchoring of any vessel
- killing, taking, destruction, molestation or disturbance of animals or plants of any description in the protected area

- removal of all or part of any thing
- depositing (by any means) of anything in a protected area
- doing anything in the protected area which, in the opinion of the Scottish Ministers, may interfere with or damage the seabed, damage or disturb any object or otherwise cause harm to the protected area.

Section 95 makes it an offence to damage any protected feature of a Nature Conservation MPA, including intentionally or recklessly killing or injuring any animal; picking, collecting, cutting, uprooting or destroying any plant; taking anything from the MPA which is part of the protected feature; and damaging or destroying any habitat or feature which is protected by the MPA.

Section 132 outlines the powers that marine enforcement officers have for the purpose of enforcing the MCOs.

Thus the legislation provides for designation of an area for nature conservation (S.68); requires a conservation order that sets out the natural value, and which provides the ability for that area to be zoned (in space and time) to demarcate different restrictions on activity (S. 85); gives example of those restrictions, and which can provide for a complete ban on extractive and disruptive activity (S.86); makes it an offence to damage the protected area (S.95); and puts in place enforcement for the protection regime (S. 132).

Taken all together, these provisions can be interpreted as providing the basis for designating a strict nature reserve as a measure for conservation of “wild sea”, where natural forces are undisturbed. This is usually known as a “no-take zone” and has been the cornerstone of marine conservation in New Zealand since 1975 (5). That there is no private ownership of the open sea under national jurisdiction works to the advantage of any legislation restricting extractive or harmful activities, although it is a requirement of the marine act that consultation is carried out with commercial interests on the designation of Nature Conservation MPAs.

In its structure and intent, the provisions for Nature Conservation MPAs have the potential to designate for a terrestrial strict nature reserve – a land-based no-take zone. These would have great similarity with IUCN Category Ia in the guidance, as it would also with the provisions for strict nature reserves in the legislation of countries that base their protected area system on the IUCN categories of protected areas (see sections 5.3 and 5.4.1). It is possible also to envisage that through a variable approach to restriction and the use of zoning, that other categories of the IUCN system could be designated through these provisions, such as Category Ib wilderness, and Category II National Parks that may or may not have Category I core zones.

Another connection is that the marine legislation requires the formation of a network of Nature Conservation MPAs (S. 79) and this is also found in the protected area legislation of many European countries (see section 5.5). The dissimilarity for the terrestrial application is in the reversal of ownership between land and sea in Scotland. As was seen with the legislation and policy of national protected area systems for wildland, public ownership was a distinct advantage in being able to implement and build a portfolio of protected areas of wildland (see section 5.6). The predominance of private land ownership in Scotland would require the consent of that ownership.

It is not the suggestion that new legislation should be sought for with in Scotland to safeguard its wildland, but it is the case that the adequacy of existing legislation should look to the example of this marine legislation, as well as terrestrial legislation for protected areas in continental Europe. Thus any future proposals should adopt the approach of Hungary. During the process of drafting their Nature Conservation Act in 1996, they analysed the nature conservation laws from 20 other

countries, “which were all translated into Hungarian”(6). This thorough, comparative approach is the basis of the current study.

8.4 Non-legislative protection for wildland

It is not always the case that designation and protection of wildland that is classified under the IUCN categories has legislative backing. The six national parks in Ireland are publicly owned and managed under a number of Acts, including the State Property Act, 1954 (7). However, their administration by the National Parks and Wildlife Service is on the basis of being Category II National Parks. The absence of legislation specifically for the national parks was referenced in the National Biodiversity Plan of Ireland in 2002 (8), and an action point to introduce legislation to provide a legal basis for national parks was included in the Interim Review of the Implementation of the National Biodiversity Plan in 2005 (9), but legislation has yet to surface. The Netherlands also has no legislation for its 20 Category II National Parks (10). Ministerial orders provide the legal basis, and policy for the parks has been formulated in several national policy documents, including structure plans and other documents.

Examples are given in this section of where Scotland can use non-legislative processes to develop a protected area system for wildland. In the fullness of time, if these non-legislative processes prove successful, they may encourage a refreshing of current legislation.

8.4.1 Biosphere Reserves

Scotland has its own non-statutory protected areas, but in one case the designation is made by the United Nations Education, Science and Culture Organisation (UNESCO) under its “*Man and the Biosphere*”(MAB) ecological programme launched in 1970 (11). The reserves may be proposed by any community or organisation. The aim of the programme is to promote environmental sustainability through a World Network of Biosphere Reserves. Each Biosphere Reserve is intended to conserve nature; foster sustainable economic development; and provide the opportunity for education and training, and research and monitoring for issues of conservation and sustainable development.

The Biosphere Reserve concept has the reserve area divided into three zones: one or more core areas that are securely protected sites for conserving and monitoring minimally disturbed ecosystems; a buffer zone that surrounds the core zones and in which land use activities are compatible and do not harm the core area; and a flexible transition area, or area of co-operation where there is cooperation between stakeholders to sustainably develop the areas resources (12).

There are three Biosphere Reserves in Scotland - Cairnmore of Fleet/Silver Flowe/Merrick Kells, Loch Druidibeg and Beinn Eighe, all of which overlap National Nature Reserves (13). There are proposals for the Cairnmore of Fleet/Silver Flowe/Merrick Kells Biosphere Reserve to be developed into a wider Galloway and South Ayrshire Biosphere Reserve (GSABR) (14). At its core would be the 9,000ha of Merrick Kells SSSI/SAC which incorporates within it Silver Flowe NNR. This is a publicly owned area of moor, mountain and bog that is almost unpopulated. The buffer zone that surrounds the core is about 2-3 times the size of the core, incorporating part of the Cairnmore of Fleet NNR/SSSI, which is also publicly owned. The Galloway Forest Park exists throughout the core and buffer area, its 76,000ha are publicly owned. The transition zone spreads from Ayr in the north, nearly all the way to Stranraer in the West, down to Wigtown and Kirkcudbright in the south and over to Sanquar in the east. The area of the transition zone is perhaps 5-6 times that of the buffer zone. There is an excellent schematic and interactive mapping on the GASBR website that illustrates this zoning.

The extent of public ownership in the core and buffer zones, coupled with the low population in the core, would seem advantageous in setting out on a dialogue to marry a core nature zone with the cultural landscapes surrounding it. The proposals provide an exemplar of this zoning, a key facet of the approach of Biosphere Reserves, and which is lacking in most other UK Biosphere Reserves. It is this kind of zoning between core and buffer that is seen in France's National Parks system as a two-way virtue (see section 6.4.1) and it is no surprise that the development group for the GSABR visited Cevennes National Park in France, which is an established Biosphere Reserve (15).

The presence of the nationally designated protected area forming part of the core zone of the proposed GSABR provides some measure of a protection regime, and the significant public ownership is also a factor in being able to achieve the aim of that zone, and of the buffer zone. However, there is encouragement from the MAB programme for countries to incorporate Biosphere Reserves into their national protected area legislation, thus giving them a coherent framework for all the zones as well as a legislative basis for the protection regime.

In the survey of national protected area legislation for IUCN categories (see section 5.3), it was also found that 12 countries in Europe included legislation for Biosphere Reserves (Armenia, Azerbaijan, Georgia, Germany, Hungary, Latvia, Lithuania, Moldova, Romania, Russia, Spain and Ukraine). If there is potential for more Biosphere Reserves in Scotland, then this legislation from other countries will prove useful in understanding the protection regimes that they have put in place, and could inform proposals for new legislation. The MAB programme also provides a model law that includes detailed articles on designation, objectives, zonation and the partnership between public and private sector, and the integrated management of the reserve (16).

8.4.2 The application of IUCN protected area categories in the UK

The analysis in this report shows that the predominant protection of wildland in Europe is based on either legislative or policy support for classification under the IUCN system of protected area categories (Chapters 5 and 6). In a letter to the IUCN-UK Committee in December 2009, Nikita Loupukhine, the Chair of the IUCN World Commission on Protected Areas (WPCA), considered the UK to be lagging behind other European countries in the quality of its reporting of protected areas (17). He encouraged the IUCN-UK National Committee to work with its members and the wider protected area community to consider a more thorough use of the IUCN categories nationally. He said this was particularly important as the reporting of protected areas using the category system is a requested action under the CBD's Programme of Work on Protected Areas, to which the UK is a signatory.

The IUCN UK Protected Areas project held an expert workshop in London in February 2010 to discuss assignment of the IUCN categories to protected areas in the UK. The discussion highlighted the fact that, while the UK has numerous kinds of protected areas, they are not usually thought of as a national system, and there is confusion about the extent and variety of protected areas in the UK in terms of international reporting. The meeting explored using the internationally agreed IUCN Protected Area Management Categories as a tool to provide clarity about protected areas in the UK, and as a basis for reporting and communication.

The IUCN UK National Committee agreed to take the lead in developing an assignment process, using the latest guidelines from IUCN, produced in 2008. The project was launched to the IUCN membership in the UK at the WCPA workshop held as part of the IUCN-UK *"Nature - What's in it For Me?"* conference in April 2010. The presentation by Roger Crofts, WPCA, noted that only a few protected area types in the UK were reported under the IUCN Categories (see section 4.5) and that none were in Category I, II, III or VI (18) a finding that is confirmed in this study (see also Table 5.1).

The project – Putting Nature on the Map - is to be carried out over the period of a year, and is planned to begin in September 2010. At the end of the exercise in 2011, the Cambridge-based UNEP World Conservation Monitoring Centre (UNEP-WCMC), which runs the World Database on Protected Areas, will have a comprehensive digital and mapped record of the land and sea areas in the UK where nature and landscape are given priority. This information will be freely available to all decision makers in the UK, and updated as required (19).

As could be concluded from arguments given earlier in this chapter, Scotland (the UK) lacks any legislatively-based protected areas consistent with IUCN Categories I, II and III because its terrestrial protected area legislation was not intended or structured to safeguard wildland (see section 8.3). Thus any classification attempt will need to *look past* current designations to assess whether under their current management practice, the protected areas qualify or have the potential to qualify under the IUCN Categories I, II, III.

The opportunities for promoting certain designated areas as IUCN Category I, II and III will thus have to be on a similar basis of discrimination as that described for Natura 2000 sites and wildland, where a distinction is made between Primary and Secondary habitats (see section 6.2). It is generally regarded that non-intervention management succeeds in meeting the objectives of SSSI designation in the UK only for the few habitats that are outside of extractive use, such as the seashore, some sand dunes, rocks and screes, cliffs and ravines, some ancient woodland, a very few bogs and fens, and a very small part of our mountain top area.

For all the rest, the features notified for the greatest majority of SSSI designations derive from extractive or management activity in Secondary habitats that maintains those species and habitats in the face of the natural dynamics of whole ecosystems. These are currently classified as IUCN Category IV managed habitat reserves (see Table 4.1).

There are examples of local initiative either by statutory agencies, or by voluntary organisations with the concurrence of statutory agencies, where ecological restoration is taking place on individual units of SSSIs through exclusion of livestock grazing, combined sometimes with tree planting (see later). The timescale of this ranges from 10-35 years during which extensive change has occurred in the vegetation of these units, such that they are or will very shortly be failing evaluation under the Common Standards Monitoring guidance for SSSIs. Their continuing trajectory towards functioning whole ecosystems of a primary nature is thus outside of the current statutory process of nature conservation, and could be lost at any time if the support for these local initiatives is reversed. A change in habitat and species notification may in some cases forestall this threat, but it is not a long term basis for securing the classification of areas in the UK in IUCN Category I.

The other designations, such as Local Nature Reserves, and even areas without any recognition through area designation, that may be showing characteristics of ecological restoration from such as exclusion of grazing or non-intervention, also give scope for their classification under the IUCN categories. However, even the absence of statutory monitoring is not a safeguard against management reinstatement under the exigencies of the UKBAP.

8.4.2.1 Assignment of protected forest areas in the UK to IUCN categories

There already has been a comprehensive study that classified woodland in the UK under IUCN categories. The study was carried out on behalf of WWF and the Forestry Commission (20). It used indices of native-ness, ancient woodland status, extent of modification, protected area designation, scale, level of management intervention and the funding for this, and the implications of ownership to distinguish how much of the UK's woodland cover could be considered to have some measure of

protection, and then classified it in to the different IUCN categories. The study has some interesting findings for Scotland.

Out of the 2,841,000ha of woodland in the UK (21) the study concluded that 22.2% could be classified in IUCN categories, but only 2% would fall in Categories I, II and III. This represents only 0.2% of the land area of Britain. The authors concluded that increasing the area of near-natural forest under higher forms of protection was clearly a high priority, and that there was a need to increase the area of strictly protected woodland that was in genuine long-term minimum intervention. They pointed out though that our history of woodland management and deforestation in the UK would mean that opportunity for these categories was limited.

In deciding on classification, the study set criteria for selection, and gave example of where woodland areas could be found for each type:

CATEGORY Ia was assigned 7,000ha. These were non-intervention woodland reserves containing near-natural ecosystems, whose primary objective was the study of natural processes or monitoring the environment. No other uses, apart from incidental provision of ecosystem were acceptable. They had to be large enough to maintain the integrity of the ecosystems, and be free of direct human intervention. The area's biodiversity and genetic resources would be maintained without need for habitat manipulation. The authors conceded that historic modification was inevitable so that they would not be exclusively natural areas. As was argued in section 3.2.1, the debate on "*purity*" in the lead up to the passage of the Eastern Wilderness Areas Act in America created a better understanding that the most important thing for wild land is what happens now and into the future, and not necessarily what happened in the past. Lastly, ownership and control would be by a public body or with the close cooperation of such a body.

It was noted that these non-intervention reserves were once a key objective of the NNR series, but active management in many NNRs had increased, as the focus had moved from research and monitoring to the priorities of managed habitat conservation. However, examples were given in the report of reserves that had have been treated as non-intervention and in which a limited amount of long-term research had been undertaken. The prime UK example was Lady Park Wood NNR, but in Scotland, Black Wood of Rannoch (SSSI) and Clairinsh Island, Loch Lomond (NNR) were noted.

CATEGORY Ib was assigned only 3,000ha. The objectives of management of these reserves would be about protecting "*wilderness*" for future generations. There thus would be an emphasis on the natural quality, and non-intrusive recreational uses. These would be large natural areas with limited human influence, and which would remain as such. The authors noted that the Cairngorms could have been an example of this if the mountains had not been deforested in prehistory by grazing and burning, and if they were not still maintained at a low level of woodland cover through management for deer stalking and grouse shooting.

However, Scotland did yield examples for this category, the study concluding that the nearest approach within woodlands would be the larger native pinewood reserves such as Abernethy, Rothiemurchus, Mar, Glentinar, Strathfarrar and Affric, even though it was noted that these woodland areas were nowhere near natural in composition or structure, and in any case their "*natural*" forest was somewhat fragmented and dispersed among managed ground.

They noted that attempts were being made to re-create large, natural wooded areas from the tattered remnants of original woodland, for example in the Creag Megaidh NNR, Glen Finglas, Glen Etive and Carrifran. However, it would be decades before these are tree-covered to the natural tree-

line, and centuries before they could be construed as natural. This does not mean to say though that *wilderness forest* of the future should not have their beginnings now.

CATEGORY II was assigned 20,000ha. This category would be national parks, their woodland having much in common with Category Ib (wilderness) areas, but with primary the objectives of conservation, recreation and the provision of ecosystem services. The category was intended for areas which are still in a near natural state and have a wilderness character. The authors concluded that having the word "*natura*" in the definition would, if interpreted strictly as the IUCN indicates, rule out even the wilder parts of the national parks in the UK. However, if natural was taken to mean "*near-natura*", and subject to very low-intensity management, then some areas may qualify, like the Caledonian pine regeneration areas of Glen Etive, Glen Affric and Abernethy.

CATEGORY III was assigned 27,000ha. This is the category where the protected area is usually small as it covers things like waterfalls, cliffs, gorges, knolls and lakes; rich or unusual woodland communities, rare or notable species and trees of character; and could even cover prehistoric earthworks, charcoal hearths in ancient woodland, and woodlands with legendary or literary connections or of historic significance. Protection and provision for recreation would be the primary objectives, and no exploitation which conflicts with this would be allowed.

While the authors showed an understanding of what this category applied to, it is not entirely clear on what basis they derived their allocation. It was perhaps the most difficult category to assign areas to without greater detailed knowledge of the suitability of myriads of locations. The presumption must be that they used a difference calculation based on ancient and other semi-natural woodland areas.

Of the other three categories assigned areas in the study, CATEGORY VI is the one that has the most implications for wildland in Scotland. The key characteristic of this category is combining the provision of ecosystem services and sustainable production from native resources with the maintenance of biodiversity. The authors, at the time of the study, assumed a numerical hierarchy in the IUCN classification that put Category VI at the lowest level of naturalness, which they found at odds with the definition given for the category. However, the understanding of the purpose of Category VI protected areas has advanced over the last decade, and the latest guidance from the IUCN makes it much clearer, as well as showing the relative position of this category in terms of naturalness (see Fig. 3.3).

In spite of their uncertainty, the authors based their assignment to this category on whatever semi-natural woodland that had not already been assigned to other categories, albeit that this woodland was likely to be plantations for hard woods. They thus excluded large commercial plantations with non-native trees. The area assigned to Category VI came to 100,000ha.

The authors made a range of recommendations based on their findings, including concern at the lack of data on woodland protection, and the need for more coordination between NGOs to ensure that there was a more cohesive role for protected ownership. They also made the proposal that there should be a stronger commitment to conservation in all publicly funded woodland, with all publicly owned ancient semi-natural woodland declared Public Nature Reserves. Private owners would have a voluntary mechanism for declaring their woodland under similar management considerations, and which would be declared as Private Nature Reserves. But the key message from the study was the high priority given to increasing the area of near-natural forest under higher forms of protection, and ensuring that this woodland was in genuine long-term minimum intervention.

8.4.2.2 The potential in Scotland for IUCN categories

The IUCN-UK assignment project described earlier will be reporting in 2011 on their mapping of areas in the UK where nature is given priority, and which could be classified under IUCN categories. It is worth however providing some pointers for likely areas in Scotland, in advance of that project.

The proposals for expansion of the Cairnsmore of Fleet/Silver Flowe/Merrick Kells Biosphere Reserve are lent considerable credibility by the extent of public ownership of the core and buffer area (see section 8.4.1). This is because the requirement for a securely protected core area for conserving and monitoring minimally disturbed ecosystems, and for a buffer area in which land use activities are compatible and do not harm the core area, are much more easily met if there isn't an overwhelming competing agenda of extractive use. The presumption is that public ownership, or beneficial ownership (which could be private), does not necessarily have the requirement to generate income from extractive land use.

This being the case it would make sense to look inside the portfolio of publicly owned and beneficially owned land in determining where there were areas in Scotland that could be assigned to IUCN Categories I, II and III. The obvious example would be the publicly owned forest estate in Scotland, and within which there are some very likely areas, not least the Galloway Forest Park which is a large part of the core and buffer area of proposed Biosphere Reserve. Some of the larger National Nature Reserves in public ownership may also have potential, and not just the ones on the public forest estate.

In reviewing the aspirational nature of the IUCN system, it was noted that important natural monuments can sometimes provide an incentive for protection and an opportunity for environmental/cultural education even in areas where other forms of protection are resisted due to population or development pressure (see section 6.3.1). Category III protected areas can preserve samples of natural habitat in otherwise cultural or fragmented landscapes, and could thus be a very important stepping stone into classifying in new categories of the IUCN system.

Of course this incentive is not just confined to cultural or fragmented landscapes, and the categorisation can be used to celebrate natural wonders wherever they arise. Thus the Old Man of Hoy, a coastal stack close to Rackwick Bay on Hoy, is a distinctive landmark in the Orkney Isles. It is relatively easy to see that natural monuments of similar presence, and which meet criteria, could be assigned to Category III. How they are protected in concert with the category depends on the circumstances. The lower waterfall at the Falls of Foyers, draining into Loch Ness would be another example, and their may be parts of the Geoparks that also could fall into this category (see section 4.5.7).

In terms of the public estate, the short circular walks in the core of Glen More Forest Park pass through high quality pockets of ancient Caledonian Pinewood (22), and thus could be considered for classification as a natural monument. In similar vein, the 16 Caledonian forest reserves (see section 4.5.5) may also be considered as natural monuments, or depending on their level of management intervention, they and the five Forest Nature Reserves (see section 4.5.4) may have potential for classification for one of the subcategories of Category I.

It should be noted that Black Wood of Rannoch and Glen Affric amongst the Caledonian forest reserves, were two of the woodland areas identified for classification in Category I in the study described in the previous section. Moreover, Caledonian forest in beneficial ownership should not be overlooked for its potential, such as the RSPB's Abernethy reserve and perhaps parts of the Rothiemurchus Estate where there is some voluntary commitment. Carrifran in the Borders was also

mentioned in the classification study, a result of community purchase and planting of a new, native wildwood after removal of sheep and wild goats (23). The Borders Forest Trust has now acquired the Devil's Beef Tub at Corehead near Carrifran, and plans to do the same ecological restoration there (24). Both these new wildwoods are perhaps the Category Ib *secondary wilderness* areas of the future.

The potential for classifying any Category II areas is perhaps more problematic because of the difficulty in identifying an area of sufficient naturalness and size to encompass a functioning ecosystem, and which has an administration that can provide and support recreational activities. The Core zone and perhaps most of the buffer zone of the proposed enlarged Galloway and South Ayrshire Biosphere Reserve would be a candidate on size, ownership and intent, and it may prove that the transition zone could think about designation as a protected landscape under Category V. However, it should not be the case that this is the ideal for a Category II National Parks since the classification is used by many countries for smaller areas that, while they are for recreation in natural landscapes, do not provide much in the way of park facilities.

The short term potential for Category II areas is most likely to come from outside of public ownership. One example that is in beneficial ownership could be the Dundreggan Estate in Glen Moriston, recently purchased by the charity Trees for Life (TFL) (25). Dundreggan is mostly open, treeless ground, but it has patches of high natural value that TFL want to expand and restore through the rest of the 4,000ha estate. The vision is that Dundreggan will be a landscape of diverse natural forest cover over 60% of the estate. In the wooded areas, there will be mosaics of denser stands intermingled with open and natural clearings. In the north-east, and in flat, boggy ground elsewhere, mires and natural bog communities will be healthy and vibrant. The conifer plantation in the south-west will be replaced with native forest, with scattered open glades and mires. Most human infrastructure including fences will have been removed. They will welcome visitors, particularly those with an interest in ecology, habitat restoration and biodiversity, and there will be a network of low-key interpretation trails for the public.

The recipe will lead to the ecological processes natural to forest ecosystems being re-established, and it is very likely that Dundreggan will meet and probably exceed the three-quarters rule for the objectives of the IUCN category for a national park (see section 6.3.2). Importantly though TFL are sensibly looking wider than their land by liaising closely with neighbouring landowners. It is hoped that nearby landowners will be motivated to restore their own land, especially to their north, which will form a networking bridge between Dundreggan and the larger Caledonian forest area of Glen Affric.

The John Muir Trust, another land charity, are piloting new management standards for wildland on a number of private estates, having learnt lessons from their eight properties in the Highlands and Islands of Scotland that total over 20,000ha (26, 27). Their view is that sustainable management and enhancement of wild land requires an integrated view of the land: from the geology and soils that underpin everything, through the biodiversity that depend on them, the deer and livestock that live on the vegetation, the people that live on the land and those that visit.

Their approach for natural landscapes will be minimal intervention except to kick-start natural processes, as they believe the biodiversity of wild land is closest to a *'natural ecosystem'* which has evolved mainly by the influence of soils and climate. In many cases as a result of overgrazing by deer and sheep and burning, woodlands are the missing components of wild land ecosystems: from montane scrub, through riparian woodland to native woodland, and thus should be restored. In general, killing of native predators should be avoided (e.g. foxes and crows) as these form part of the wider guild of natural predators. Where species have recently gone extinct, re-introductions should

be considered. In the first instance, however, priority should be given to habitat restoration to create the conditions needed for missing species and to encourage their natural spread, for example through habitat corridors.

Within this overall view, there may be the potential to identify core areas of greater natural value, around which cultural landscapes of light use can act as buffering. This again, without necessarily an overt emphasis on recreational access, would seem a candidate for Category II classification.

Alladale Wildererness Reserve is a high profile, privately owned estate restoration of 9,600ha along the Alladale River valley in Easter Ross (28). The restoration is aimed at restoring nature's balance in an area where *"much of the flora and fauna that once thrived here has been driven to extinction by the activities of man"*. Initial extensive tree planting, especially along riparian areas, began the restoration, combined with trialling of the use of the natural behaviour of wild boar in enclosures to churn up ground such that natural regeneration would be aided. A pair of moose were brought in from Scandinavia as the beginning of a programme to restore other native mammal species lost from the landscape.

The Alladale Estate is thus in transition from a traditional sporting estate to a landscape of natural processes. There is a commercial driver for this restoration since the estate is placing itself and the accommodation it provides, as an experience of natural wilderness in the Highlands. With its commitment to restoration, it is likely that the estate will meet the three-quarter rule for a Category II national park, albeit one where the entry price is more than others. It should be noted that the first two national parks established in the Netherlands, Hoge Veluwe and Veluwezoom, were in private ownership (29).

One other category could be of interest in Scotland. The Sámi wilderness areas in Finland are vast, unsettled areas where reindeer husbandry, natural livelihoods of traditional subsistence use and more recently also nature tourism are practised and, as such, they are classified in IUCN Category VI: *"Managed Resource Protected Area"* (see section 3.2.2). They are protected areas managed mainly for the sustainable use of natural ecosystems. In the previous section, the assignment of forests to IUCN categories assumed these protected areas to be semi-natural woodland, where there was sustainable production from native resources with the maintenance of biodiversity. Areas of woodland that meet this characteristic may exist in Scotland, but it is more likely that it will be estates where deer are a considerable natural resource, and where those wild animals are the prime driving force of the landscape other than livestock, soil and climate. They may also be considered for classification under Category VI.

8.5 An ecological network for wildcat in Scotland

It may likely come as a surprise to some that Britain retains a wild feline carnivore. There has been much talk in recent years about returning lynx to the UK, mostly in terms of its release in Scotland, but few outside of Scotland are aware that it already has a junior version of the lynx, as it is home to the last few wildcats that once covered the whole of Britain.

The wildcat is much more common in continental Europe, with Greece, Macedonia, Romania and Bulgaria reporting abundant populations, which may have something to do with the fact that the average woodland cover is three times higher (see Table A3.2 in Annex 3). European wildcats are primarily associated with forest, and are found in highest numbers in broad-leaved or mixed forests with low densities of humans – wildcat are solitary animals, avoiding any contact with humans. They are also found in Mediterranean maquis scrubland, riparian forest, marsh boundaries and along sea coasts. Areas of intensive cultivation are avoided (30).

In Scotland the population number has been downgraded from a few thousand to a few hundred based on evidence that many wildcat could be hybrids with feral domestic cats. A recent study indicates a distribution mostly in the east of the Highlands (31). Wildcat *"hot spots"* occur in the Cairngorms, Tayside and Aberdeenshire as well as outlying areas of Arnamurchan. Records were mostly for lowland areas with many in coastal areas, and this would tie in with the general absence of woodland coverage in the uplands. On the other hand, there are no records in large areas of the north-west Highlands, Wester Ross and parts of north Stirlingshire.

The wildcat is listed on Annex IV of the EU Habitats Directive, so that member states have to give it strict protection in law. (32). Thus in the UK, the wildcat is protected under the Wildlife and Countryside Act 1981, and it was added to the UK Biodiversity Action Plan as a Priority Species in 2007. It was also included as one of 32 species prioritised for conservation action under Scottish Natural Heritage's Species Action Framework in 2007 (33). While the wild cat is classified as a species of Least Concern across Europe on the IUCN Red List, the Scottish population of wild cats is classified as vulnerable (30).

Current approaches to its protection concentrate mostly on reducing the feral cat population in a focussed area to create a haven to reduce dilution of the genetic pool, as well as a captive breeding programme (34). The Forestry Commission issue guidance on how forestry operations can avoid disturbance of wildcat (35) and the sporting estates are being encouraged to identify the difference between wildcats and feral cats so that their predator control is *"wildcat friendly"* (36). As an indication of the threat that predator control poses to wildcat, a radio-collar study in the Angus Glens during the 1990s lost nine out of 31 to being shot or snared (37, 38).

Under obligations for reporting on the status of protected species in the EU Habitats directive, the UK gave the overall assessment for wildcat as Unfavourable – Bad, its long-term viability at risk, with the species likely to become extinct (39). It is important to recognise how this point has been reached. As with any native predator in Britain throughout history, wildcat were feared and disliked by rural communities, such that they were included in the Vermin Act 1566, and a bounty of one penny was placed on their head (40). However, records in churchwarden's accounts show that the amount paid out was invariably more, and frequently as much as a shilling (12 pence). With the rise of sporting estates in the nineteenth century, a *"relentless"* level of killing occurred such that *"throughout the Highlands the slaughter of wildcats by gamekeepers was unremitting"*.

We face here the loss of another autochthonous creature, a symbol of wildness, and a component of functioning natural ecosystems. However, unlike with the loss of bear, wolf and lynx in the UK, there is the chance to pull back from the brink with the wildcat, and in doing so the lesson should be learnt that wildness, wild nature, needs undisturbed space of its own.

Ecological networks were discussed in section 5.5 where it shows the importance of how these networks join up and contribute to national protected area systems, and provide refuge and migratory routes for wild species. An ecological network model for wildcat in Germany shows how important it can be in safeguarding a threatened species.

German and Spanish researchers from the Helmholtz Center for Environmental Research, the Freie Universität Berlin, the Doñana Biological Station of the Spanish Council for Scientific Research, OEKOLOG field research and the Biological Station in Euskirchen have recently developed an ecological model to find suitable habitats for wildcat (41). The model used home range data acquired over four years from radio-transmitters attached to six male and six female wildcats. A total of 13,000 entries were recorded in an investigation area of 150 square kilometres in the southern Eifel region of Germany near Wittlich. Three quarters of this sparsely populated area is covered by forest.

To develop the model, the researchers extrapolated their data to the whole of the Rhineland-Palatinate Federal State, a partially hilly landscape with many forests and which is home to approximately half of the entire German wildcat population. As a test of the model, they checked it against the distributions in two areas in that State: the Bienwald on the border with France and in the northern Eifel region on the border with Belgium. They discovered that a decisive factor for wildcat habitat proved to be the distance to human settlements. They are rare within a one-kilometre range from settlements, and keep away from individual houses in the landscape, or from roads. In this, they are similar to the known behaviour of lynx.

The density of forest and the proximity to forest edges and meadows were also significant factors in wildcat distribution. The researchers observed that at night the wildcats often hunted mice on meadows at the edge of the forest and rested during the day in forest thickets. Areas near water provided good habitat for wildcats, as the water vole, a key prey species for the wildcat, is found there. Their conclusion was that almost half the area of the Rhineland-Palatinate fulfilled the minimum habitat requirements determined, and would theoretically support 1,600 wildcats.

In spite of good habitat conditions in two forest areas in the Rhine Valley and northeast of the Rhine, no wildcats have been sighted there for decades. The researchers concluded that these areas had obviously been cut off from resident populations elsewhere because suitable corridors were lacking through which the animals could migrate into these territories. Because of this, the League for the Environment and Nature Conservation Germany (BUND) funded a nationwide mapping of Germany to show an ecological network for wildcat, with existing core areas and potential core areas based on woodland, and with connecting and potential corridors (see Fig. 8.8). The BUND proposed a "*wildcat rescue network*" based on 20,000 km of corridor over the coming years. A milestone in autumn 2007, was the planting of 20,000 trees and shrubs for a corridor between the Hainich National Park and the Thuringer Wald (Thuringian Forest).



Figure 8.8 Ecological Network for Wild cat in Germany, Helmholtz Centre for Environmental Research (41)

Scotland has mapping for Forest Habitat Networks, and uses it as a basis for targeting woodland grants, and has as well mapping for Lowland Habitat Networks (42). Ancient woodland in Scotland is mapped, with some considerable proportion of it in public control (43) and the Native Woodland Survey of Scotland is underway and will complement the ancient woodland mapping (44). Taken together, these spatial approaches to habitat and habitat networking constitute a part of the datasets needed for ecological networking in Scotland.

The threatened status, but also the ecological importance of the wildcat in Scotland, argues for this ecological networking to have a focus on the wildcat, informed by the study in Germany, and with work to identify the important factors in habitat selection by wildcat. This has the potential to raise the profile of ecological networking in Scotland on the back of an intriguing and compelling wild creature, and it would demonstrate that Scotland is willingly on track to fulfilling its obligations to the wildcat.

8.6 A Scottish summit process for wildland

The year 1968 was a turbulent period in French history, none more so than in the events that took place in Paris that May. The discontent was originally born out of student dissatisfaction at living conditions, but the protests and street fighting escalated, drawing in an ever-widening circle of people disaffected with the Government and President, and who eventually brought many industries to a standstill through withdrawing their labour.

On 25 May, negotiations began between government, trade unions and the employers' federation at the Ministry of Social Affairs, Rue de Grenelle. The result of the negotiations over three days was the "*Grenelle Accords*", an increase in the minimum wage by 35%, a general 10 percent wage increase for industrial workers, a lower retirement age, and a forty-hour workweek. Clearly the unions had won a major deal for the workers.

Nearly 40 years later, President Sarkozy used the significance of that first momentous joining together of state and civil society to launch a great debate on public policy for ecology and sustainable development, dubbing it "*le Grenelle Environnement*" in memory of the Grenelle Accords. The process and outcomes were outlined in section 6.3.3 as an example of an aspirational approach to develop strategy for a national system of protected areas, something that was identified as lacking in the UK (see 8.4.2).

Another example of a process of engagement leading towards a strategic plan for ecology and sustainable development has arisen in Wales after Jane Davidson, the Environment Minister, released a written statement in which she said she wanted to (45):

"work with all our partners to develop a new Natural Environment Framework. In order to carry out this work we will build on existing strong and positive collaborative partnerships by working closely with the public, business and voluntary sector"

The Minister saw this as a means to find new ways to meet the challenging targets for 2010 set by the Convention on Biological Diversity, which Wales like many others had failed to meet. The Welsh Assembly Government was therefore going to take the opportunity over the coming year to fundamentally refresh the approach to Biodiversity and Nature Conservation by reviewing the ways in which the Wales Assembly Government was currently tackling aims and objectives.

The Minister announced in that statement that she would be hosting a major conference on biodiversity in September 2010 which would bring together ideas and best practice, and consider both the positive actions achieved so far, and what needs to be done differently. By the end of 2010, a Natural Environment Framework (NEF) would be published that would outline the new ways in which the challenges would be addressed, especially in the light of climate change.

It has since been explained that the NEF will take an ecosystems approach, and will have a strong focus on sustainable land and marine management in Wales. It will also address climate change pressures on the environment (46). The NEF is being drafted with input from a wide range of stakeholders in Wales, and it is intended that it will be available for consultation with the general public in September 2010. In the meantime, an open session would be held on 30 June in Cardiff where NGOs were welcome to give their views.

Prior to that meeting in Cardiff, a "*narrative*" had been written by the Welsh Assembly Government Natural Environment Framework Programme Team, which was circulated amongst NGOs. The narrative explained that the programme team had begun engaging with key stakeholders and partners to consider what might be Wales response to the challenge (47):

"Wales is, after all, a small country with the culture, collaborative ability and brainpower to tackle these problems in innovative ways. But to do so we are having to be honest about the failures to date and the difficulties ahead, including recognising the reality of prospective financial constraints on government and other action in the coming years"

To square sustainable economic growth, climate change and environmental value from ecosystem services, the narrative declared that:

"We need to be able to harness the public's desire for the services the environment provides with the programmes of action we undertake to conserve our 'natural capital', including the 'keystones' of ecosystems: biodiversity, soils, water etc. To do this we need to bring forward a clear focus on conserving the valued benefits, rather than simply the components, of ecosystems and put a new emphasis on the ecosystem as a whole, rather than its components. This is a question of how we manage and conserve the environment, not whether to do so"

It went on to explain that the traditional focus of biodiversity may not be helpful in an ecosystem services approach, especially when considered in the context of climate change. To secure underlying resilience there would be a need to move the focus from processes and targets that gave species and habitats priority on the basis of their rarity and decline, since it may not serve as a good way to prioritise species essential to ecosystem function.

It is interesting to note that the Ministry for Agriculture, Nature and Food Quality in the Netherlands reached a similar conclusion a few years ago (48). In a recent policy paper, a new approach for conservation was announced that focused on groups of protected species in their habitat rather than on individual species, as was the practice. They had realised that the single species policy did not always prove effective. The new habitat-based approach was about a protection regime that benefits a range of species. It would be targeted at habitats supporting a number of threatened species, which thus makes it much more effective. The new approach aims to protect some 300 endangered plant and animal species, but by protecting habitats rather than single species, many more, less-endangered species are likely to benefit as well

One of the key questions in the narrative paper for the NEF was whether enough was known to be able to identify the priority species and habitats – the "*keystone*" species and habitats - that underlie Welsh ecosystem function, health and resilience. How far did the present large numbers of priority species and habitats in the UKBAP meet this need, if at all, and if not how could it be ensured that the right species were being identified and acted on? The example was given in Wales of western oak woods, complex ecosystems in which individual threatened species, such as pied flycatchers, may or may not be critical to ecosystem health.

It is to be hoped that the evident and motivating conclusion of the authors of the narrative, of a need for a change to a whole ecosystem approach rather than species and habitats, will be thoughtfully discussed during the deliberative process that has been set in train by the Wales Assembly Government. There is the question of pre-emption, that the public will be consulted on a document drawn up by "*experts*", rather than the experts advising the public when they are called upon. This is not a subtle distinction when considering that the UKBAP was solely derived from expert opinion, and as such had little claim to be representative of public will.

As a test of the merit of a deliberative approach in developing a national strategy for wildland in Scotland, a workgroup at a conference on wildland in May at SNH Battleby was asked whether a summit process like the "*le Grenelle Environnement*" would help Scotland develop an identity and aspirations for a national protected area system. (49)

One person familiar with the administrative system in Scotland said that it was unlikely that Government in Scotland would embark on a joining of state with civil society to develop an identity and aspirations for a national protected area system unless it had been a manifesto commitment. Since elections would take place in 2011 next year, it meant there could be a number of months of lobbying on this.

Another suggestion was that Scottish Environmental Link (Scot Link), the forum for Scotland's voluntary environmental organisations (50) could facilitate a one year process with civil society to reach a consensus on ecology and sustainable development, and report the findings to Government. It was remarked however that it may be difficult for individual NGOs to subsume their sectoral interests in achieving that consensus.

In reviewing the studies that have engaged with the public in Scotland on the wildness of their landscapes, it was concluded in section 3.2 that an exemplary study of the perceptions, and reality, of wild land in Scotland remains to be undertaken. That conclusion could be taken further to suggest that whatever motivation there is in Scotland for retaining and perhaps restoring its wildland, that there has yet to be a clear *"territory"* marked out for how that can be achieved.

It may be thought that deliberative processes like the development of the upcoming Sustainable Land Use Strategy for Scotland could have implications for wildland *bolting* into it. Thus Scot Link had stated that the strategy had the potential *"to support landscape and wildlife protection, to ensure more co-ordinated planning and delivery between agencies, to reward multi-benefit land use and to resolve conflicts between different land uses"*(51)

Scot Link gave a list of the aspects of resource protection and ecosystem services that the Sustainable Land Use Strategy should apply to, and which included *"landscape conservation, including the historic environment and wild land"*. No clear territory for wildland is established there, and nor was there when Scot Link connected this *"much treasured and finite resource of wild land"* in Scotland with the threat from renewable energy generation, such that the *"quality of wildness"* is vulnerable to it.

The quality of wildness in this case, as put across by Scot Link, is the absence of built infrastructure, a measure of remoteness from modern artefacts and from mechanised access. As was discussed in section 7.2.4, remoteness doesn't necessarily equate to wildness or being *"untouched"* when the landscape has been modified over thousands of years by cultural use. Advocacy for wildland thus needs to be clear about what it is contending, and where it fits in the wildland continuum. It has to move away from priority species and habitats, move on from viewing development control as being adequate, and look to area protection of functioning ecosystems replete with the keystone species and habitats as highlighted above in the narrative for the NEF.

That *"wild territory"* is a space that, in spite of much talk about it, has little real understanding. A Scottish summit process for wildland, like *le Grenelle Environnement* would be the basis for developing a national strategy for protected areas in Scotland. It should be combined with an exemplary study of the perceptions and reality of wild land in Scotland, and with a rigorous and definitive public opinion survey that is spatially grounded. The latter would go some way in making wildland a clearer territory with all the people of Scotland, and this would enable an understanding of how wildland fits within that national strategy for protected areas. It would seem evident that the Scottish Wild Land Group, a grass roots advocacy for wildland in Scotland, would have a lot to offer in support of this process (52).

8.7 Summary of opportunities

In identifying wildland in Scotland, and any protected area designation that may cover it, by far the greatest overlap with the top 5% WQI is shown by the National Scenic Areas, with almost all the NSAs to the west of the Great Glen having a significant area of high WQI within them. By computation, 50% of the top 5% wildest areas are found within existing NSA boundaries. Notable exceptions of the top wildest areas lying outside the NSAs include Glen Strathfarrar, Glen Orrin and Glen Carron area,

the Fannich, Braemore and Strathvaich Forests to the north, the upper reaches of Glens Kingie, Dessary and Pean in the Lochaber area, and Strath Dionard and Glen Golly in the far north west.

It should be noted that high WQI on its own is not proof of wildland in Scotland since it is only an approximation of where wildland could be found, as it is based on measures of land cover that do not distinguish between Primary and Secondary habitats. In Continental Europe, additional evidence came from concurrence with wildland-dependent species such as the larger carnivores, and the fact that protected areas explicitly safeguarding wildland were almost exclusively found in areas of high WQI. The difficulty in Scotland is that there is no corroborating evidence, and so it has to be about wildland potential along the continuum.

Some indirect corroboration could come from the recent survey of the special qualities of NSAs in which the fieldwork data may refer to a wildland characteristic. At the very least, a qualitative analysis of this fieldwork data may delineate NSAs with a high wildness characteristic, and which may elucidate the apparent differential either side of the Great Glen.

The present regulatory framework for NSAs falls short of having a clear and enforceable regime for protection of wildland. Development of Marine Protection Areas based on judicious use of Marine Conservation Orders under The Marine (Scotland) Act 2010 will provide strong protection of wild seascapes and coastal areas. The Act could be used as a model for similar legislation in mainland areas, perhaps through strengthening of the NSA legislation.

In terms of current non-legislative approaches to protected areas in Scotland, Biosphere Reserves – such as that proposed by the grouping around Galloway and South Ayrshire - provide an exemplar of zoning, a key facet of the approach, and which is lacking in most other UK Biosphere Reserves. In that example, the extent of public ownership in the core and buffer zones, coupled with the low population in the core, would seem advantageous in setting out on a dialogue to marry a core nature zone with the cultural landscapes surrounding it.

The presence of the nationally designated protected area forming part of the core zone of the proposed GSABR provides some measure of a protection regime. However, there is encouragement from the MAB programme for countries to incorporate Biosphere Reserves into their national protected area legislation, thus giving them a coherent framework for all the zones as well as a legislative basis for the protection regime. The MAB programme provides a model law.

There are opportunities for promoting certain designated areas in Scotland as IUCN Category I, II and III, but in the absence of specific legislation. This will be the task of Putting Nature on the Map, the project being undertaken by IUCN-UK. A comprehensive study that classified woodland in the UK under IUCN categories has already been carried out on behalf of WWF and the Forestry Commission. That study had some interesting findings for Scotland, and which were built on here by providing some pointers for likely areas in Scotland, in advance of the IUCN-UK project. The basis of selection of protected areas to be classified will have to be where non-intervention management succeeds in meeting the objectives of SSSI designation, or in areas where ecological restoration is taking place and where there is agreement or safeguard for it to continue.

Wildcat in Scotland is rated as vulnerable on the IUCN Red List, and measures are afoot to begin to remedy this. One aspect that could be considered is ecological networks to improve the ability of wildcat populations to migrate. A study of wildcat habitat and movement in Germany found that in spite of other areas having similar woodland habitat conditions, no wildcats had been sighted there for decades. They concluded that these areas had been cut off from resident populations elsewhere

because suitable corridors were lacking through which the animals could migrate into these territories.

Scotland has the basis for developing this ecological networking through mapping that has already been done for potential Forest Habitat Networks, as well as Lowland Habitat Networks, and the mapping of ancient woodland. A spatial approach to wildcat habitat selection through habitat networking has the potential to raise the profile of ecological networks in Scotland on the back of an intriguing and compelling wild creature.

It has been said that, while the UK has numerous kinds of protected areas, they are not usually thought of as a national system, and there is confusion about the extent and variety of those protected areas in terms of international reporting. That this was the conclusion of an "*expert group*" begs the question of what the greater majority of people think about protected areas, and whether they feel they have a stake in them.

The recent process in France of "*le Grenelle Environnement*" was an inspiring example of the launching of a great debate on public policy for ecology and sustainable development that brought together state and civil society. Full value was given to the outcomes of the debate when the aspiration for three new national parks was incorporated into the action plan of the national biodiversity strategy.

Another example of a process of engagement leading towards a strategic plan for ecology and sustainable development has arisen in Wales in developing of the National Environment Framework. To all intents and purposes, the process of development appears to be standing conventional nature conservation in the UK on its head by stressing a whole ecosystem approach rather than on priority species and habitats.

There is perhaps a lesson here for Scottish wildland in that advocacy for wildland needs to be clear about what it is contending, and where it fits in the wildland continuum. It has to move away from priority species and habitats, move on from viewing development control alone as being an adequate safeguard, and look to area protection of functioning ecosystems replete with the keystone species and habitats as highlighted above in the narrative for the NEF.

This is the "*wild territory*", both figuratively as well as in practical realisation. A Scottish summit process for wildland, like *le Grenelle Environnement*, would be the basis for developing a national strategy for protected areas in Scotland. It should be combined with an exemplary study of the perceptions and reality of wild land in Scotland, and with a rigorous and definitive public opinion survey that is spatially grounded. It would greatly help in making wildland a clearer territory with all the people of Scotland, and how it fits within that national strategy for protected areas.

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COMMON ABBREVIATIONS USED

| | |
|----------|--|
| CBD | Convention on Biological Diversity |
| CDDA | Common Database on Nationally Designated Areas |
| CNP | Cairngorms National Park |
| DEFRA | Department for Environment, Food and Rural Affairs |
| EEA | European Environment Agency |
| EHS | Ecologische Hoofdstructuur (Dutch National Ecological Network) |
| EU | European Union |
| EUROPARC | Federation of Nature and National Parks of Europe |
| FCS | Forestry Commission Scotland |
| GIS | Geographic Information System |
| GSABR | Galloway and South Ayrshire Biosphere Reserve |
| IUCN | International Union for Conservation and Nature |
| JMT | John Muir Trust |
| JNCC | Joint Nature Conservation Committee. |
| LMO | Land Management Order |
| MEA | Millennium Ecosystem Assessment |
| MPA | Marine Protected Area |
| NCO | Nature Conservation Order |
| NEF | Natural Environment Framework |
| NGO | Non-governmental organisation |
| NNR | National Nature Reserve |
| NPPG | National Planning Policy Guidance |
| NSA | National Scenic Area |
| NTS | National Trust for Scotland |
| NUTS | Nomenclature of Statistical Territorial Units |
| RSPB | Royal Society for the Protection of Birds |
| SAC | Special Area of Conservation |
| SNH | Scottish Natural Heritage |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| SWLG | Scottish Wild Land Group |
| TFL | Trees for Life |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| WCPA | World Commission on Protected Areas |
| WDPA | World database on Protected Areas |
| WEI | Wild Europe Initiative |
| WQI | Wildland Quality Index |
| WWF | World Wide Fund for Nature |

Annex 1. GIS modelling - Europe

Mapping wilderness in Europe

Wilderness is just one extreme along a continuum of human modification of the natural environment from the *"paved to the primeval"* (Nash, 1982), and may be seen as a relative condition dictated by the degree of naturalness and lack of human influence and intrusion. It is possible to identify and map the wilderness continuum for Europe using GIS methods that take different perceptions of wilderness and associated definitions into account (Carver, 1996; Carver and Fritz, 1999).

Most definitions of wilderness stress the natural state of the environment, the absence of human habitation and the lack of other human related influences and impacts (e.g., Leopold, 1921; US Wilderness Act, 1964; Hendee et al., 1990). The definition used at the Prague conference is that wild areas *"refer generally to large areas of existing or potential natural habitat, recognizing the desirability of progressing over time through increased stages of naturalness – via restoration of native vegetation and a moving towards natural rather than built infrastructure."*

There are relatively few areas of Europe where true 'wilderness' can be found, at least in the sense of the IUCN Classification of Protected Areas that refers to large areas that are untouched by human activities (IUCN, 1994). Thousands of years of human activity, from early settlement and forest clearance for agriculture to the urbanisation and industrialisation of the 19th and 20th Centuries has created a rich and varied, but highly modified landscape mosaic across much of the continent. However, wilderness conditions can be seen in certain high-latitude and high-altitude areas, such as parts of Scandinavia and the mountains of Central and Southern Europe. In addition, smaller, more fragmented wildland areas can be found over a range of intermediate landscapes across the whole of Europe where the original natural ecological conditions have only been slightly modified by grazing, forestry, recreation or isolated human developments.

GIS can be a valuable tool for wilderness management (Lesslie, 1993; Carroll & Hinrichsen, 1993; Ouren et al, 1994), particularly for mapping, monitoring and analysis. The Australian Heritage Commission (AHC) used GIS to successfully identify wilderness areas for their National Wilderness Inventory on the basis of four attributes: remoteness from settlement, remoteness from access, apparent naturalness and biophysical naturalness (Lesslie, 1994; Miller, 1995). Minimum indicator thresholds were applied to exclude areas that did not meet minimum levels of remoteness and naturalness, thus making an absolute distinction between wilderness and non-wilderness land use.

A more open-ended approach is adopted here, using a less deterministic approach. This is more appropriate for Europe because of the need to be able to identify both large core wilderness areas and the smaller, more fragmented pattern of wildlands across the rest of the continent. On this basis, a more flexible definition of the wilderness continuum based on quantifiable indices and values is required in order to effectively map the environmental characteristics of an area that pertain to wilderness. Thus it is more appropriate to evaluate

several wilderness criteria or attributes by considering their different levels of importance. This is achieved by using a multi-criteria evaluation (MCE) approach to investigate a large number of geographical locations in the light of multiple and often conflicting criteria and wilderness values (Janssen and Rietveld, 1990; Carver, 1991; Eastman et al., 1993). MCE methods allow continuous datasets, describing a range of wilderness attributes and conditions, to be combined in a way that best utilises the full range of the data and allows user weights to be applied as a way of describing the relative importance of each input layer. In doing so, it is possible to generate maps that show the spatial variability and geographical patterns in wilderness quality across Europe.

Wilderness attribute maps are combined using a simple weighted linear summation MCE model as follows:

$$W_{sum} = \sum_{j=1}^n w_j (e_{ij})$$

where:

W_{sum} = position on wilderness continuum

w_j = j^{th} user-specified attribute weight

e_{ij} = standardised score

n = number of attributes

Other, more complex, MCE algorithms exist (Carver, 1991), but the weighted linear summation model has the advantages of simplicity and transparency. By applying different attribute maps and weights, different continuum maps can be produced reflecting different model and policy requirements.

A reconnaissance level wilderness map was produced for the Prague conference in May 2009. Figure A1.1 is an updated version of this map using more up-to-date information supplied by the EEA, and has been developed using established methods of combining wilderness attributes as GIS data layers based on MCE techniques (see Voogd, 1983; Carver, 1991; Fritz et al., 2000; Carver et al., 2002).

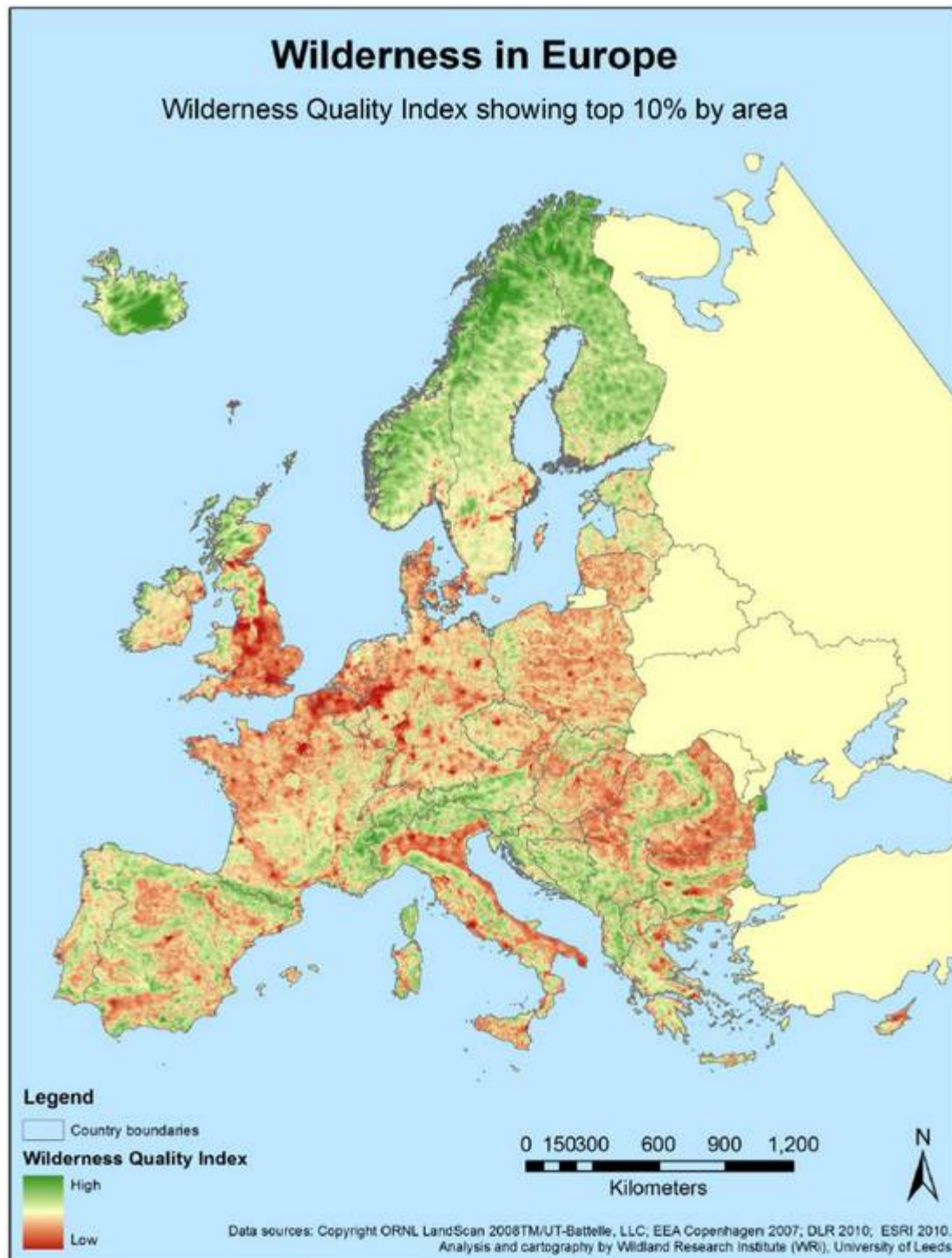


Figure A1.1 Wilderness in Europe

The wilderness attributes used to inform the production of Figure A1.1 include population density, road density, distance from nearest road, rail density, distance from nearest railway line, naturalness of land cover and terrain ruggedness. These were each mapped individually using the best available spatial datasets. Each wilderness attribute used is described below.

Population density

Population density data were derived from the Landsat global dataset (ORNL, 2010). Population density is used here as an indicator of likely population pressure on the landscape. This is shown in Figure A1.2.



Figure A1.2 Population density in Europe

Road density

Road density was derived from the Digital Chart of the World (DCW). This is the United States Defense Mapping Agency's (DMA) Operational Navigation Chart (ONC) 1:1,000,000 scale paper map series (ESRI, 1992) While this dataset is not the most current dataset available it has the advantage of being consistent across all European states. Road density was calculated using a 25km radius kernel density filter and is used here as an indicator of not just road density, but also the likelihood of encountering other human structures such as bridges, dams, power lines, etc. as these are most often found alongside the road network. This is shown in Figure A1.3.

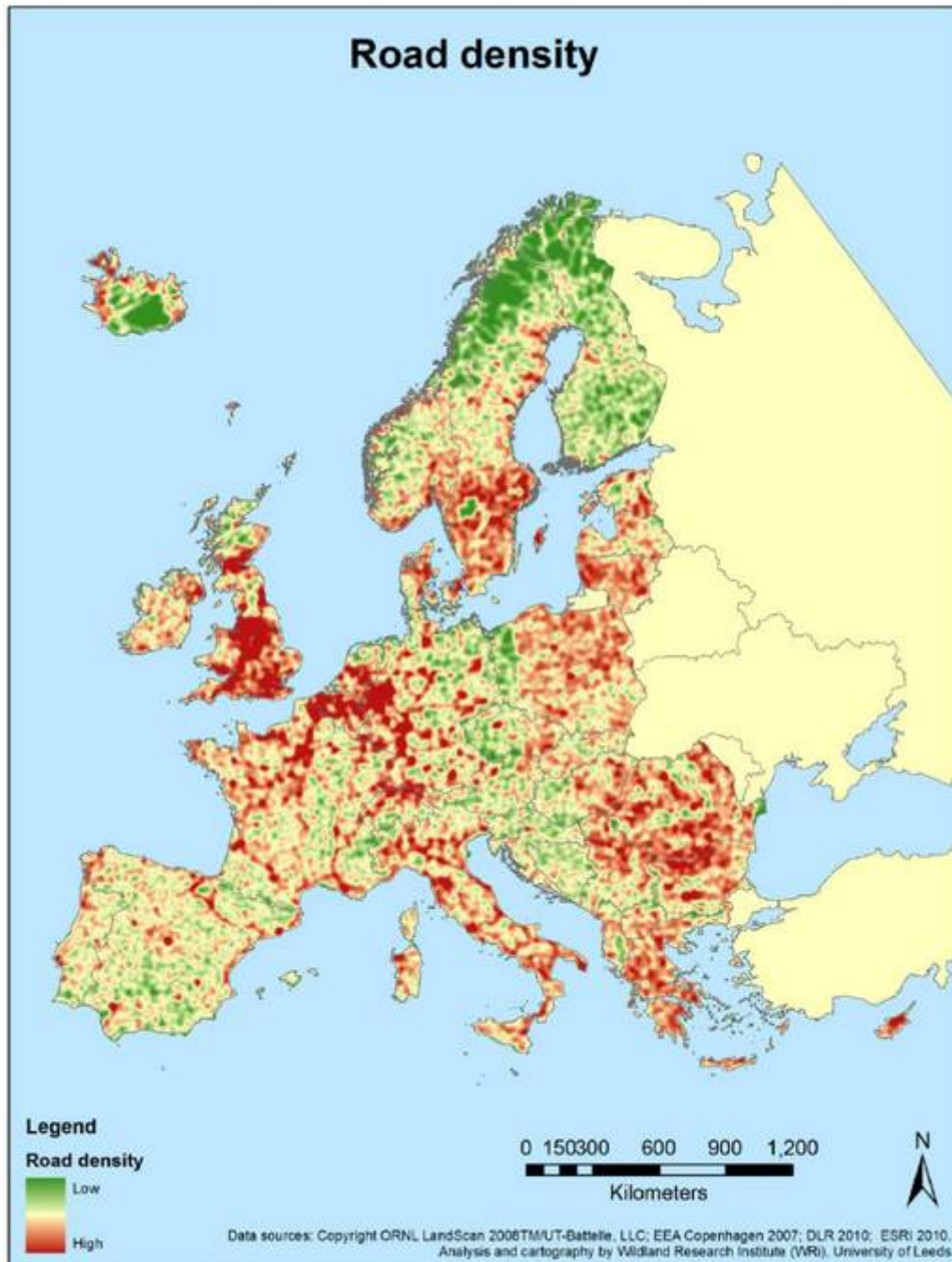


Figure A1.3 Road density in Europe

Rail density

As for roads, rail density was derived from the DCW. Rail density was calculated using a 25km radius kernel density filter and is used here as with road density as an indicator of the density of the transportation infrastructure and associated human artefacts. This is shown in Figure A1.4.



Figure A1.4 Rail density in Europe

Distance from nearest road and railway line

Distance from nearest road and railway line were individually derived from the DCW as separate attributes. Linear distance to the nearest road link and railway line are used as indicators of local remoteness and a proxy for likely visual influence on the landscape from modern human artefacts. This is shown in Figure A1.5.



Figure A1.5 Distance from nearest road or railway line in Europe

Naturalness of land cover

Naturalness of land cover was derived by reclassifying CORINE land cover 2000 data into a series of five naturalness classes based on the classification shown in Table A1.1. The 2000 data set was used because, unlike the 2006 data set, it includes data for all countries in Europe. The naturalness of land cover is used as an indicator of the likely level of human disturbance of natural ecosystem function and vegetation patterns. This is shown in Figure A1.6.



Figure A1.6 Naturalness of land cover in Europe

Terrain ruggedness

Terrain ruggedness was derived from NASA's Shuttle Radar Telemetry Mission (SRTM) digital elevation model data at a resolution of 250m. The Topographic Ruggedness Index (TRI) (Riley et al., 1999; Evans, 2004) was used to describe the amount of elevation difference between adjacent cells of a digital elevation grid. Terrain ruggedness is used here as a likely indicator of difficulty of the terrain and associated inaccessibility as well as an indicator of scenic grandeur. This is shown in Figure A1.7.

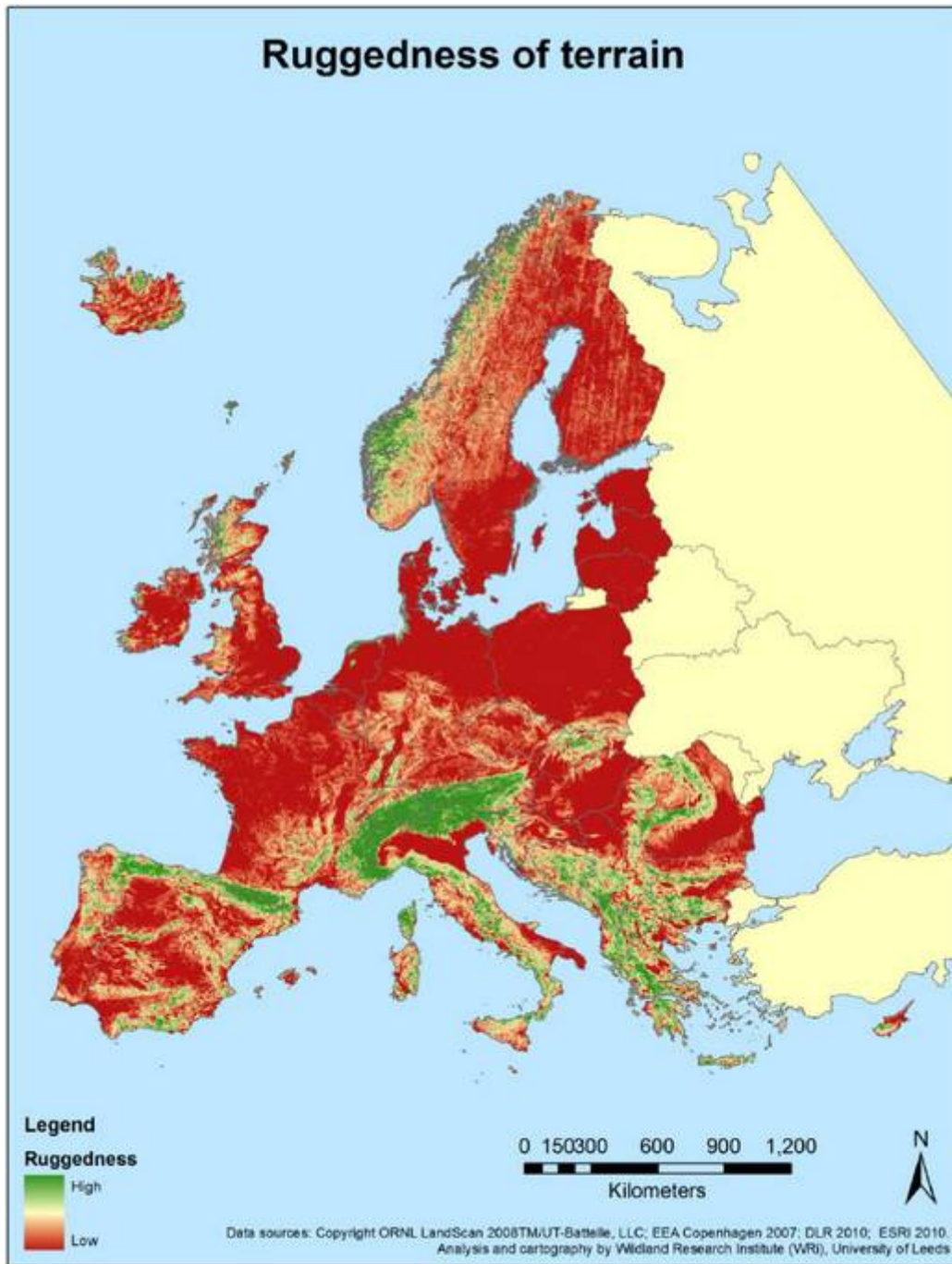


Figure A1.7 Terrain ruggedness in Europe

Results

Numerous permutations of the above wilderness attributes are possible and can be combined using MCE using any number of weighting schemes to reflect particular desired outcomes or policies. The map shown in Figure A1.1 is based on a simple equal weighted combination of population density, road density, distance from nearest road, naturalness of land cover and terrain ruggedness. The top 10% wildest areas are defined on a simple equal area percentile basis and highlighted in blue. These are shown in Figure A1.8.

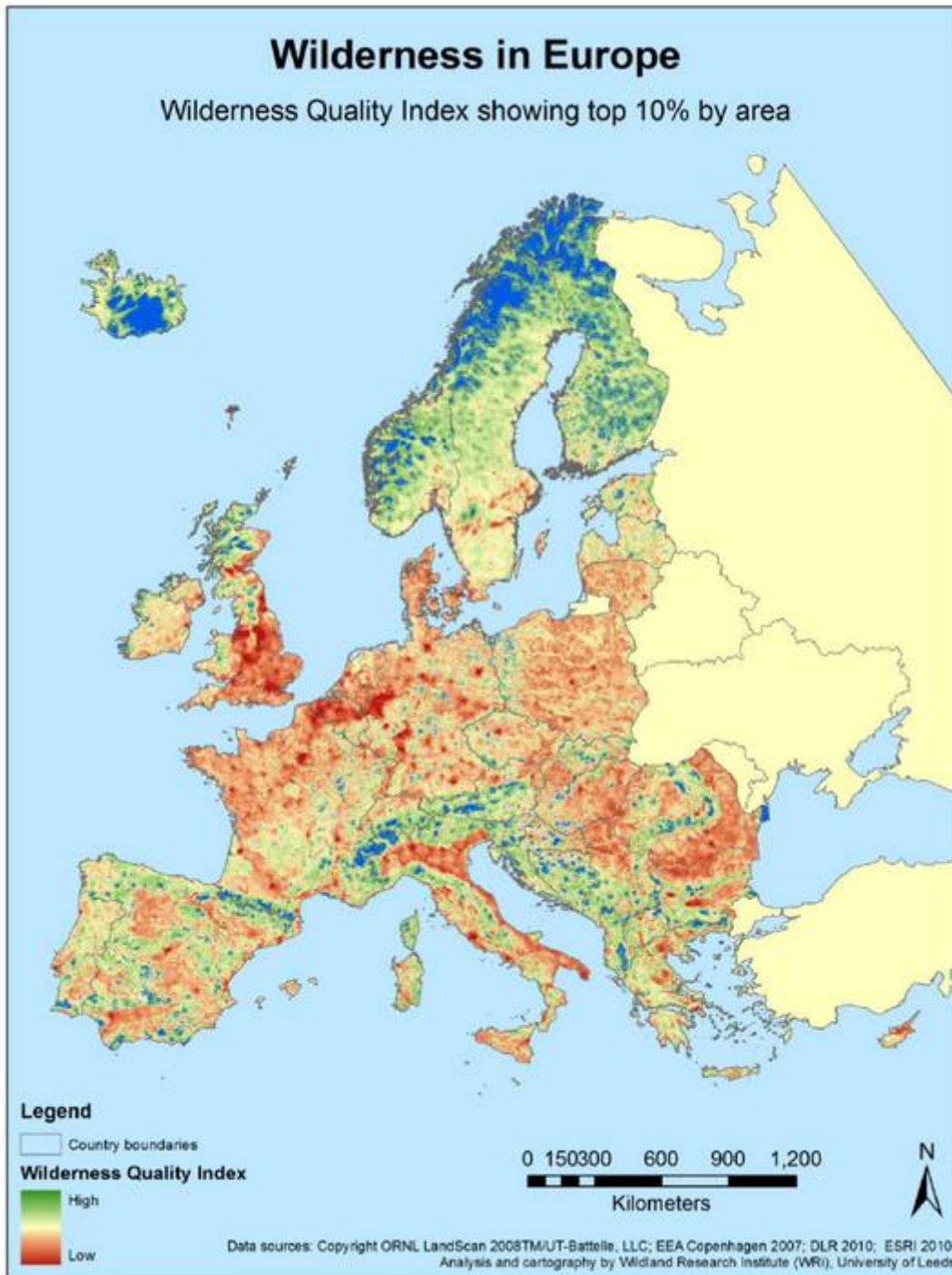


Figure A1.8 Top 10% wildest areas in Europe

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Table A1.1 Reclassification of CORINE land cover classes in to naturalness scores

| CORINE label 2 | CORINE label 3 | Naturalness |
|---|--|-------------|
| Urban fabric | Continuous urban fabric | 1 |
| Urban fabric | Discontinuous urban fabric | 1 |
| Industrial, commercial and transport units | Industrial or commercial units | 1 |
| Industrial, commercial and transport units | Road and rail networks and associated land | 1 |
| Industrial, commercial and transport units | Port areas | 1 |
| Industrial, commercial and transport units | Airports | 1 |
| Mine, dump and construction sites | Mineral extraction sites | 1 |
| Mine, dump and construction sites | Dump sites | 1 |
| Mine, dump and construction sites | Construction sites | 1 |
| Artificial, non-agricultural vegetated areas | Green urban areas | 2 |
| Artificial, non-agricultural vegetated areas | Sport and leisure facilities | 1 |
| Arable land | Non-irrigated arable land | 1 |
| Arable land | Permanently irrigated land | 1 |
| Arable land | Rice fields | 1 |
| Permanent crops | Vineyards | 1 |
| Permanent crops | Fruit trees and berry plantations | 1 |
| Permanent crops | Olive groves | 1 |
| Pastures | Pastures | 2 |
| Heterogeneous agricultural areas | Annual crops associated with permanent crops | 1 |
| Heterogeneous agricultural areas | Complex cultivation patterns | 1 |
| Heterogeneous agricultural areas | Land principally occupied by agriculture, with significant areas of natural vegetation | 2 |
| Heterogeneous agricultural areas | Agro-forestry areas | 3 |
| Forests | Broad-leaved forest | 5 |
| Forests | Coniferous forest | 4 |
| Forests | Mixed forest | 5 |
| Scrub and/or herbaceous vegetation associations | Natural grasslands | 5 |
| Scrub and/or herbaceous vegetation associations | Moors and heathland | 4 |
| Scrub and/or herbaceous vegetation associations | Sclerophyllous vegetation | 5 |
| Scrub and/or herbaceous vegetation associations | Transitional woodland-shrub | 4 |
| Open spaces with little or no vegetation | Beaches, dunes, sands | 5 |
| Open spaces with little or no vegetation | Bare rocks | 5 |
| Open spaces with little or no | Sparsely vegetated areas | 4 |

| | | |
|--|-----------------------------|---|
| vegetation | | |
| Open spaces with little or no vegetation | Burnt areas | 4 |
| Open spaces with little or no vegetation | Glaciers and perpetual snow | 5 |
| Inland wetlands | Inland marshes | 5 |
| Inland wetlands | Peat bogs | 5 |
| Maritime wetlands | Salt marshes | 5 |
| Maritime wetlands | Salines | 2 |
| Maritime wetlands | Intertidal flats | 5 |
| Inland waters | Water courses | 5 |
| Inland waters | Water bodies | 4 |
| Marine waters | Coastal lagoons | 5 |
| Marine waters | Estuaries | 5 |
| Marine waters | Sea and ocean | 5 |

Annex 2. GIS modelling - Scotland

As for the European scale mapping work outlined in Annex 1, a GIS-based approach is developed here to identify the geographical extent and intensity of wildness for Scotland. This is based on previous work on wild land quality mapping utilising GIS-based multi-criteria evaluation (MCE) and fuzzy mapping methods (Carver, 1996; Carver et al., 2002; Fritz et al., 2000; Carver et al., 2008). These methods are used to develop map datasets describing five principal attributes that contribute to perceptions of wildness; namely biophysical naturalness of land cover, accessibility to centres of population, remoteness from mechanised access, road density and ruggedness of the terrain. These data are more specific to the Scottish context and so differ slightly from the ones used in the European level maps. The five attribute maps are combined into a single wildness map using GIS/MCE methods. Although equal weights are applied to the five attribute maps in this report, the use of GIS/MCE methods allow relative priorities derived from public surveys and studies to be reflected in subsequent versions of the wildness map. Different selections of attribute maps and different weighting schemes were testing during the conference on "Scotland's wild landscapes: future ways forward" held at Battleby, near Perth on 13-14th May 2010 and a number of different wildland maps produced (see later). The method is implemented across the whole of Scotland to produce a map that quantifies and spatially delimits wildness across the country that can be used to identify the wildest parts of the Scottish landscapes.

Mapping wildness in Scotland

The attributes of wildness as defined by SNH (2002) and JMT (2004) are adapted and mapped using a combination of readily available national datasets and appropriate GIS-based techniques. All data are collated and mapped at a nominal resolution of 1 km². While too coarse for local level case studies, this resolution is perfectly adequate for a national level reconnaissance study. Five individual attribute maps are produced for the Scotland. These are described in turn, together with the data used, method of mapping and associated caveats/assumptions used.

Biophysical naturalness

Biophysical naturalness is derived from a reclassification of the CEH Land Classification 2000 1 km² dataset from the Countryside Information System (CIS). This is used here as a proxy for the degree of human modification of natural ecosystems by agriculture, grazing, urbanization, industry and transport infrastructure. It is possible to derive a simple sliding scale of naturalness of land cover from the Land Classification data based on the class descriptions given in the accompanying documentation. The Land Classification class descriptions and the derived naturalness classes are shown in Table A2.1. These classes are informed by earlier work on mapping wildness in the Cairngorm National Park (Carver et al., 2008). Although the CEH Land Classification is presented at a relatively coarse resolution of 1 km² the data is itself derived from the higher resolution CEH Land Cover Map 2000 data which is based on 25 m² classified Landsat TM imagery. These data are totalled for each 1 km grid square to give an overall probability of finding

a particular land cover type within each square. These data are utilized here to calculate the overall naturalness for each 1 km grid square in the country. The resulting map of biophysical naturalness of land cover is shown in Figure A2.1.

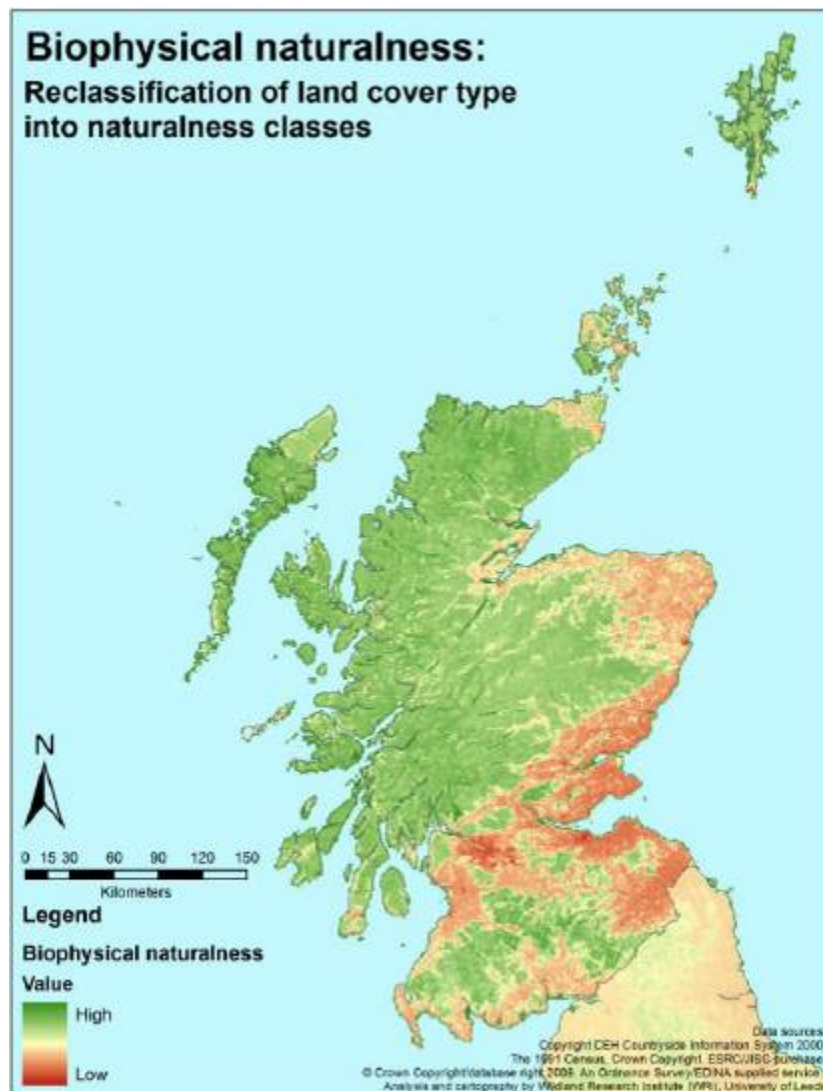


Figure A2.1 Biophysical naturalness

Population accessibility

Population accessibility is used here to describe remoteness from human settlement. The 1991 UK Census of Population is available as 1 km² gridded totals, and is used to derive a population-weighted “as the crow flies” distance surface using a 25 km radius filter. This is shown in Figure A2.2. Although the 1991 Census is nearly 20 years out of date, these data are sufficient for the current project in that it is the relative spatial distribution of population that is being mapped rather than absolute totals. The map in Figure A2.2 essentially shows the relative size of the population living within a days walk from anywhere in the country and therefore is a useful indicator of remoteness from settlement.

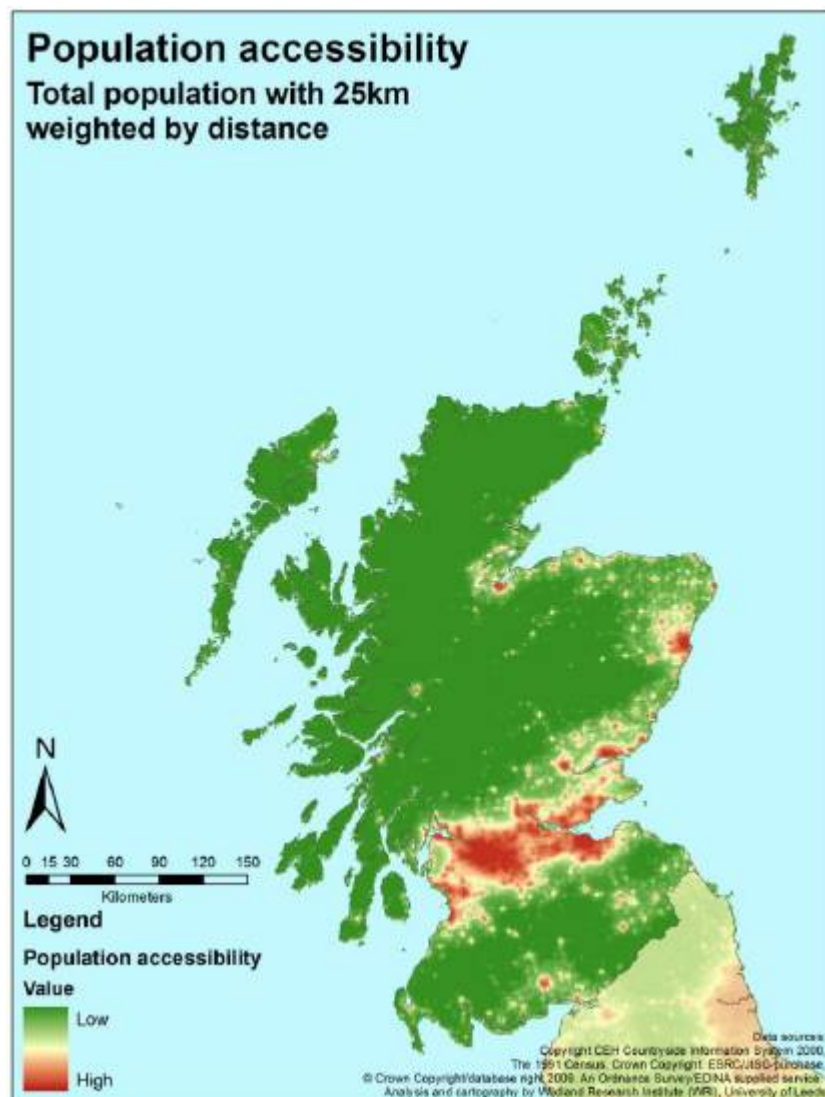
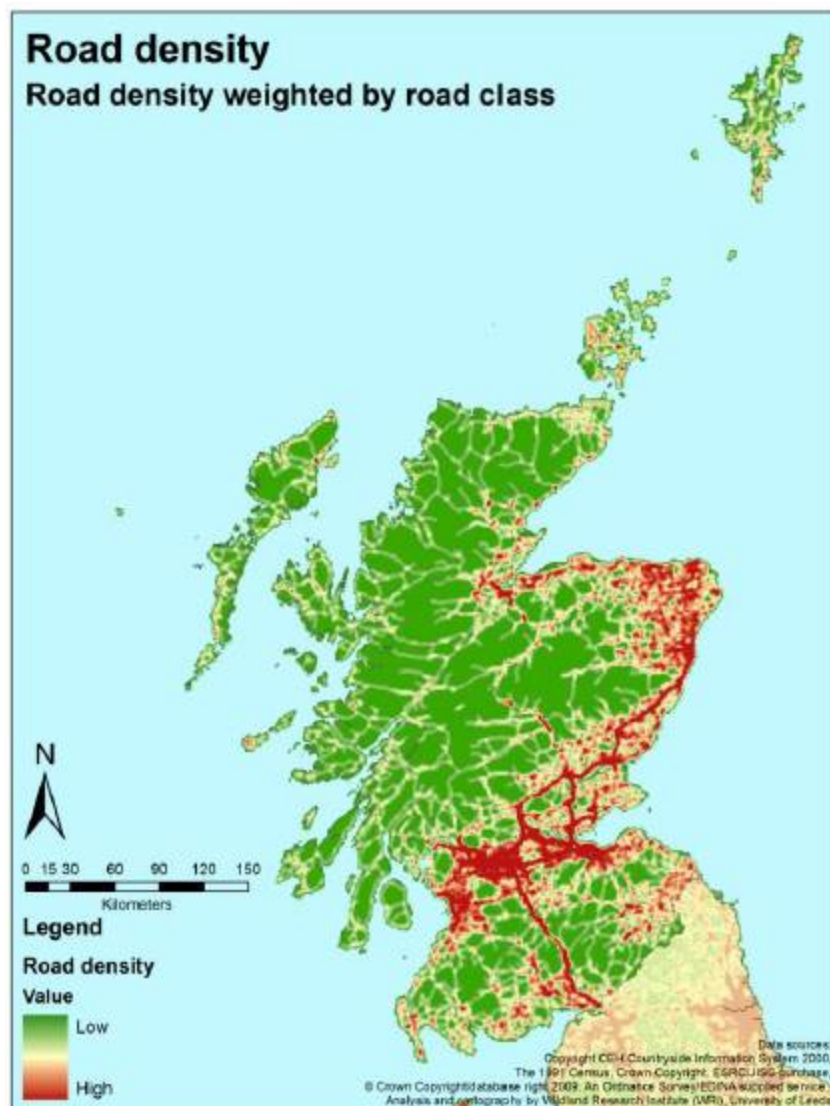


Figure A2.2 Population accessibility

Road density

Road density is used here as both an indicator of local accessibility by mechanised means and of the impact on the landscape from modern human artefacts. Information from the CEH CIS2000 was used to produce an attribute map showing the density of roads within each 1 km grid cell. This is shown in Figure A2.3. Here it is assumed that the greater the density of roads the greater the local access. It is also assumed that most modern human artefacts are linked to the road network and the greater the density of roads then the greater the number of artefacts that can be seen in the landscape. While this does not take variations in the visibility of human artefacts as determined by topography and vegetative screening into account such as can be modelled at the local scale (see Carver et al., 2008) it is a reasonable generalisation at the national scale.



Remoteness

Remoteness is derived here at a national level using distance from nearest road weighted by road type. Larger roads carrying a higher volume of traffic therefore have a much greater impact than smaller roads. This is shown in Figure A2.4. Here the least remote areas are determined by the main motorway and A road transport corridors. Conversely, the most remote areas at this national scale show up as those core mainland areas that are remote from the main road network and the outlying islands of the Western Isles and Orkney and Shetland. While this might not be an accurate representation of local remoteness (e.g. there are roads on Shetland and Harris/Lewis) the map shown in Figure A2.4 is a good representation of relative remoteness at the national scale. Nevertheless, when looking at a local level it is important to use local data and models to better distinguish local patterns in remoteness as has been demonstrated in work for SNH/Cairngorm National Park (Carver et al., 2008) and for JMT in Shetland and Harris/Lewis (Tricker and Carver, 2009).

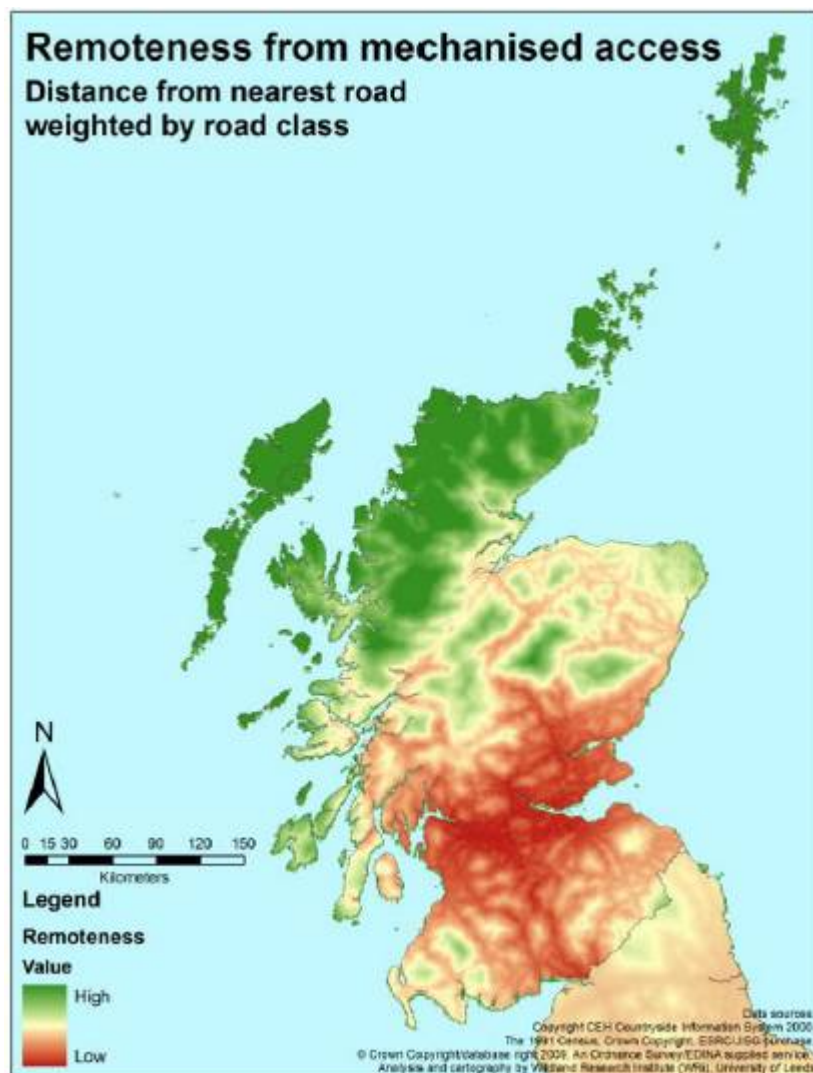


Figure A2.4 Remoteness

Ruggedness

The rugged and challenging nature of the terrain is mapped here using national level terrain data available via the Countryside Information System 2000. Ruggedness is taken here as proxy for wildness and scenic grandeur. While there are various models for determining surface roughness, the map shown in Figure A2.5 is based on the variability in topography using standard deviation of terrain curvature as used in local scale case studies (Carver et al., 2008). This is then aggregated up to a 1 km grid resolution to match the other data layers used in this study.

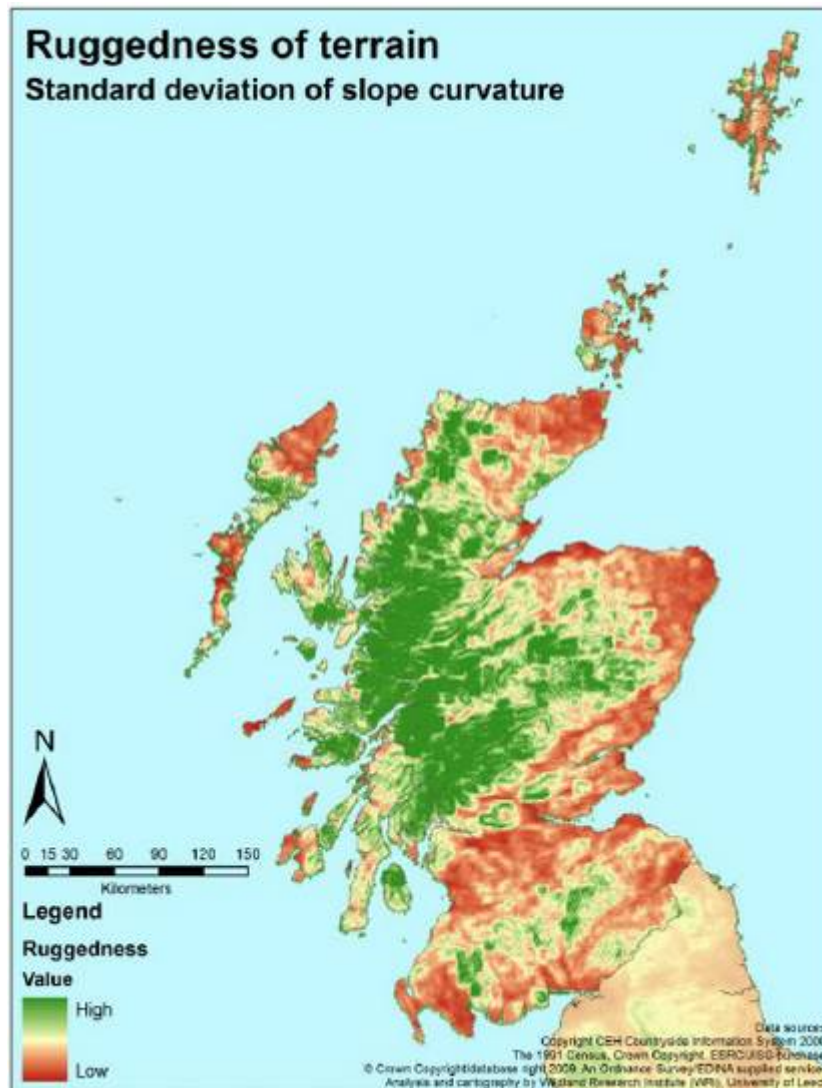


Figure A2.5 Ruggedness

Method

The five attribute layers described above are standardised onto a common scale (0-255) and combined by weighted overlay using GIS to create an overall Wildland Quality Index (WQI) based on the wildness continuum principle (Carver, 1996). Although the results presented in Figure A2.6 are derived using equal weights for all of the five attribute layers, it would be possible to generate alternative maps using differently weighted attribute layers at some point in the future.

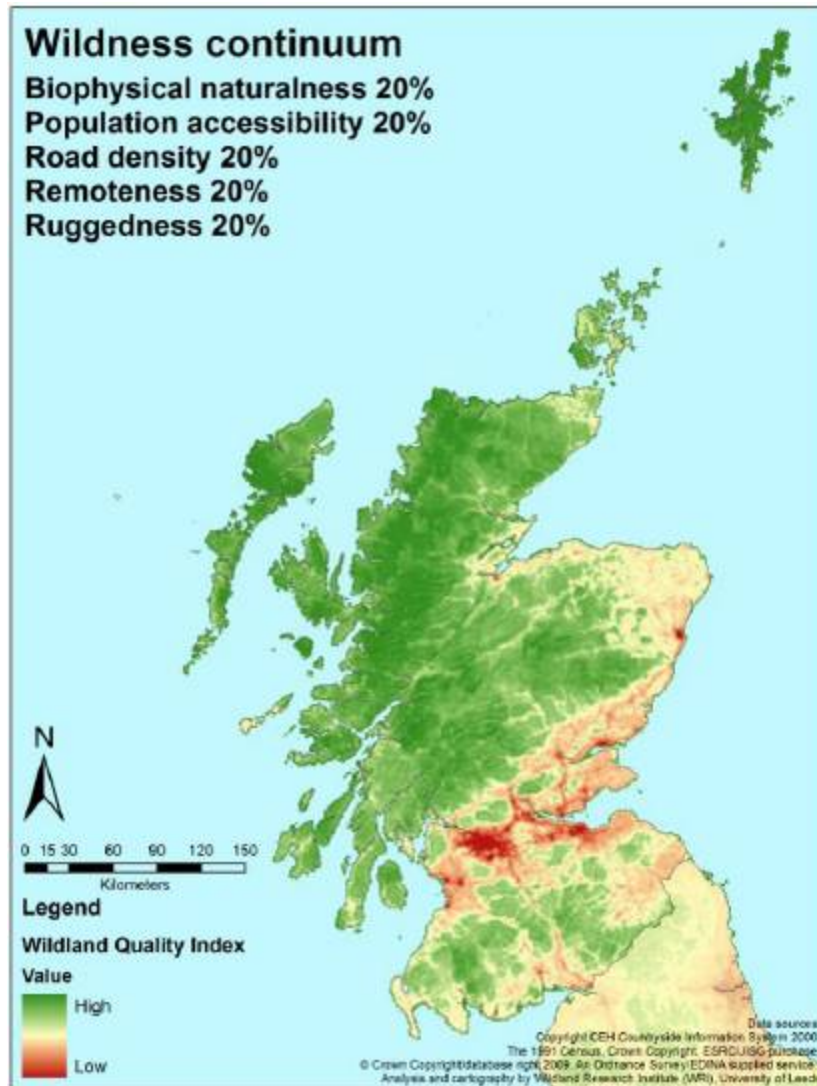


Figure A2.6 Wildland Quality Index

Results

The results from the mapping work are presented as a series of maps showing the percentage wildest areas of Scotland in 5% increments from top 5% to top 25%. Examples are shown in Figure A2.7.

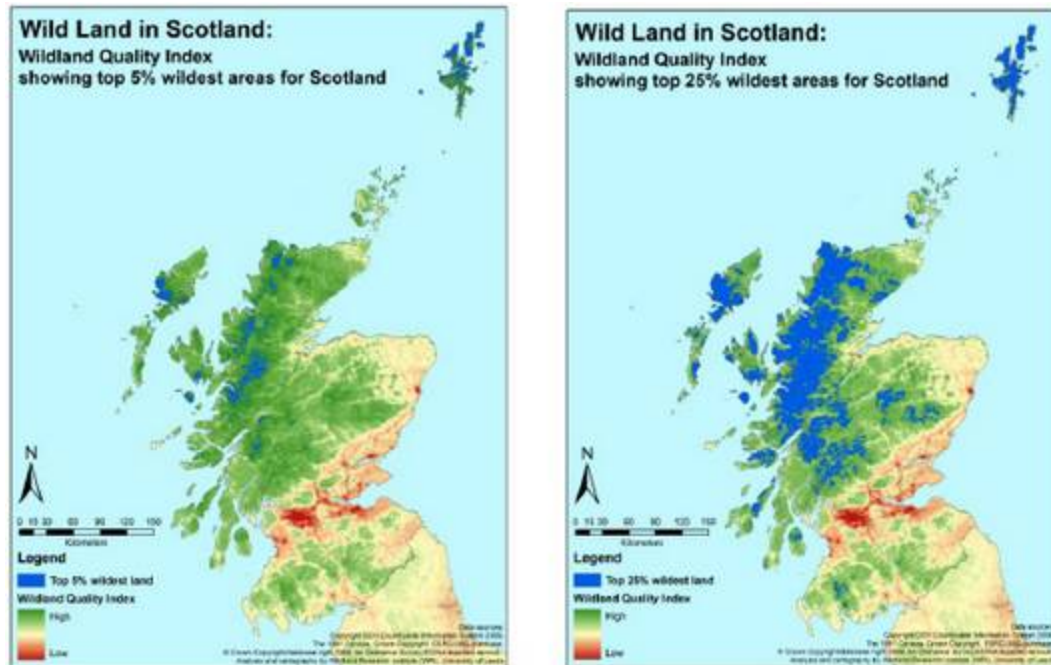


Figure A2.7 Top 5% and 25% wildest areas in Scotland

Six different groups of wildland experts attending the conference on "Scotland's wild landscapes: new ways forward" were asked to make a selection of between three and five attributes from a group of eight (including remoteness, road density, ruggedness, population density, distance from nearest settlement, altitude, naturalness of land cover and absence of modern human artefacts) that best describe wildland and then weight these according to their relative importance. While the six groups all chose different sets of attributes and applied different weighting schemes, the maps produced were all basically similar in terms of the spatial distribute of wildland, rather they were different in the local detail. This is shown in comparing two example maps in Figure A2.8.

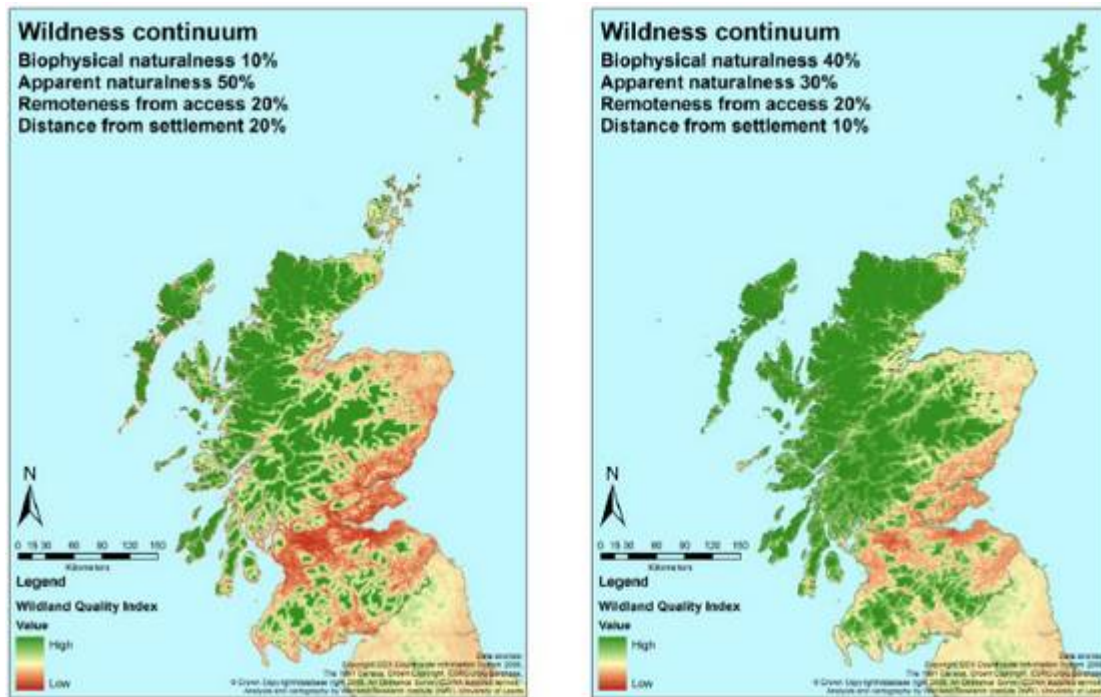


Figure A2.8 Comparison of two wildland maps

A simple difference map showing the range of wildness values from all six maps shows a high degree of agreement between all maps as to where the core wildland areas are located, and as to where the non-wildland areas are. The main differences lie in the boundaries between wild and non-wild. This serves to underline the importance of the need for a rigorous spatial definition of wildland based on wide ranging opinion surveys underpinned by a clear understanding of the wildland concept in relation to Scotland's landscapes. This difference map is shown in Figure A2.9.

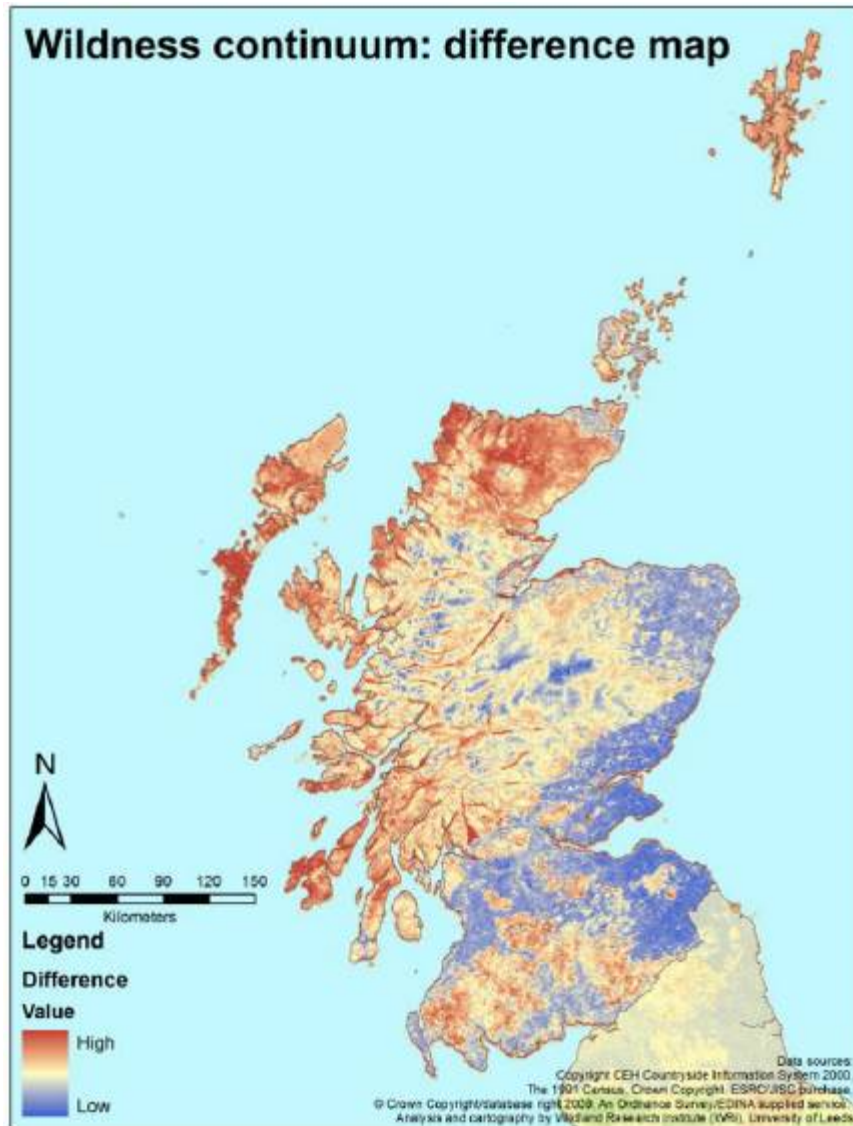


Figure A2.9 Difference map

References

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Table A2.1. Reclassification of CEH Land Classification into naturalness scores

| Land Classification | Naturalness Class/Score | Description |
|---------------------|---|--|
| Bog | Natural to semi-natural (4.5) | Bogs are widespread in upland areas especially to the north and west of Britain. They are also found locally in lowland areas. They are characterised by permanent waterlogging, resulting in depositions of acidic peat. The 'bogs' of this classification are mostly herbaceous communities of wetlands with permanent or temporary standing water (Ordnance Survey maps show the same areas using 'marsh' symbols). Wet heather moorlands, which botanists may refer to as 'bogs', are not generally mapped as such on topographic maps (OS maps show them as 'heaths'), and are mapped by this survey as dwarf shrub categories. Lowland bogs are rare in much of Britain, due to drainage and peat extraction. However, local large areas of bog are to be found on the west coast of Scotland. They carry most of the species of upland bogs, but in an obviously lowland context, with <i>Myrica gale</i> and <i>Eriophorum</i> spp. being highly characteristic. |
| Bracken | Natural to semi-natural (4.5) | The bracken class is herbaceous vegetation dominated by <i>Pteridium aquilinum</i> . It may be upland or lowland, mixed with grass and other species. The obvious characteristic is that the distinctive colour of winter bracken dominates the reflectance of the community |
| Coastal Bare | Natural (5.0) | The coastal bare ground category includes intertidal mud, silt, sand, shingle and rocks. It also includes bare maritime habitats above the tide-line, such as shingle beaches, mobile sand dunes and bare rocks or soil of coastal cliffs. A covering of sparse vegetation, such as pioneer saltmarsh, dune or shingle species will not put the beach into a vegetated class unless the majority of the substratum is covered. |
| Coniferous Woodland | Semi-natural to non-intensively managed (3.5) | Coniferous/evergreen woodland comprises coniferous species (including the deciduous larch (<i>Larix</i> spp.), plus other evergreens such as holly (<i>Ilex aquifolium</i>), Rhododendron (<i>R. ponticum</i>), yew (<i>Taxus baccata</i>) or Holm oaks (<i>Quercus ilex</i>). As well as remaining in leaf all year round, the species generally have very dark leaves or needles, giving them unique signatures in both summer and winter. |
| Deciduous Woodland | Natural to intensively managed (3.0) | Deciduous broadleaved trees including mixed stands cannot be separated spatially; the category includes scrub and orchards. The deciduous characteristic separates it from evergreen species, |

| | | |
|-------------------|---|--|
| | | <p>as it appears bare in winter. However, deciduous woodland has a unique spectral signature which separates it from other deciduous vegetation and from arable land. Mixed woodland may be included with this category, though continuous evergreen stands, where greater than the minimum mappable area, will be separated.</p> <p>Scrub and orchard areas are deciduous, often with substantial herbaceous vegetation. Typical species include willow (<i>Salix</i> spp.) in wetlands, or hawthorn (<i>Crataegus monogyna</i>), brambles (<i>Rubus fruticosus</i> agg.) and saplings or small trees: these include, of course, fruit trees. Although commonplace, the scrub category is rarely extensive enough to record more than just a few pixels. The exceptions are in areas of orchards (though these are only found in a few areas), and in semi-natural vegetation, for example, the willow-carr woodlands of the Broads or hawthorn scrub on chalk downland. For map-production purposes and in most data summaries the scrub and deciduous woodland classes will be amalgamated.</p> |
| Grass Shrub Heath | Semi-natural to non-intensively managed (3.5) | <p>Open shrub heath and open shrub moor are aggregated into one class. Open shrub heath complements the above moorland variety of grass /shrub heath. However, because intensive grazing of lowland heaths is no longer practised, the incidence of this class is rare. It will be found where knowledge-correction has identified an area of the grass / shrub heath mixture as being in a lowland zone. Open shrub moor is fairly commonplace on some marginal hill grazing land, especially in northern and western parts of Britain, where grazing prevents the dominance of dwarf shrub species. It is also extensive in <i>Calluna</i> moorland, as a result of moor-burning to maintain young heather regrowth to promote grouse populations. Initial regrowth produces grassy swards, which over a period of years revert to heather-cover. As the heather senesces, so moorland is re-burnt, with a repeat cycle of perhaps 10 years. Whereas other transient cover-features of management (eg haycutting, arable crop-type) are not defined because of their short-lived nature, the 10-year cycle is judged long enough to justify the distinction between currently managed and unmanaged areas. The proportionate cover of <i>Calluna</i> which is required to alter the classification from 'burnt' back to 'dwarf shrub' is not yet clear: this will become evident on comparison of classmaps with corresponding 1 km field squares of</p> |

| | | |
|--------------|--|--|
| | | Countryside 1990. |
| Grass Heath | Natural to semi-natural (4.5) | <p>Grass heath and moorland grass are aggregated into one class.</p> <p>Grass heath includes coastal dunes and inland grasslands typically growing on sandy soils, usually acid in character. The species might include, on coastal dunes, <i>Ammophila arenaria</i>, <i>Festuca rubra</i> and <i>Carex arenaria</i> and a wide variety of herbaceous species, often winter annuals. Inland, and on mature 'grey' dunes, all but <i>Ammophila</i> might be present, but acid-loving species are typical, including <i>Festuca ovina</i>, <i>Agrostis</i> spp. and <i>Deschampsia flexuosa</i> set in a carpet of lichens and mosses.</p> <p>Moorland grass includes upland swards, mostly of deciduous grasslands, often referred to as grass moorland or upland grassy heath. They are typically dominated by <i>Nardus stricta</i> and/or <i>Molinia caerulea</i>, with <i>Festuca ovina</i>, <i>Deschampsia caespitosa</i>, <i>Juncus</i> spp. often including sparse cover of upland dwarf shrubs. These swards form large tracts of mostly unenclosed hill-grasslands, lightly grazed often by sheep.</p> |
| Inland Bare | Mainly natural with some elements of semi-natural, non-intensively managed and non-natural (4.5) | The inland bare ground category includes all 'natural' surfaces such as rock, sand, gravel or soil, though their origin has often not been natural: the exceptions are coastal features which classify as beach/mudflat/cliffs. Ground which has been bared by human activities, or by livestock would be included. Imported surfaces of sand or gravel (eg car parks) would also be classed as bare ground. |
| Inland Water | Natural (5.0) | Inland water includes all mappable fresh waters and any estuarine waters which are excluded in the sea category. The maps record only those areas which are water-covered on both the winter and summer images. Thus, reservoirs with summer draw-down, or winter-flooded meadows are classified to the summer class (ie bare or grassland in these examples). |

| | | |
|-------------------|--------------------------------------|---|
| Managed Grassland | Managed to intensively managed (1.5) | <p>Managed grasslands comprise many types, from newly sown leys, of single species, to largely unimproved swards of indigenous species. This range is subdivided in many different ways by the many different surveys of grasslands. Here we were constrained by what was possible, with acceptable accuracy, using satellite imaging. The CIS aggregates two original Land Cover Map classes. The first class 'pasture / amenity grass' is identified with good consistency. It characteristically forms a cropped sward, comprising finer grass species often with herbs. The sward is managed by mowing and/or grazing, and maintained as a turf throughout the growing period, such that coarser species of grass, herbs and scrub do not become dominant. The swards are mostly agriculturally 'improved' by reseeding and/or fertiliser use and normally contain high quantities of <i>Lolium perenne</i> and/or other preferred species.</p> <p>The second class, 'meadows, verges and semi-natural swards' includes grasslands which are managed, but mostly at a lesser intensity than the 'mown/grazed turf' class. It also includes semi-natural swards which may have much the same appearance. Partial improvement, where applied, has favoured productive species such as <i>Lolium perenne</i>, and herbicide treatment may have reduced the content of broadleaved 'weeds'; but some of the swards in this category represent the traditional hay meadows which have escaped improvement. The swards may have been mown for hay and perhaps aftermath-grazed. A major element of the managed grass class, <i>Festuca/Agrostis</i> swards, is typical of the indigenous, essentially unimproved, grasslands of neutral to acid soils, mostly enclosed, formerly covering much of Britain's grazing land, but now restricted to upland margins and odd pockets of lowlands, usually on floodplains. Some such seminatural grasslands may be agriculturally non-productive swards which are managed by occasional cutting to prevent excessive weed or scrub growth, eg roadside verges, country parks, golf course semi-rough areas</p> |
|-------------------|--------------------------------------|---|

| | | |
|-------------------|---|---|
| Marsh/Rough Grass | Mainly non-intensively managed to managed with elements of semi-natural and intensively managed (2.5) | <p>This class consists of an amalgamation of three different types of land cover, namely ruderal weed, felled forest and rough grass/marsh. These are described individually below. The ruderal weed cover-type is generally bare ground being colonised by annual and short-lived perennial plants, usually with a considerable remnant of bare ground, especially in winter. The ground may be naturally bare, eg shingle beaches, or abandoned arable land, eg setaside, or derelict industrial works such as demolished factories, gravel pits etc. This category is rarely extensive enough to map, was chosen to classify what might have been extensive areas of setaside, and is aggregated with the rough grass class for maps and most data summaries. Recently felled forest, usually with large quantities of brush-wood etc, comprise this class. As they revegetate, felled areas recolonise with ruderal weeds, and then become rough grassland. Although originally selected in the anticipation that they would be relatively commonplace, felled areas are rare. They will be aggregated with 'marsh / rough grass' class for most display purposes and data-summaries. The rough / marsh grass class includes lowland herbaceous vegetation of fens, marshes, upper saltmarshes, and rough or derelict ground. The characteristic feature of this category is that the swards are not significantly cropped by mowing or grazed by stock. In fact most are unenclosed grasslands, abandoned from economic use. The result is that they have a high standing crop of vegetation, most of which dies back in winter, leaving a dense plant litter.</p> |
| Saltmarsh | Natural (5.0) | <p>Saltmarshes are intertidal sand-, silt- or mud-based habitats, colonised by halophytic grasses such as <i>Puccinellia</i> spp, and herbs such as <i>Limonium</i> spp., <i>Aster tripolium</i> and <i>Triglochin maritima</i>. They remain mostly green in winter. For the purposes of this classmap, only those marshes up to normal high water spring tides (ie those flooded monthly) are included. The upper saltmarsh, inundated only on extreme high-water spring tides, is dominated by coarse grasses such as <i>Agropyron</i> spp.. These are classified accordingly as marsh / rough grass. Areas of seaweeds are sometimes sufficiently extensive to show as vegetated intertidal plant communities. They may comprise the green alga <i>Enteromorpha intestinalis</i> or the brown wracks (<i>Pelvetia canaliculata</i>, <i>Fucus</i> spp. and <i>Ascophyllum nodosum</i>) growing on rocks, boulders and sometimes gravels, sands and muds. Distinction of</p> |

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|-------------|---|---|
| | | <p>this cover type is dependent on the level of the tide on the days of imaging (the lower tide being used to define the lower limit of the seaweed beds or saltmarshes). Thus discrepancies can arise where high tides prevailed on imaging.</p> |
| Sea/Estuary | Natural (5.0) | <p>This category includes all open sea and coastal waters, including estuaries, normally inland to the point where the waterway is constricted to 1 pixel or its continuity is broken by a bridging point. An exception is where waterways open up again into major estuarine features, such as Breydon water near Great Yarmouth or many of the sea lochs on the north-west Scottish coast. The division will be immediately evident by reference to classmaps. It is not intended to accurately show the limit of saline or tidal waters, which may extend much further inland.</p> |
| Shrub Heath | Semi-natural (4.0) | <p>Dense shrub heath and dense shrub moor are aggregated into one class. Dense shrub heath refers to communities with high contents of heather (<i>Calluna</i>), ling (<i>Erica</i> spp.) but perhaps mixed with broom (<i>Cytisus scoparius</i>) and gorse (<i>Ulex</i> spp.). It is mostly evergreen, hence different from other scrub communities. Almost invariably, it represents vegetation on sandy soils, in characteristic sites like the Brecklands, and the Dorset and Surrey Heaths, or on extensive coastal dune systems. The dense shrub moor communities include heather (<i>Calluna vulgaris</i>), ling (<i>Erica</i> spp.) and bilberry (<i>Vaccinium</i> spp.) moorlands. Though dominated by woody shrubs, these may be mixed with herbaceous species, especially those of the moorland grass. The dense shrub moors may be managed by moor-burning, in which case they may be bare, for most of the first year after burning; then the grass / shrub heath mixture is found until dense shrub growth again dominates the cover.</p> |
| Suburban | Non-natural with some elements of intensively managed (0.5) | <p>The suburban/rural development category includes all land where the pixels of the Landsat image have recorded a mixture of built-up land and permanent vegetation. Most suburban and rural developments, where the buildings and associated car-parks etc. remain small enough that they do not fill all of each pixel, are included in this cover-type. Small rural industrial estates, glasshouses, railway stations, larger rural roads, villages, small retail sites are all included in this class.</p> |

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|--------------|---------------------------|---|
| Tilled Land | Intensively managed (1.0) | Tilled land includes all land under annual tillage, especially for cereals, horticulture etc. It also includes leys in their first year, ie if they were bare at the time of the winter imagery. Other land, vegetated at the time of summer imagery but bare soil during the winter, is also included in this land cover type: hence any temporarily bare ground (eg from scrub-clearance, development, mining or soil tipping) would be classified in this category. |
| Unclassified | Unclassified | Within the 25 metre data about 2% of Great Britain remains unclassified, ie. unallocated to any of the 17 'target' cover-types described above. These occurrences represent (i) some small areas within scenes that were either obscured by cloud upon both the summer and winter imagery used for the classification, (ii) some locations for which a single scene of cloud free imagery was not available to the mapping project (eg the island of Tiree), and (c) some areas of unusual cover types that were not defined by the classifier training exercise. In the 25 metre grid cell data these cells are uniquely labelled, with the value '0', in the same manner as those cells designated to one of the 17 target cover-types. In the 1 km summary data the proportion of each 1 km cell that is unclassified is represented by default, by the difference between the sum of the values for the 17 key cover-types and 100. Occasional negative values arise because unclassified is calculated as 100 minus the sum of all cover values. Clearly, rounding up of individual cover values has sometimes produced a sum greater than 100 (ie 100.06 ha) ie an unclassified cover value which is negative |
| Urban | Non-natural (0.0) | The urban development category covers all developments which are large enough to completely fill individual pixels, to the exclusion of significant quantities of permanent vegetation. It includes cities, large town centres, major industrial and commercial sites, major areas of concrete and tarmac, plus permanent bare ground associated with these developments, such as car-parks and tips. |

ANNEX 3 – PROTECTED AREAS IN EUROPE CLASSIFIED UNDER IUCN CATEGORIES – Table A3.1 by number, Table A3.2 by area

| TABLE A3.1 | Notes | IUCN categories | | | | | | Forest cover | SAC No | SPA No | |
|--------------------|-------|-----------------|-----|----|------|------|------|--------------|--------|--------|-----|
| | | Ia | Ib | II | III | IV | V | VI | | | % |
| Albania | | 2 | | 14 | 749 | 26 | 6 | 4 | 36.0 | | |
| Armenia | | 6 | | 2 | | 5 | | | 10.0 | | |
| Austria | | 3 | | 7 | 249 | 623 | 338 | | 42.7 | 168 | 96 |
| Azerbaijan | 1, 3 | 15 | | | | 20 | | | 11.0 | | |
| Belarus | | 2 | | 2 | 315 | 119 | | | 45.0 | | |
| Belgium | 3 | | | 9 | | 343 | | 835 | 22.0 | 280 | 234 |
| Bosnia Herzegovina | 2,3 | | | | 2 | | 1 | | 50.0 | | |
| Bulgaria | | 1 | 54 | 3 | 836 | 46 | 11 | | 33.0 | 228 | 114 |
| Croatia | | 2 | 81 | 8 | 279 | 1 | 89 | 2 | 47.5 | | |
| Cyprus | | 1 | 1 | 14 | 6 | 17 | 3 | 3 | 18.6 | 36 | 7 |
| Czech | 3 | | 10 | 4 | 485 | 1640 | 38 | 1 | 34.0 | 858 | 38 |
| Denmark | | 6 | 7 | 9 | 20 | 204 | 1594 | | 15.0 | 254 | 113 |
| Estonia | 1, 3 | 29 | 857 | | 1202 | 831 | 835 | 732 | 55.8 | 498 | 67 |
| Finland | | 20 | 6 | 34 | 2 | 9 | | 113 | 72.0 | 1,715 | 468 |
| France | 3 | 37 | | 5 | 24 | 1555 | 49 | | 27.8 | 1,334 | 371 |
| Georgia | | 20 | | 4 | | 9 | | | 43.0 | | |
| Germany | | | | 14 | | 8127 | 7208 | | 31.0 | 4,622 | 734 |
| Greece | 3,7 | 5 | | 19 | 70 | 616 | 3 | 50 | 29.1 | 239 | 163 |
| Hungary | | | | 5 | | 139 | 54 | | 19.9 | 467 | 55 |
| Iceland | | 2 | | 3 | 36 | 29 | 24 | 2 | 1.4 | | |
| Ireland | 3 | 75 | | 6 | | 230 | | | 9.4 | 423 | 131 |
| Italy | | 115 | | 22 | 41 | 440 | 153 | | 35.0 | 2,286 | 594 |
| Latvia | | 4 | | 46 | 355 | 202 | 10 | | 44.6 | 331 | 98 |
| Liechtenstein | 3 | | 9 | | | 30 | 1 | | 43.0 | | |
| Lithuania | | 6 | | 5 | | 259 | 32 | 26 | 30.1 | 267 | 77 |

| TABLE A3.1 cont. | Notes | Number of protected areas in IUCN categories | | | | | | | Forest cover | SAC No | SPA No |
|------------------|-------|--|-----|-----|------|------|-----|-----|--------------|--------|--------|
| | | Ia | Ib | II | III | IV | V | VI | % | | |
| Luxembourg | 3 | | 34 | 2 | | 61 | | | 34.0 | 48 | 12 |
| Macedonia | 3,4 | 4 | | 3 | 56 | 11 | | | 36.0 | | |
| Malta | 3 | 3 | 65 | 4 | 45 | 5 | 1 | 1 | 1.1 | 27 | 12 |
| Moldova | | 5 | | | 22 | 16 | 20 | | 9.9 | | |
| Montenegro | | | | 4 | 1 | 5 | 2 | | 45 | | |
| Netherlands | | | | 22 | | 1965 | | | 10.8 | 142 | 77 |
| Norway | 3 | 1866 | 1 | 29 | 91 | 152 | 121 | | 30.7 | | |
| Poland | | 1 | | 15 | | 1382 | 122 | | 28.8 | 364 | 124 |
| Portugal | 3 | 18 | 5 | 1 | 29 | 53 | 37 | 31 | 36.5 | 94 | 50 |
| Romania | | 77 | | 13 | 230 | 661 | 15 | | 28.8 | 273 | 108 |
| Russia | 3,5,6 | 73 | | 36 | 7886 | 2394 | 366 | 52 | 49.8 | | |
| Serbia | | 7 | 1 | 2 | 57 | 18 | 20 | 2 | 26.4 | | |
| Slovakia | | | 607 | 9 | 301 | 162 | 14 | | 40.8 | 382 | 38 |
| Slovenia | 3 | 6 | 50 | 1 | 1154 | 1 | 44 | | 62.8 | 259 | 27 |
| Spain | 3 | 6 | 35 | 62 | 189 | 190 | | | 28.5 | 1,434 | 567 |
| Sweden | 3 | 1792 | 120 | 21 | 316 | 979 | 299 | | 67.8 | 3,981 | 531 |
| Switzerland | 3,5 | 1 | | | 25 | 3005 | 227 | | 29.0 | | |
| Turkey | 3 | 518 | | 342 | 142 | 63 | 30 | 345 | 27.2 | | |
| UK | | | | | | 8475 | 155 | | 11.9 | 623 | 268 |
| Ukraine | 3,6 | 23 | | 8 | 3054 | 2076 | 18 | | 16.5 | | |

Notes

1 countries with unclassified national parks that are wholly (Estonia, 5) or partially (Azerbaijan, 8) filled with other classified areas

2 down-rating: existing PA declassified due to degradation and lack of monitoring.

3 reports showing recent up-rating in i,ii

4 not subclassified into ia or ib - undergoing revision of sites categorization

5 overlapping national designations in category iv inflate the total

6 overlapping national designations in category iii inflate the total

7 National Forest Parks = ii, more recent National Parks are vi and have a variety of zones including ii, iii, iv

TABLE A3.2

Area (ha) in protected areas in IUCN categories

Natura
2000
Area
(km2)

Overlap
%
SAC/SPA

| | Ia | Ib | II | III | IV | V | VI | Total | Natura 2000 Area (km2) | Overlap % SAC/SPA |
|--------------------|---------|---------|-----------|---------|-----------|------------|-----------|------------|---------------------------------|-------------------------|
| Albania | 4,800 | | 17,231 | 8,199 | 68,783 | 72,585 | 18,245 | 189,843 | | |
| Armenia | 102,685 | | 178,002 | | 26,590 | | | 307,277 | | |
| Austria | 1,133 | | 92,216 | 4,956 | 472,007 | 1,992,207 | | 2,562,519 | 11,533 | 17.2 |
| Azerbaijan | 196,464 | | | | 285,696 | | | 482,160 | | |
| Belarus | 81,023 | | 159,097 | * | 762,276 | | | 1,002,396 | | |
| Belgium | | | 306,971 | | 21,641 | | 26,346 | 354,958 | 3,883 | 40.5 |
| Bosnia Herzegovina | | | | 2,003 | 367 | | | 2,370 | | |
| Bulgaria | 1,463 | 75,553 | 193,047 | 80,955 | 15,798 | 265,920 | | 632,736 | 37,656 | 40.3 |
| Croatia | 2,935 | 33,266 | 8,615 | 10,938 | 52,575 | 514,624 | 16,023 | 638,976 | | |
| Cyprus | 3,331 | 23,884 | 16,031 | 494 | 96,765 | 958 | 22,432 | 163,895 | 1,005 | 24.4 |
| Czech | 17,227 | | 83,190 | 160,113 | 61,843 | 1,123,701 | 658 | 1,446,732 | 10,472 | 35.6 |
| Denmark | 1,730 | 14,597 | 12,264 | 8,330 | 62,474 | 95,060 | | 194,455 | 3,857 | 53.7 |
| Estonia | 6,671 | 197,210 | | 264 | 176,661 | 155,944 | 951,582 | 1,488,332 | 8,012 | 31.3 |
| Finland | 160,021 | 127,842 | 884,480 | 771 | 22,123 | | 1,902,735 | 3,097,972 | 48,839 | 0.9 |
| France | 6,123 | | 261,319 | 1,971 | 47,461 | 7,990,130 | | 8,307,004 | 68,681 | 30.3 |
| Georgia | 188,559 | | 71,849 | | 46,179 | | | 306,587 | | |
| Germany | | | 962,326 | | 1,983,752 | 19,019,844 | | 21,965,922 | 45,632 | 23.4 |
| Greece | 3,495 | | 70,767 | 48,344 | 1,093,543 | 138,951 | 824,536 | 2,179,636 | 27,621 | 24.8 |
| Hungary | | | 220,318 | | 24,083 | 594,631 | | 839,032 | 1,967 | 31.5 |
| Iceland | 7,968 | | 1,119,203 | 12,926 | 402,878 | 233,360 | 263,509 | 2,039,844 | | |
| Ireland | 20,929 | | 59,171 | | 74,442 | | | 154,542 | 7,800 | 13.9 |
| Italy | 60,985 | | 1,414,330 | 2,263 | 378,470 | 470,280 | | 2,326,328 | 57,407 | 23.8 |
| Latvia | | 24,439 | 405,689 | 5,299 | 215,359 | 636,139 | | 1,286,925 | 9,085 | 16.2 |
| Liechtenstein | | 1,307 | | | 606 | 1,989 | | 3,902 | | |
| Lithuania | 37,068 | | 156,949 | | 159,055 | 44,879 | 200,134 | 598,085 | 7,116 | 0.0 |
| Luxembourg | | 3,511 | 51,807 | | 6,947 | | | 62,265 | 462 | 16.5 |

TABLE A3.2 cont.

| | Area (ha) in protected areas in IUCN categories | | | | | | | | Natura 2000 Area (km ²) | Overlap % SAC/SPA |
|-------------|---|---------|-----------|-----------|------------|-----------|-----------|------------|--|-------------------------|
| | Ia | Ib | II | III | IV | V | VI | Total | | |
| Macedonia | 12,855 | | 112,988 | 68,389 | 846 | | | 195,078 | | |
| Malta | 104 | 7,637 | 194 | 486 | 306 | 267 | 1,306 | 10,300 | 41 | 18.7 |
| Moldova | 19,378 | | | 1,184 | 3,485 | 23,282 | | 47,329 | | |
| Montenegro | | | 83,900 | 1,600 | 1,060 | 12,131 | | 98,691 | | |
| Netherlands | | | 135,305 | | 729,848 | | | 865,153 | 5,785 | 36.4 |
| Norway | 615,182 | 1,914 | 2,679,294 | 1,821 | 470,333 | 1,202,658 | | 4,971,202 | | |
| Poland | 1,995 | | 203,120 | | 164,232 | 2,546,223 | | 2,915,570 | 55,622 | 25.1 |
| Portugal | 27,065 | 6,206 | 69,592 | 7,264 | 138,110 | 631,527 | 65,442 | 945,206 | 19,262 | 16.7 |
| Romania | 310,232 | | 318,894 | 9,627 | 308,031 | 1,336,385 | | 2,283,169 | 42,647 | 40.3 |
| Russia | 17,240,685 | | 8,582,378 | 2,441,935 | 62,045,612 | 1,115,729 | 8,421,607 | 99,847,946 | | |
| Serbia | 159 | 37 | 58,200 | 7,268 | 152,627 | 221,059 | 15,695 | 455,045 | | |
| Slovakia | | 96,328 | 317,890 | 1,616 | 5,407 | 515,001 | | 936,242 | 14,128 | 27.1 |
| Slovenia | 208 | 6,998 | 83,808 | 15,088 | 63 | 158,542 | | 264,707 | 7,201 | 52.9 |
| Spain | 7,312 | 40,163 | 833,047 | 105,553 | 183,481 | 2,006,533 | 22,579 | 3,198,668 | 140,448 | 21.6 |
| Sweden | 218,396 | 335,399 | 698,083 | 35,275 | 104,391 | 585,194 | | 1,976,738 | 57,133 | 0.8 |
| Switzerland | 17,032 | | | 124,065 | 273,718 | 783,483 | | 1,198,298 | | |
| Turkey | 108,086 | | 840,788 | 5,286 | 1,612,238 | 79,804 | 1,553,314 | 4,199,516 | | |
| UK | | | | | 2,761,774 | 6,011,725 | | 8,773,499 | 17,364 | 41.1 |
| Ukraine | 441,249 | | 49,209 | 80,719 | 937,495 | 287,807 | | 1,796,479 | | |

* no areas given

IUCN data - Nationally designated areas (National - CDDA), European Environment Agency

www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-4

Forest data - Global Forest Resources Assessment 2005, Food and Agriculture Organisation, UN

www.fao.org/forestry/fra/fra2005/en/

Natura 2000 data – Natura 2000 Area Calculation, Environment, European Commission

http://ec.europa.eu/environment/nature/natura2000/db_gis/pdf/area_calc.pdf

ANNEX 4 Protected area legislation across Europe

| | |
|--------------------|---|
| Albania | Protected Areas Act - Nr. 8906, dated 6/6/2002, amended by On some Supplements and Changes in Law NR.8906, dated 6.6.2002 "Protected Areas" Nr.9868, dated 4/2/2008 |
| Armenia | The Law of the Republic of Armenia on Specially Protected Natural Areas, 2006 |
| Austria | Burgenland nature conservation and landscape management law LGBl 27/1991 (amended to 2010) Carinthia's Nature Conservation Act LGBl 79/2002 (amended to 2010) Lower Austria Conservation Act 2000, LGBl 5500 (amended to 2009) Salzburg Nature Conservation Act LGBl 73/1999 (amended to 2009) Styrian Nature Conservation Act LGBl 65/1976 (amended to 2010) Tyrolean Nature Conservation Act LGBl 33/1997 Upper Austrian Nature and Landscape Protection Act LGBl 129/2001 (amended to 2010) Upper Austrian National Park Law LGBl 20/1997 Vorarlberg Law on Nature Conservation and Landscape Development LGBl 22/1997 (amended to 2008) Vienna Conservation Law LGBl 45/1998 |
| Azerbaijan | On protected areas and sites No. 840/IG, 2000 |
| Belarus | About special protected natural territories, N 3335-XII October 1994 On amendments and additions to the law about special protected Natural territories , N 375-w July 2008 |
| Belgium | Act on the conservation of nature (M.B. 11.09.1973) (as amended to 2009)(Wallonia) Decree on natural parks (M.B. 12.12.1985) (amended to 2008)(Wallonia) Decree on nature conservation and the natural environment of 21.01.1997 (amended to 2007)(Flanders) Order of the Government of the Brussels - Capital of April 27, 1995 on safeguarding and protection of nature (amended to 2005) |
| Bosnia Herzegovina | Law on nature protection, 33/2003 |
| Bulgaria | Law for the Protected Territories SG 133, Nov 1998 (amended to 2007) Biological Diversity Act - No. 77/9.08.2002 (amended to 2006) |
| Croatia | Nature Protection Act 70/2005 |
| Cyprus | The Forest Law of 1967 (Consolidated with all amendments until 2003) Protection and Management of Nature and Wild Life Act (Number 153 (I) / 2003) |
| Czech | Nature conservation and Landscape Protection, No. 114/1992 (as amended to 2004) |
| Denmark | Law on Nature Protection - No 933 of 24.09.2009 The law on national parks – No 533 of 06/06/2007 Forest Act – No 453 of 9.06.2004 |

| | |
|---------------|---|
| Estonia | Nature Conservation Act, (RT I 2004, 38, 258) (amended to 2007) |
| Finland | Nature Conservation Act 1096/1996 (amended to 2005) Wilderness Act 62/1991 |
| France | Environmental Code BOOK III : Natural spaces CHAPTER I : National parks (Art. L331-1 to L331-25) CHAPTER II : Nature reserves (Art. L332-1 to L332-27) CHAPTER III : Regional parks (Art. L333-1 to L333-4) Act on national parks, marine parks and regional parks, Act No. 2006-436 of April 14, 2006 Decree of February 2007 enacting the fundamental principles applicable to all national parks |
| Georgia | Law of Georgia on Environmental Protection, December 1996 |
| Germany | Federal Law on Nature Protection and Landscape Protection 2009, S. 2542 |
| Greece | On Forest Law 86/1969 as amended by Law 996/71 On regulating hunting 177/75 as amended by Law 2637/1998 On the protection of the environment Law 1650/1986, as amended by Law 2742/99 and Law 3044/2002 |
| Hungary | Act No. LIII. of 1996 on Nature Conservation in Hungary (amended to May 2009) |
| Iceland | The Nature Conservation Act No. 44, 22 March 1999 |
| Ireland | Wildlife Act, No. 39/1976 Wildlife (Amendment) Act, No. 38, 2000 European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997) |
| Italy | The framework law on protected areas, L. 06/12/1991, n. 394 Regulations implementing Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora 1997, No 357 |
| Latvia | On Specially Protected Nature Territories, 1993 (with amendments to 2007) Law on the Conservation of Species and Biotopes, 2000 (with amendments to 2005) |
| Liechtenstein | Law on the Protection of Nature and Landscape of 23 May 1996 (LGBl. 1996 No. 117) (amended to 2004) Ordinance on Forest Reserves and Special Forest Areas of 21 November 2000 (LGBl. 2000 No 230) (amended to 2007) Law on the protection of the mountain flora of 17 May 1989 (LGBl 1989 No 49) |
| Lithuania | Law on Protected Areas, 9 November 1993 No I-301 (amended to December 2001 – No IX-628) |
| Luxembourg | Protection of nature and natural resources, A-No 10, January 2004 Law on natural parks, A - 67, August 1993 |
| Macedonia | Law on Nature Protection, No. 67/2004 |

| | |
|-------------|---|
| Malta | Environment Protection Act (Act XX of 2001, Chap 435) Development Planning Act (Act I of 1992, Chap 356) (amended to 2001) Flora, Fauna and Natural Habitats Protection Regulations, L.N. 311 of 2006 |
| Moldova | Protected natural areas, No. 1538-XIII from 25.02.98 |
| Montenegro | Law on the Protection of Nature no. 51/08 2008 Law on National Parks 2009 |
| Netherlands | Nature Conservation Act 1998 (amended to 2005) |
| Norway | Nature Diversity Act of 19 June 2009 No. 100 |
| Poland | Act on of 16 April 2004 on Nature Conservation (Official Journal No. 92, Item 880, further amended) |
| Portugal | Act on conservation of nature and biodiversity, Decree-Law No. 142/2008 |
| Romania | Government Emergency Ordinance no. 57/2007 (OJ 442, 29.06.2007) on the regime of natural protected areas, conservation of the natural habitats, wild flora and fauna (with subsequent modifications and additions) |
| Russia | Federal law On Specially Protected Natural Areas 1995 № 33-FZ (amended to 2004) |
| Serbia | Environmental Protection Act (Official Gazette of RS no. 36/2009) |
| Slovakia | The law on nature conservation and landscape, No 543/2002 Coll. of the 25. June 2002 |
| Slovenia | Nature Conservation Act (ZON-UPB2) 2004 |
| Spain | Natural Heritage and Biodiversity Law 42/2007 |
| Sweden | The Swedish Environmental Code, Ds 2000:61 |
| Switzerland | Federal Act on the Protection of Nature and Cultural Heritage (NCHA) SR 451 of 1 July 1966 (Status as of 1 January 2008) Ordinance on Parks of National Importance SR 451.36 of 7 November 2007 (Status as of 1 January 2008) |
| Turkey | National Parks Act No 2873, August 1983 (Official Gazette 18 132) Forest Act No 6831, August 1956 (Official Gazette 9402) |
| Ukraine | On Nature Reserve Fund of Ukraine, 16.06.1992 № 2456-XII (amended to 2010) |
| UK | National Parks and Access to the Countryside Act 1949 Wildlife and Countryside Act 1981 Environment Act 1995 Countryside and Rights of Way Act 2000 National Parks (Scotland) Act 2000 Nature Conservation (Scotland) Act 2004 Planning etc. (Scotland) Act 2006 Nature Conservation and Amenity Lands Order (Northern Ireland) 1985 |