Forests are a national and international priority for conservation. The IUCN system of Protected Area Management Categories is an important tool of conservation, which has recently been recognised by the Convention on Biological Diversity. But there is often confusion about what is meant by protected areas in the context of forest management and conservation. Therefore these guidelines seek to clarify key terms and help planners and managers use the IUCN system consistently.

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Forests and Protected Areas: Guidance on the use of the IUCN protected area management categories

IUCN

World Commission on Protected Areas (WCPA)

Forests and Protected Areas

Guidance on the use of the IUCN protected area management categories

Nigel Dudley and Adrian Phillips
Adrian Phillips, Series Editor

Best Practice Protected Area Guidelines Series No. 12

IUCN
The World Conservation Union

CARDIFF UNIVERSITY

IUCN
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These Guidelines are one of the Best Practice Protected Area Guidelines series.
The Series Editor is Prof. Adrian Phillips.

Other publications in the series are as follows:

National System Planning for Protected Areas. No. 1. Adrian G. Davey, 1998, x + 71pp. Also available in Chinese.

Economic Values of Protected Areas: Guidelines for Protected Area Managers. No. 2. Task Force on Economic Benefits of Protected Areas of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Service Unit of IUCN, 1998, xii + 52pp. Also available in Russian.

Guidelines for Marine Protected Areas. No. 3. Graeme Kelleher, 1999, xxiv + 107pp.

Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies. No. 4. Javier Beltrán, (Ed.), IUCN, Gland, Switzerland and Cambridge, UK and WWF International, Gland, Switzerland, 2000, xi + 133pp. Also available in Spanish.

Financing Protected Areas: Guidelines for Protected Area Managers. No. 5. Financing Protected Areas Task Force of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Unit of IUCN, 2000, viii + 58pp.

Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas. No. 6. Marc Hockings, Sue Stolton and Nigel Dudley, 2000, x + 121pp. Also available in Chinese and Russian.

Transboundary Protected Areas for Peace and Co-operation. No. 7. Trevor Sandwith, Clare Shine, Lawrence Hamilton and David Sheppard, 2001, xi + 111pp. Reprinted in 2003. Also available in Chinese.

Sustainable Tourism in Protected Areas: Guidelines for Planning and Management. No. 8. Paul F. J. Eagles, Stephen F. McCool and Christopher D. Haynes, 2002, xv + 183pp. Also available in Chinese and Spanish.

Management Guidelines for IUCN Category V Protected Areas: Protected Landscapes/Seascapes. No. 9. Adrian Phillips, 2002, xv + 122pp. Also available in Chinese, French and Spanish.

Guidelines for Management Planning of Protected Areas. No.10. Lee Thomas and Julie Middleton, 2003, ix + 79pp. Also available in Chinese.

Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation. No.11. Grazia Borrini-Feyerabend, Ashish Kothari and Gonzalo Oviedo, 2004, xvii + 112pp.

Forests and Protected Areas

Guidance on the use of the IUCN protected area management categories

IUCN – The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 1000 members in all, spread across some 150 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. A central secretariat coordinates the IUCN Programme and serves the Union membership, representing their views on the world stage and providing them with the strategies, services, scientific knowledge and technical support they need to achieve their goals. Through its six Commissions, IUCN draws together over 10,000 expert volunteers in project teams and action groups, focusing in particular on species and biodiversity conservation and the management of habitats and natural resources. The Union has helped many countries to prepare National Conservation Strategies, and demonstrates the application of its knowledge through the field projects it supervises. Operations are increasingly decentralized and are carried forward by an expanding network of regional and country offices, located principally in developing countries.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

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The Department of City and Regional Planning, Cardiff University is pleased to be a partner in the production of this important series of guidelines for protected area planning and management. The Department, through its Environmental Planning Research Unit, is actively involved in protected areas research; runs specialised courses on planning and environmental policy; and has a large Graduate School offering opportunities for persons interested in pursuing research for a PhD or as part of wider career development. If you are interested in learning more about the Department, its research capabilities and courses please write to us at the address given below.

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Preface

Protected areas are the cornerstone of virtually all national and international conservation policies. They play a critical role in conservation of biodiversity, maintaining genetic resources, protecting important ecosystem functions and helping to protect many fragile human communities and cultural landscapes. Around 11.5 per cent of the earth's land surface is in protected areas, 10 per cent of the world's forests are to be found in protected areas, and Forest Protected Areas make a critical contribution to conservation.

Despite their importance, there is much confusion about Forest Protected Areas. These questions have come to prominence because the UNECE/FAO Temperate and Boreal Forest Resource Assessment, and the various regional criteria and indicator processes for sustainable forest management, require governments to be very specific about the number and extent of Forest Protected Areas in their countries.

So to help reduce the confusion, the first key question addressed by these Guidelines is this: **What is, and what is not, a Forest Protected Area?** This question may appear arcane: in fact it is strategic, complex and politically significant.

It is strategic because it touches on the heartland of conservation strategies: the nature of protection and protected areas and the relationship between these and the rest of the landscape.

It is complex because changes in the way forests are used and cared for mean that the distinctions between "protection" and "management" sometimes become confused. Interpreting the definition is not therefore straightforward. Moreover, it requires an understanding of the way that forest protection relates to the IUCN definition of a "protected area": different countries adopt different interpretations of this relationship at present.

And it is politically significant because the higher profile given to protected areas, and particularly the desire of governments and others to be seen to be achieving conservation objectives, mean that the definitions and uses of protected areas are being continually challenged, stretched and sometimes distorted. Such pressures bring their own dangers. On the one hand, there is the risk that "protected area" becomes a term used so widely that it ceases to have any real value. On the other hand, in reaction it may be interpreted so narrowly as to exclude many stakeholders and be fatally weakened politically.

Important as Forest Protected Areas are, concentrating on them to the exclusion of other measures for forest protection and good management would be short sighted – indeed an understanding of what is a Forest Protected Area requires also a good appreciation of other ways in which forests are cared for or used. Therefore these Guidelines also aim to answer a second key question: **what other forms of forest protection are there, and how do they relate to Forest Protected Areas?**

In answering these questions, the Guidelines supplement and are consistent with IUCN's general guidance about protected area categories (IUCN, 1994). They have been produced in part

as a response to a recommendation of the Vth World Parks Congress in Durban in 2003: that WCPA should promote "…the use of the categories for protected areas in forests, marine and freshwater environments" (IUCN, 2003). However this is a complex issue and often a controversial one. Therefore the guidelines should be seen as work in progress and there is currently a task force of the World Commission on Protected Areas looking into the whole issue of the categories. IUCN encourages their application in different regions and situations as a way of helping to update and improve guidance and would welcome feedback and comments.

Part I

The Guidelines

1. Basic concepts, background and introduction to the Guidelines

Basic concepts

These Guidelines centre around five related concepts: 1) protected areas, 2) forests, 3) forests as defined for the purposes of Forest Protected Areas, 4) Forest Protected Areas, and 5) other conserved forests. The definitions used in relation to these terms are given in Box 1.

Box 1. Definitions of basic concepts

1. Protected Area
An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means (IUCN, 1994) – *for further development see Boxes 2 and 5.*

2. Forest
Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity *in situ*. A forest may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground, or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 per cent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest. (FAO, 1998) – *for further development see Box 3 and Chapter 2.*

3. Forests for the purposes of Forest Protected Areas
Forest occurring within a protected area but excluding those that are managed for a primary objective other than biodiversity conservation and associated cultural values – *for further development see Box 4.*

4. Forest Protected Area
A subset of all protected areas (as defined in 1 above), that includes a substantial amount of forest (as defined in 2 and 3 above). This may be the whole or a part of a protected area – *see further explanation in Chapter 3.*

5. Other conserved forests
Forests which occur outside protected areas (1 above) – and therefore do not qualify as Forest Protected Areas (4 above) – but which nonetheless are managed in ways that have important benefits for biodiversity. They perform some of the same functions as Forest Protected Areas and share some of their characteristics, but the biodiversity benefits are incidental to the main purpose of forest management – *see further explanation in Chapter 4*.

The value of forests

From the boreal zone to the wet tropics, the world's forests are a storehouse of much of the world's biodiversity. They are outstanding examples of natural systems at work, with their important role in bio-geo-chemical cycles. Forests help to sustain the world's life support systems, and provide vital services, such as water supply and soil protection, for local and more distant communities. Many forests are of great economic importance. They are homes to many cultures, and especially those of indigenous peoples. They are important to communities for their spiritual and recreational values. Forests everywhere are a source of wonder and delight.

Forest protection, management and restoration

Because forests fulfil an enormous range of functions they require many different management regimes. Some forests require total protection, but all require good management; and many destroyed or damaged forests need to be restored. A range of land-use approaches is required to deal with forest protection, management and restoration. These approaches include a variety of protected area types. The IUCN definition of a protected area (see Box 1) forms the basis for the six management categories, ranging from strict protection to multiple use, which are summarised in Box 2 below and described in more detail in Box 5.

Box 2. The six IUCN Protected Area Management Categories

The following six management categories fit within the IUCN definition of a protected area (see Box 1):

Ia: area managed mainly for science or wilderness protection
Ib: area managed mainly for wilderness protection
II: area managed mainly for ecosystem protection and recreation
III: area managed mainly for conservation of specific natural features
IV: area managed mainly for conservation through management intervention
V: area managed mainly for landscape/seascape conservation or recreation
VI: area managed mainly for the sustainable use of natural resources

Protected areas, such as national parks and nature reserves, are essential for biodiversity conservation. But they are only one instrument among several for the responsible management of the forest resource. They need to be supplemented and complemented with other types of forest management, including other kinds of protection that fall outside the IUCN definition of a protected area, for example safeguarding environmental services such as watershed protection, or creating temporary protection through time-limited conservation payments. A very wide variety of terms and approaches are used to define forests with different conservation functions; research in Europe and the Russian Federation found over 500 different terms used to define protective functions and classifications in forests (MCPFE, 2003). Many of these would not fall within the IUCN definition of "protected area", but nonetheless have a very important role to play in the protection of the forest landscape.

Challenges and opportunities

Protected areas as defined by IUCN now cover about 11.5 per cent of the land surface of the earth (Chape *et al*., 2003) and the total area under protection has continued to increase rapidly over the past decade. The classification and management of these places therefore assume ever greater importance. At the same time, there is growing interest in forests and forest conservation, both in the tropics and the temperate world. It is important that governments report accurately on their efforts at forest conservation, especially as non-governmental organisations and civil society are quick to criticise anything that is perceived to be a false claim. An example would be to claim a forest as a "protected area" when it is not in fact managed in accordance with the IUCN definition. Therefore there needs to be agreement on exactly what is the relationship between the different management regimes for forests – from intensive production to complete protection – and protected areas.

This apparently simple question has a number of implications, from technical issues relating to data collection and forest statistics to questions about planning and managing landscapes for multiple purposes, including conservation. In developing these Guidelines, the following key issues have had to be addressed:

- ***Data collection.*** Following decisions at the Earth Summit in 1992, and the publication of *Agenda 21* and the associated *Forest Principles*, countries have broadened the range of issues that they include in national, regional and global forest assessments. A series of international initiatives have carried these ideas forward, culminating in the UN Forum on Forests, with a work programme that was endorsed by the World Summit on Sustainable Development in 2002. A number of regional measures for sustainable forest management have also been developed, such as the Montreal Process and the Ministerial Conference on the Protection of Forests in Europe, which help to assess each country's national forest estate against a standard set of social, environmental and economic indicators. In developing the indicators, it has become clear that perceptions of forest quality are extremely variable. Thus, as well as statistics about the area under trees and rate of annual increment, there is a need to include a range of environmental and social issues. For example, ministries of environment and forestry are increasingly being asked to supply information about the number and extent of Forest Protected Areas. This can be doubly challenging when many of those involved have little specialised knowledge of the concepts that underlie the creation and management of protected areas.

- ***Confusion about terminology.*** Problems with data collection are complicated by a lack of agreed terminology about different forest management regimes. Box 1 sets out the way in which key terms are used in these guidelines and which might usefully be applied more widely. Though the application of these terms – and especially Forest Protected Areas – in data collection may seem simple, the need to measure the extent of Forest Protected Areas has led to a lively debate. Some have argued that any forest that is conserved against land-use change, or which performs a protective function such as avalanche control, should be regarded as protected area. Others believe that this would lead to the inclusion of many areas that do not meet the definition and criteria as developed by IUCN and would confuse and weaken the concept of protected area networks. Almost any forest performs "a protective function" in some way, for example by holding and purifying water, reducing soil erosion, preventing avalanches and delaying snowpack melt,

combating the destructive effects of winds, moderating the impact of solar insolation, counteracting the effects of various kinds of pollution, including noise, and absorbing carbon dioxide. When "protection" can mean so many different things, an agreed terminology is needed as a basis for reliable data, effective communication and consistent policy initiatives.

- ***Development of the system of protected area management categories.*** In parallel with the progress made towards a better understanding of overall forest protection and sustainable management, IUCN, through its World Commission on Protected Areas (WCPA), has been developing a clearer understanding of the concept and role of protected areas. It published the *Guidelines on Protected Area Management Categories*, which defines a "protected area" and introduces six management categories in a global system of protected areas classification – see Boxes 2 and 5 (IUCN, 1994). Data collected under this system are held by the UNEP World Conservation Monitoring Centre (UNEP-WCMC), in the World Database on Protected Areas (WDPA). Information on this is available on the UNEP-WCMC website (www.unep-wcmc.org/), and is published by UNEP-WCMC and IUCN as the *UN List of Protected Areas* (the latest by Chape *et al.,* 2003). Since the current definition and categories have been in existence for more than a decade, IUCN and UNEP-WCMC collaborated with the University of Cardiff in Wales in investigating how the categories have been used and what problems had come to light. The report of this research, published under the title *Speaking a Common Language*, was issued in time for the Third World Conservation Congress, Bangkok, 2004 (Bishop *et al.,* 2004). Some of the conclusions of this research project relate directly to the use of protected area data in wider forestry statistics and are reflected in this document.

- ***Broad-scale conservation.*** At the same time as it has developed a framework for data collection and communication on protected areas, IUCN has, with some of its members, been promoting the idea of ecosystem or landscape scale management. In this approach, protected areas are key components in large-scale planning for natural resource management and protection, and for sustainable development (Pirot *et al.,* 2000). When working at a landscape or an ecosystem scale, the relationship of protected areas as defined by IUCN to other forms of management is critical. Forest Protected Areas and the proper management, and where necessary restoration, of other forests, are all essential elements of the ecosystem approach.

Aims of the Guidelines

There is an urgent need for clear policy directions in the management of the world's forest estate, based on accurate data on forest protection. These data should in turn be based on a commonly understood framework for classifying forests. This framework should relate both to forests that are in protected areas and to those that are subject to other forms of management. It has become clear to both forestry and protected area communities that there is a need for additional guidance on how to interpret the 1994 guidelines in respect of forests. The purpose of these guidelines is to help meet these needs by:

- clarifying the relationship between IUCN categories of protected areas (as set out in 1994) and other forest management regimes;

- demonstrating how Forest Protected Areas in each of the six categories can be planned and managed as key components of national-level sustainable forest management strategies; and
- illustrating how other forest management regimes can contribute to the overall protection of the forest estate.

Relationship to other IUCN guidance

This publication does not stand alone, but derives in particular from the need to provide supplementary advice on the application of the IUCN protected area management category system published by IUCN in 1994. It also relates to a number of other publications in the IUCN/Cardiff University Best Practice series. A full list of these is to be found on the inside cover of this volume.

Particularly relevant are the following:

- No. 1 (1998) *National System Planning for Protected Areas*
- No. 4 (2000) *Indigenous and Traditional Peoples and Protected Areas*
- No. 6 (2000) *Evaluating Effectiveness: a Framework for Assessing the Management of Protected Areas*
- No. 8 (2002) *Sustainable Tourism in Protected Areas: Guidelines for Planning and Management*
- No. 9 (2002) *Management Guidelines for IUCN Category V Protected Areas: Protected Landscapes/Seascapes*
- No. 11 (2004) *Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation.*

Audiences for the Guidelines

The intended audiences of these Guidelines are:

- protected area managers;
- forest managers;
- ecosystem or landscape-scale planners;
- forest policy people, including those dealing with international conventions and programmes which concern forest issues;
- managers of data on protected areas and forests;
- land-use policy decision-makers and planners;
- those involved in forest certification;
- non-governmental conservation organisations; and
- those responsible for collating and reporting national and sub-national level statistics on forests and protected areas.

A final point: forests are of course only one part of the landscape. Some of the advice contained here could be relevant, with appropriate adaptation, to other biomes, such as marine, wetlands, savannah, tundra and drylands.

Structure of the Guidelines

Following this introduction, Part I of these ***Guidelines*** is organised as follows:

- Chapter 2 discusses Forests and the land-use mosaic as the context in which Forest Protected Areas need to be established and managed.
- Chapter 3 provides an introduction to the IUCN Protected Area Management Category System. It explains the concept of a Forest Protected Area and also gives guidance on what is *not* a Forest Protected Area. It advises too on how to apply the system in the case of forests. (It is cross-referenced to Part II, which contains a number of case studies).
- Chapter 4 considers how other forms of forest protection and good management complement and enhance protected areas within an overall land-use mosaic in forest-dominated landscapes. (It, too, is cross-referenced to the case studies in Part II).

Part II contains a number of case studies to illustrate the application of the guidance given in Part I. Through practical examples, these show how Forest Protected Areas occur in all IUCN protected area management categories and illustrate the various forms of forest protection which complement Forest Protected Areas.

2. Forests and the land-use mosaic

The word "forest" embraces a wide range of different ecosystem types, all characterised by the presence of significant numbers of trees: forest ecosystems include dense tropical moist forests, sparsely-covered dry tropical forests, a wide array of temperate forest types and the vast boreal forests that stretch around the sub-polar regions. Through mangrove ecosystems, they even include forests that edge their way into the world's oceans.

What is a forest?

There is considerable dispute about what constitutes a forest or – perhaps more accurately – where a forest changes into something else, such as a savannah or tundra or heathland ecosystem. Most definitions rely on percentage of canopy cover although this on its own does not provide a very accurate or substantial description. What some ecologists in an arid zone might define as a forest would, in other situations, be considered as grassland or savannah with occasional trees (sometimes known as an "orchard savannah"). For many years, the UN Food and Agriculture Organization (FAO) maintained different definitions for the tropics and temperate zone. However, since 1998, FAO and the UN Economic Commission for Europe (UNECE) have worked to an agreed set of definitions, outlined in Box 3 below, which now enjoy general acceptance (FAO, 1998).

Box 3. UNECE/FAO definition of forest

Forest: Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity *in situ*. A forest may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground, or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 per cent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.

Includes: Forest nurseries and seed orchards that constitute an integral part of the forest; forest roads, cleared tracts, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas, such as those of special scientific, historical, cultural or spiritual interest; windbreaks and shelterbelts of trees with an area of more than 0.5 ha and width of more than 20 m; plantations primarily used for forestry purposes, including rubberwood plantations and cork oak stands.

Excludes: Land predominantly used for agricultural practices.

Other wooded land: Land either with a crown cover (or equivalent stocking level) of 5-10 percent of trees able to reach a height of 5 m at maturity *in situ*; or a crown cover (or equivalent stocking level) of more than 10 percent of trees not able to reach a height of 5 m at maturity *in situ* (e.g. dwarf or stunted trees); or with shrub or bush cover of more than 10 percent.

These definitions are inevitably approximate and, particularly in arid zones or at the forest tundra interface, some governments include areas with slightly less crown cover if they have the ecological characteristics of forests and woodlands.

Does the FAO definition fit the needs of Forest Protected Areas?

As discussed below, one of the characteristics of a protected area is that it is protecting predominantly natural or associated cultural features, and thus a more restricted interpretation of the FAO definition will be needed for a Forest Protected Area However, some protected areas are being established in places that have already undergone considerable degradation and where active restoration programmes are needed to rebuild ecosystems. While this is often undertaken through natural regeneration, in some cases artificial means of restoration have been attempted – such as the use of *Gmelina* plantations and orange peel waste compost to provide a nurse crop and regeneration medium for natural forest regeneration in Guanacaste, Costa Rica. Some protected areas also protect old cultural forest habitats which have developed an associated biodiversity over time – such as olive groves or cork oak forests in the Mediterranean countries. In light of these developments, ***Guidelines*** are recommended on how to interpret the UNECE/FAO definition of a forest (see Box 4).

Box 4. *Guidelines* on the interpretation of the UNECE/FAO definition of a forest for use in classifying Forest Protected Areas

Policy guidance: The UNECE/FAO definition (see Box 3) should be used for forests in Forest Protected Areas with the following caveats:

- Planted forests whose principal management objective is for industrial roundwood, gum/resin or fruit production should *not* be counted
- Land being restored to natural forest *should* be counted if the principal management objective is the maintenance and protection of biodiversity and associated cultural values
- "Cultural forests" should be included, *if* they are being protected primarily for their biodiversity and associated cultural values

This means that exotic plantations will almost always be excluded from statistics of Forest Protected Areas, *whether or not they fall inside the boundaries of protected areas as defined by IUCN*. The only exceptions would be where exotic plantations have been deliberately established and managed as nurse crops to promote natural regeneration, or are subject to a management plan to convert them from industrial use to regimes more suited for biodiversity conservation.

A range of management regimes

Along with a diverse range of forest types, there is a similar diversity in forest management regimes. At some stage in the past, if not at present, most forests have been subject to human intervention. Many apparently "natural" forests have been subtly altered by management of some kind, such as collection of non-timber forest products, selective cultivation, forest farming and

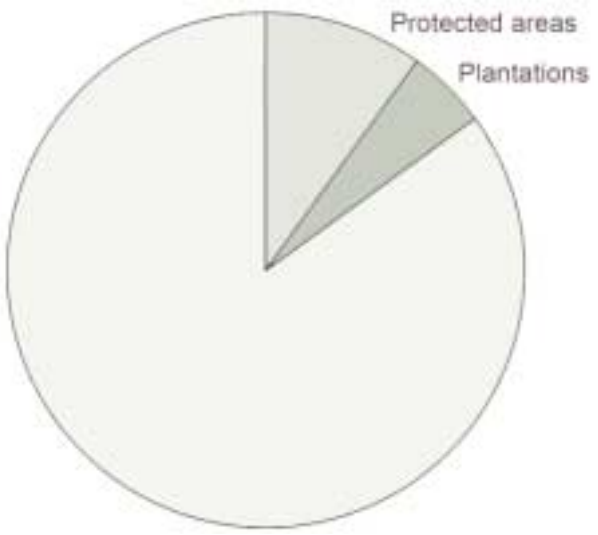
alteration of age structure and species composition through the use of fire. The removal of key animal species also affects the structure and functioning of forest ecosystems. As development pressures increase, intervention tends to become more intense, and can include selective logging, replanting, active thinning and other forms of management. At the extreme, this may involve the conversion of forests into exotic monoculture plantations, which are more akin to agricultural crop systems than natural forest ecosystems. While all these very different tree-covered habitats are generally referred to as "forests", official statistics have recently begun to distinguish between natural forests and plantations.

Management decisions do not necessarily imply intervention – management can also include a decision to leave a forest alone. Within protected areas, many – but by no means all – forests are deliberately left for natural processes to proceed. But sometimes the ecosystem may have been so severely altered that continued intervention is needed to maintain biodiversity values, to preserve traditional cultural landscapes or because protection regimes allow some limited harvesting for subsistence purposes. Some forests and woodlands outside protected areas are also deliberately left un-managed (usually known as "protective forests"), for example to reduce avalanches or flooding, to maintain pure drinking water supplies, as recreational areas, for spiritual or security reasons or simply because management is not commercially viable. Although conservation management regimes may result in a forest stand that contains many of the structural and floristic characteristics of a Forest Protected Area, that alone does not provide a sufficient basis on which to recognise it as such.

The forest estate

Presently, around 11.5 per cent of the world's forests are in some form of officially recognised protected area and listed in the *UN List of Protected Areas*, and around 5 per cent are plantations (FAO, 2000). This is a global average, and the proportion of forests in protected areas and under plantations varies greatly between individual countries. The remaining area of the world's forests are under management regimes ranging from being left completely alone to being subject to intensive intervention such as coppicing, or clearfelling and replanting – see Figure 1 below.

Figure 1. Proportions of forest management types



The global forest mosaic
Around 11.5 per cent of the world's forests are in IUCN-recognised protected areas and 5 per cent consist of intensive monoculture plantations. The remainder are managed in a range of ways that can include being protected for strategic or environmental reasons. Part of the aim of the current guidelines is to help distinguish official protected areas from other forms of protective forest.

In most countries, the forest estate will include a variety of management regimes. Examples include: forests in protected areas, conservation forests set aside for other reasons, plantations and other forests for timber production or other products which meet economic or community needs, recreational forests and – in some parts of the world – forests which are the homes of indigenous peoples. While in virtually all countries, the principle of designating forests by main management aim is now recognised and applied, countries differ in the extent to which they manage most or all of their forests for multiple purposes, or manage different areas of forests for separate and specific purposes. Likewise, management responsibility is also varied: it may lie with different parts of central, provincial or local government, local communities, indigenous peoples, private individuals, commercial companies (e.g. logging companies), not-for-profit bodies and many more besides.

The concept of sustainable management

In principle, all forests should be managed sustainably, including management systems that entail leaving the forest untouched. According to a wide range of globally agreed principles (from the 1992 Earth Summit and its follow-ups, the International Labour Organisation, principles from indigenous peoples' organisations etc), *all* forest management should be subject to environmental and social safeguards. The Forest Principles agreed in Rio state:

> *"Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations" (United Nations, 1993).*

The situation in forests is mirrored more generally in wider land uses: again there is a wide range of conditions and also of land-use practices, from protection to intensive development. These should also be subject to the sustainable development principles agreed at Rio in 1992. The forest estate therefore fits into a wider mosaic of land uses. Similarly, Forest Protected Areas normally form parts of a wider protected area network: many individual protected areas, and practically all national protected area systems, will include both forested and non-forested areas (see Davey, 1998).

So good management (including various forms of protection) should apply to *all* forests – but only some will be Forest Protected Areas as defined in these Guidelines.

Forest Protected Areas and conserved forests

The fact that a forest is sustainably managed – or even conserved – for example, to maintain supplies of clean drinking water or to minimise soil erosion, is not of itself enough to make that forest a protected area. Many governments already reflect this in their forest statistics by distinguishing between "Forest Protected Areas" on the one hand, and "protective forests" or "protected forest areas" on the other. Other governments do not make such clear distinctions.

This has resulted in some confusion about these different roles, perhaps especially in Europe. The issue however is not just to be clear on definitions (dealt with in Box 1 above and Chapter 3 below) but also how Forest Protected Areas should relate to other protected areas and to the rest of the forest estate. This is needed because Governments and conservation organisations are scaling up their conservation efforts, in accordance with the requirements of the Convention on Biological Diversity (CBD) and its "Ecosystem Approach" and the commitments made regarding

protected areas at the Seventh Conference of Parties in 2004 and the CBD *Programme of Work on Protected Areas*. As they do this, the focus of attention moves from individual protected areas to protected area networks, and then to the way in which protected areas relate to the rest of the landscape mosaic. Conserved forests and well-managed forests can play a key role as buffer zones around protected areas, in forming parts of ecological and conservation corridors between them, and generally in helping to maintain biodiversity and ecosystem functioning in the wider landscape. Often, there is a need to restore damaged forest systems as well. The idea of forest protection outside Forest Protected Areas is explored further in Chapter 4.

The contribution to the conservation mosaic made by a range of forest types should be properly recorded and recognised, but it can be counter-productive to force *all* these areas into the IUCN definition of "protected areas", because it confuses and dilutes the potential roles of the latter. These guidelines are predicated on the assumption that while Forest Protected Areas and forests managed for other conservation purposes can both have wider benefits for environment and society, and that there can be some overlap between the two, it is important not to confuse the two different management aims.

There are important links between the establishment and management of Forest Protected Areas and the management of the forest estate as a whole. Thus with the widespread adoption of science-based, landscape-level conservation planning, a more systematic approach to protected area planning is possible, including the use of a full range of protected area management categories. The proportion of more strictly protected areas (those in Categories I–IV) needed to maintain biodiversity in a landscape will vary depending on management choices elsewhere: they will need to be larger if the rest of the landscape is managed in ways that are incompatible with biodiversity and ecosystem functions: conversely, if the landscape is generally supportive of biodiversity, the amount of land that needs to be dedicated to strict protection can be correspondingly less.

3. Protected areas and Forest Protected Areas

This Chapter aims to answer three key questions:

- What is a protected area?
- What is a Forest Protected Area?
- What is *not* a protected area?

What is a protected area?

In answering this question, these Guidelines draw on the advice published by IUCN following the adoption of IUCN protected area management categories at the 1994 IUCN General Assembly (IUCN, 1994). These have been widely applied and are increasingly recognised as a valuable aid to the understanding of protected areas at the national and international levels. They are used by governments, the United Nations system (including UNEP-WCMC), leading conservation NGOs and others in the planning and management of protected areas.

IUCN has adopted a *definition* of a protected area (see Box 1). However, because of the wide range of different types of protected area, further guidance is given by division into six *categories*, defined by management objective, as outlined in Box 2 and described in more detail below.

Box 5. The IUCN Protected Area Management Category System

Defining protected areas

No site can be considered to be a protected area unless it meets the over-arching definition: *an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means*. Within this definition, IUCN further classifies protected areas into six management categories, which are based on primary management objectives, ranging from strictly protected nature reserves to areas that combine biodiversity protection with a range of other functions, such as resource management and the protection of traditional human cultures. The six categories are:

Category Ia: area managed mainly for science – an area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring

Category Ib: area managed mainly for wilderness protection – large area of unmodified or slightly modified land and/or sea, retaining its natural characteristics and influence, without permanent or significant habitation, which is protected and managed to preserve its natural condition

Cont.

Box 5. The IUCN Protected Area Management Category System (cont.)

Category II: area managed mainly for ecosystem protection and recreation – natural area of land and/or sea designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible

Category III: area managed mainly for conservation of specific natural features – area containing specific natural or natural/cultural feature(s) of outstanding or unique value because of their inherent rarity, representativeness or aesthetic qualities or cultural significance

Category IV: area managed mainly for conservation through management intervention – area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats to meet the requirements of specific species

Category V: area managed mainly for landscape/seascape conservation or recreation – area of land, with coast or sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area

Category VI: area managed mainly for the sustainable use of natural resources – area containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while also providing a sustainable flow of natural products and services to meet community needs

Source: IUCN, 1994.

The definition used by the Convention on Biological Diversity

The IUCN definition is similar to one adopted by the CBD, although the CBD definition focuses more narrowly on the role of protected areas in biodiversity conservation:

> ***Protected area*****:** *A geographically defined area that is designated or regulated and managed to achieve specific conservation objectives*

Parties to the CBD obviously see no conflict between the two definitions, as evidenced by their support for the use of the IUCN Categories during the Seventh Conference of Parties in February 2004. They stated that the conference:

> *Recognises 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.

Aims of the IUCN categorisation system

One of the main reasons for developing the IUCN category system was to help clarify the intentions of governments and others in designating land (or water) for protection. The names given to protected areas at the national level can be deceptive: for example the term "national park" has been used for everything from a strict category Ia protected area to a formal urban garden that does not qualify under any IUCN category of protected area. The categories therefore provide an international framework, which interprets and classifies national protected areas in a consistent manner – thereby providing a "common language" for all involved in protected area planning and management. IUCN's advice is that national protected area agencies should first decide how a particular area should be managed, if necessary using their own national system of protected area types, and only then assign each type to one of the IUCN categories. In that sense, the category system as devised in 1994 was intended to be more indicative rather than prescriptive.

A fundamental principle in the development and application of the categories system is that assignment is on the basis of management objective, including levels of protection, restrictions on use and so on. This means that candidate protected areas are assigned an IUCN category according to the purposes set out in legislation, management plans or other means. They are not determined according to the governance and management arrangements nor the ownership of land and water. Nor is the assignment a statement of the effectiveness of the management of the protected area; nor indeed of the outcome of management. This rule applies to Forest Protected Areas just as much as to any other kind of protected area.

Nonetheless, there is a particular interest at present in the governance of protected areas as reflected in different management regimes. Thus Recommendation 17, adopted by a workshop at the Vth World Parks Congress (Durban, 2003), recognises "at least four broad governance types applicable to all IUCN protected area categories":

- Government managed
- Co-managed (i.e. multi-stakeholder management)
- Privately managed
- Community managed (community conserved areas)

More specifically in relation to the last governance type, Community Conserved Areas (CCAs), Recommendation 26 promotes "CCAs as a legitimate form of biodiversity conservation and, where communities so choose, they should be included within national systems of protected areas through appropriate changes in legal and policy regimes". Where CCAs meet the IUCN definition of a protected area, they should indeed be so recognised and this fact entered in national and international data records of protected areas. This was reinforced by Resolution 3.018 of the Third World Conservation Congress, Bangkok, 2004.

Applying the IUCN categories in practice

Although the system is now recognised as the principal international framework for categorising protected areas it has become clear that there are varying interpretations in relation to their application. The categories are also now on occasions being used in ways that were perhaps not originally envisaged: for example as a basis for politically sensitive data collection on specific types of protection; or to argue that prescribed land uses such as mining should be excluded from certain categories (Bishop *et al*., 2004). This means that government reporting in international arenas on the extent of their Forest Protected Areas (and the categories to which these are assigned) becomes both politically important and potentially controversial.

In the specific context of the subject of these Guidelines, some practical problems have arisen over the application of the system to the protection of forests. Confusion can occur if the definitions of the six categories are used in the absence of the over-arching definition of a protected area (see Boxes 2 and 5). For example, in the 2000 UN Temperate and Boreal Forest Resources Assessment, some countries classified *all* their forests as being Forest Protected Areas, as they believed that all managed forests fitted the definitions given in Categories V and VI. But in fact no country had all their forest "especially dedicated to the maintenance of biological diversity" (Anon, 2000). As a result, some governments favoured setting up a different system to the IUCN categories, and the Ministerial Conference on the Protection of Forests in Europe has drawn up its own *MCPFE Classification of Protected and Protective Forest Areas in Europe* (MCPFE, 2001 and 2003) – see Table 1.

Table 1. Classification system being applied by the Ministerial Conference for the Protection of Forests in Europe and the UNECE/FAO

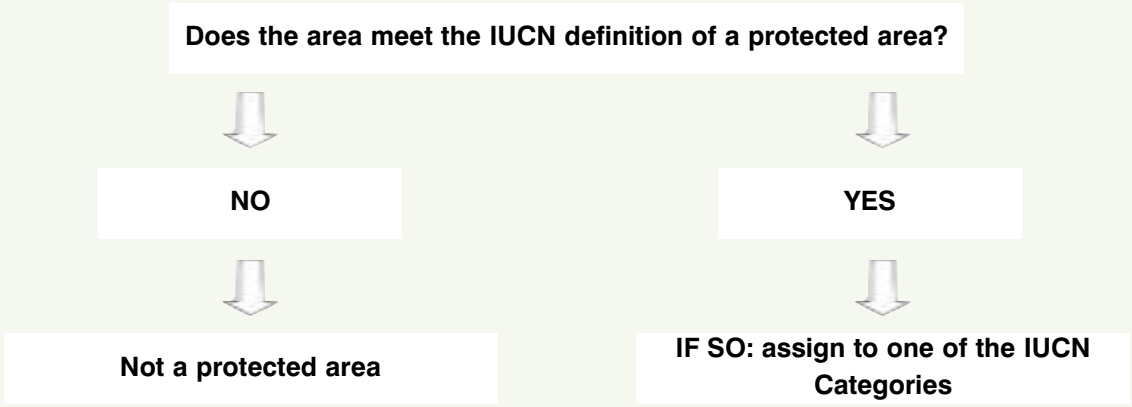
MCPFE classes		**Equivalent IUCN categories**
1. Main management objective: "biodiversity"	1.1 No active intervention	Ia + Ib
	1.2 Minimum intervention	II
	1.3 Conservation through active management	IV
2. Main management objective: "protection of landscapes and specific natural elements"		III, V, VI
3. Main management objective: "protective functions"		n/a

IUCN favours the use of the IUCN categories system, whose standing was recently reinforced by the CBD. However, to avoid confusion, the IUCN system should be applied sequentially and systematically (see **Guidelines** in Box 6).

Box 6. Guidelines on applying the IUCN Protected Area Management Category System

Policy guidance and interpretation:
Much of the potential confusion about what is or is not a protected area can be avoided if the hierarchical nature of the definition is stressed, and the system is applied sequentially. In short, the categories are only to be applied if the area in question already meets the definition of a protected area.

The process of assignment should therefore *begin* with the IUCN definition of a protected area and then be *further refined* by reference to the IUCN categories:



It follows that ***any area that appears to fit into one of the categories based on a consideration of its management practices alone, but which does not meet the general definition of a protected area, should* not *to be considered as a protected area as defined by IUCN.***

What is a Forest Protected Area?

IUCN categories are intended for all kinds of protected area. Some of these may consist entirely of forests, others will contain only a proportion of forest, and some again will have no forest at all. It may therefore be necessary to define Forest Protected Areas as a separate "element"– not only for management purposes but also for resource assessments and reporting, regional criteria and indicator processes and to improve public awareness and participation.

A Forest Protected Area is defined here as "a subset of all protected areas that includes a substantial amount of forest as defined for the purposes of Forest Protected Areas. This may be the whole or a part of a protected area"(see also Box 1).

Note that some kinds of forests are excluded from this definition, and in particular commercial plantations – *see further explanation in Chapter 3.* This calls for interpretation and additional guidance.

Applying IUCN categories to Forest Protected Areas. Even after a protected area has been correctly identified, mistakes are possible in deciding into which category to assign it. Two questions arise:

- *How much of a protected area should be forest before it is counted as a Forest Protected Area?* Some important forests within protected areas may in fact be a minority habitat, such as relic forests, riverine forests and mangroves. This creates problems of interpretation and data availability.

- *Is all the forest in a protected area automatically Forest Protected Area?* Some protected areas, particularly Categories V and VI, may contain areas of forest that **do not meet the definition of a forest proposed for use in protected areas outlined in Box 1** but currently they are sometimes recorded as being "protected" – and thus can appear in official statistics as "Forest Protected Areas". Examples include exotic plantations in Category V protected areas in Europe.

It is important that a standardised procedure is followed in determining the extent of Forest Protected Areas that gives meaningful and accurate data. Calculation should follow the sequence shown in the ***Guidelines*** in Box 7. Forest Protected Areas can be calculated as an unambiguous subset of national protected area statistics, capturing information on all protected forests but eliminating plantations and other forests managed for industrial purposes within the less strictly protected categories.

Box 7. *Guidelines* on calculating the extent of Forest Protected Areas

Calculation of Forest Protected Area includes the following steps:

Calculate proportion of forest in the protected area

↓

Remove any area of forests that do not meet the definition proposed for use in Forest Protected Areas of a forest: i.e. industrial plantations for timber

↓

= Forest Protected Area

Strict reserves (e.g. Category I or II) will sometimes exist inside less restrictive protected area categories (e.g. Category V or VI). To avoid the problem of counting the same area twice, where one category is nested within another, its area should be subtracted from the total area of the larger protected area and accounted for separately.

What is *not* a Forest Protected Area?

Many forests outside formal protected area networks also provide benefits for biodiversity and the wider environment. Forests serve a wide variety of uses, many of which include some elements of protection. They may also explicitly exclude timber harvest and other forms of exploitation. Examples include forests that are set aside for avalanche control, watershed protection or as a future strategic resource. Many governments are gradually handing responsibility or control of some state lands to private or communal interests, sometimes including indigenous peoples' groups, and these new managers often include conservation and protection amongst a number of other management aims. This section of the Guidelines advises on how far such areas should be considered as Forest Protected Areas.

***Separating protected areas from other forms of non-harvest, community or privately managed forests*.** There is a potential confusion between forms of forest management that control or exclude some management actions, and protected areas as defined by IUCN. This confusion is particularly so in the case of protected areas in Categories V and VI, which are set up *inter alia* to help preserve traditional cultures and lifestyles and may include a variety of forest uses, whilst still being managed to maintain the natural and cultural values associated with biodiversity. (Harvesting is not an appropriate form of management in Categories I–III, and only appropriate in Category IV if directly connected to maintaining biodiversity, as in some traditionally managed coppice woodland reserves). Box 8 recalls published IUCN guidance on forests and Category V and VI protected areas.

Box 8. Forests and protected areas in Categories V and VI

IUCN has published advice on forests in relation to Categories V and VI, though it is of a different kind. That on Category V relates to the management of such areas, whilst that on Category VI sets out the minimum requirements for recognising protected areas as in this category.

Category V advice:

"In most types of protected areas, "forests" mean the remaining natural areas under trees. There will be such natural forests ('old growth', ancient, pristine or virgin forests) in many Category V protected areas too, but other kinds of woodland and forests will also be commonplace. Examples are: woodlots, small plantations, community woodlands, hedges and copses, shelter belts, sacred groves and other people-protected woodlands, fragments of riverine or hilltop forests, tree cover maintained for soil conservation or watershed protection – and so forth. So in Category V protected areas, forests and trees play a complex role".

"However, forestry and woodland policies for the protected area as a whole will need to be broken down to reflect the many different kinds of forests and woodlands which are often found within a Protected Landscape and the values ascribed to them by society. These might be listed under a number of headings, according to the main functions of the treed area and appropriate policies, for example:

- forests/woodlands managed as nature reserves (often called 'micro reserves' in Latin America), where nature protection will have priority;

Cont.

Box 8. Forests and protected areas in Categories V and VI (cont.)

- commercial forests/woodlands, which are primarily managed for renewable supplies of timber;
- recreational forest/woodlands, which are primarily managed for their recreational value for local people and visitors;
- community forests/woodlands, which are managed primarily to serve the needs of the local community for food, energy, and materials;
- forests/woodlands managed as reserves for the sustainable off-take of wild animals, and other non-timber products like honey;
- watershed forests/woodlands, which help to protect water supply (quality and quantity) for downstream communities (within or outside the protected area);
- small woodlands for use in the farming system, such as hedges and copses, for soil control measures or for sporting purposes; and
- other woodlands, such as ornamental plantations or arboreta".

"The management of forests in Protected Landscapes could be assisted through the work of the Forest Stewardship Council (FSC). This is an international non-profit organisation that supports environmentally appropriate, socially beneficial, and economically viable management of forests. The FSC's international labelling scheme for forest products is a credible guarantee that the product comes from a well-managed forest. FSC also supports the development of national and local standards to encourage forest stewardship at the local level, backed up by guidelines for regional certification standards. Forests managed to FSC standards could be expected to make a contribution to Category V objectives". (Phillips, 2002, pages 64/65)

Category VI advice:
The principal purpose of this category is the management for long-term sustainable use of natural ecosystems. "*The key point is that the area must be managed so that the long-term protection and maintenance of its biodiversity is assured.* In particular, four requirements must be met:

- the area must be able to fit within the overall definition of a protected area (see Box 3)
- at least two-thirds of the area should be, and is planned to remain in its natural state
- large commercial plantations are not to be included, and
- a management authority must be in place[6]." (IUCN, 1994, page 9)

The confusion over the place of forests in Categories V and VI may arise because of the perception that protected areas have higher political value than, for example, community-managed forests. Indeed avalanche control forests, forests set aside temporarily and even the woodland in the central reservation of motorways have all been at times called "Forest Protected Areas". Box 9 contains **Guidelines** on what should *not* be regarded as protected area under the IUCN definition.

Box 9. *Guidelines* on what areas fall outside the IUCN definition of a protected area

There are many forest uses – some with high social and ecological or biological values – that lie outside the precise IUCN definition, and some examples are given below.

The following are *not* automatically Forest Protected Areas:

- Forests managed for resource protection other than biodiversity – e.g. forests set aside for watershed or drinking water protection, avalanche control, firebreaks, windbreaks and erosion control;
- Forests managed primarily as a community resource – e.g. forests managed for non-timber forest products, fuelwood and fodder, recreational or for religious purposes;
- Forests managed as a strategic resource – e.g. as a emergency supply of timber in times of conflict;
- Forests with unclear primary management objectives resulting in biodiversity protection being considered as an equal or a lesser priority along with other uses;
- Forests set aside by accident – e.g. woodland in the central reservation or verges of motorways, forest maintained for military or security reasons.

A well balanced national forest estate requires elements of many of the forest types in Box 9. Indeed part of the confusion about interpretation might diminish if other well conserved forests were given a higher profile and greater support by the international conservation community. However, trying to squeeze as many uses as possible under the heading of "protected area" will cause confusion, artificially overestimate the achievement in biodiversity conservation targets, and devalue the protected area network.

Nonetheless, many forests and woodlands in private, community, indigenous and NGO ownership, (or in other forms of land tenure that ensure responsible stewardship) will meet the IUCN definition of a protected area. And even when the entire forest area concerned will not qualify as a protected area, there may be areas within it that do. Examples include protected areas established within community woodlands, and areas set aside for strict protection within commercial forest land, for example as a prerequisite for forest certification through the Forest Stewardship Council (FSC): (usually at least 5 per cent of forest needs to be set aside under FSC rules). Such reserves meet the IUCN definitions, as long as they have prioritised and clearly articulated management objectives for biodiversity protection, adequate and long-term security, credible tenure and specific management objectives compatible with the IUCN definition.

There are various options for deciding when a private protected area is secure enough to ensure that it should be counted as part of a national protected area network. Some countries have a clear legal structure. In the case of Brazil, for example, this includes a specific legal obligation to protect self-declared protected areas in perpetuity and they are then included within the

regulations controlling all protected areas, which also require specific management arrangements. Other countries are investigating certification of private protected areas. Based on the foregoing discussion, Table 2 gives some examples of Forest Protected Areas and also of forests that are not protected areas.

Table 2. Examples of Forest Protected Areas, and also of well conserved forests that are not Forest Protected Areas

Type of forest	Example	Notes
Examples of Forest Protected Areas		
IUCN Category Ia protected area	Wo Long Nature Reserve, Sichuan, China	A strict nature reserve, established primarily to protect the giant panda, including a captive breeding centre.
IUCN Category II protected area	Huerquehue National Park, Chile	This national park is entirely protected (there are some properties within it, but excluded from the protected area, that are used for ecotourism). It was established mainly for the preservation of the unique *Araucaria* (monkey puzzle) forests.
IUCN Category III	Monterrico Multiple Use Area, Guatemala	This is a coastal area with the largest remaining block of mangrove in the country, plus turtle beaches and several marine communities. Mangroves are managed for protection and artisanal fishing.
IUCN Category IV	Dja Faunal Reserve, Cameroon	This is in the southeast of Cameroon in the Congo Basin. Many people live in and around the reserve including tribes of *baka* (pygmy) people. Active management is needed to control the bushmeat trade and to help restore areas of forest.
IUCN Category V	Sugarloaf Mountain, Brecon Beacons National Park, UK	The woods on the side of the mountain are owned and managed as a nature reserve by the National Trust, a large UK NGO, although limited sheep grazing is permitted within the Forest Protected Area. Surrounding hills are used for sheep pasture.
IUCN Category VI	Talamanca Cabécar Anthropological Reserve, Costa Rica	Some forest use is permitted in this reserve, particularly by indigenous peoples, but most of it remains under strict protection.

Table 2. Examples of Forest Protected Areas, and also of well conserved forests that are not Forest Protected Areas (cont.)

Type of forest	Example	Notes
Examples of forests that are *not* Forest Protected Areas		
Forest in IUCN Category V	Plantation forest within the Snowdonia National Park, Wales, UK	Although the plantation is within the Category V protected area, it is an entirely commercial, state-owned timber plantation of exotic species and as such does not constitute a Forest Protected Area.
Forest managed for environmental control	Brisbane watershed, Queensland, Australia	The catchment around Brisbane is set aside from logging and other disturbance so as to maintain the city's water supply. The forest is strictly conserved but not as a protected area as there is no special purpose of biodiversity protection, although there are some small protected areas within it.
Forest managed by the community	The local community in Kribi, west Cameroon	Local people are managing a forest under a project being facilitated by WWF. The forest seeks to provide benefits to both local people and the environment, but is not designated as a protected area (and does not have special biodiversity protection aims).
Forest managed for multiple purposes	Forests of the Jura Mountains, Switzerland	Swiss forest policy stresses multiple-purpose management, selective logging and conservation. The Jura is a valuable resource for both local communities and wildlife. However, the region is not a protected area, although there are some protected areas within it.
Forests protected by accident	Forests on the border between South and North Korea (the demilitarised zone)	Large areas of forest are completely conserved by exclusion for defence purposes, but biodiversity protection is an incidental consequence, and is vulnerable to political change.

4. Other conserved forests

Chapter 3 has made the essential distinction between Forest Protected Areas and other kinds of forests that are managed to minimise – or even avoid – any disturbance, but which do not meet the definition of a protected area given in that chapter. These are called variously "protective forests", "protected forests" or "conserved forests" – we use the last term here to minimise confusion.

The distinguishing characteristics of Forest Protected Areas derive from IUCN's basic definition of a protected area. Many forests which are not Forest Protected Areas *also* have important benefits for biodiversity. But these additional biodiversity benefits are incidental to the main purpose of the forest. As a result, they are not considered as Forest Protected Areas.

It is important to repeat that the IUCN protected area management category system is based on the objectives of management. It is also possible to analyse the other kinds of conserved forest in the same way, as is done in this chapter, and illustrated by case studies in Part II.

The changing relationship between protected areas and the wider landscape

Until the last years of the twentieth century, protected areas were generally regarded as places apart: areas that were 'set aside' for wildlife or scenic protection as the tide of development swept away natural habitats around them. A few of the world's largest protected areas may indeed be in that category. However, increasing understanding about the limitations of the "island conservation" approach – including the risks of genetic isolation, vulnerability to risk and climate change, and the limitations on natural cycles of renewal and change – has led planners to look beyond the borders of parks and into the broader landscape. Initially the focus shifted to consideration of networks of protected areas, but even these were perceived as having their limitations and latterly attention has focused increasingly on the interaction of the whole landscape mosaic at a regional scale and its overall ability to sustain and if necessary rebuild biodiversity.

Protected areas are one important part – often the most important part – of regional conservation strategies. But in most cases they need to be backed up by other sympathetic forms of land use, grading from some sites that are virtually as valuable as fully protected areas as defined by IUCN to others, such as cities or areas of intensive production, where the biodiversity value is very low. Described below are some of the forest types that provide the most significant conservation benefits outside official Forest Protected Areas. Linking all these together into a coherent conservation landscape is a huge task. However, stakeholders in many countries are increasingly working together to maximise the full range of economic, social and environmental benefits, across the whole landscapes in which they live and work.

Forests managed to maintain soil and water resources

The commonest form of forest conservation outside protected areas is the use of natural forests to provide environmental services, such as reducing soil erosion and avalanches and maintaining water flow and water quality. Many of the earliest successful attempts at reforestation, in Austria,

Japan and Switzerland for example, were spurred by concern about rapid soil erosion and catastrophic avalanche damage. A number of countries have identified various types of "conserved forests" to classify these areas.

The maintenance of high quality drinking water provides a particularly clear example of conserved forests as environmental service providers. Today half of the world's population lives in towns and cities and one third of this urban population – over a billion city dwellers – have no ready access to either potable water or adequate sanitation. An increasing number of cities recognise the benefits that conserved forests can supply in terms of maintaining potable water. Forests in catchments generally result in cleaner water downstream, thus massively reducing the costs of purification. In particular cases, such as tropical moist cloud forests, it appears that forests can increase water flow into catchments. The presence of forests can also have a local impact in ameliorating flooding.

Recent research suggests that almost a third of the world's largest cities take some or all of their drinking water from forest catchments that have been set aside from commercial management or other forms of disturbance. While many of these are protected areas recognised by IUCN – such as Catskill State Park which safeguards water for New York City – some other forests performing a similar function do not qualify as protected areas, for example those around Istanbul and Beijing. In some situations (e.g. around Panama City), active restoration is taking place in places where forests have been degraded or lost, to improve drinking water supplies. Cities are therefore utilising a mixture of forest protection, careful management and restoration to maintain their drinking water supplies, but only some of the forests involved are also Forest Protected Areas (Dudley and Stolton, 2003).

Forests managed for community purposes

In most countries there are systems under which local communities manage a proportion of the forest estate for their own needs. Many such community conserved areas are or could be recognised as protected areas as defined by IUCN since they meet the IUCN definition (e.g. the extractive reserves that have been created in the Amazon region of Brazil in collaboration with traditional rubber-tappers where the original forest cover is unaffected). However, others do not, as the main purposes of management are rather oriented to production than to protection, for example:

- Forest managed to supply large-scale timber needs, e.g. of nearby settlements
- Woodlands used intensively as grazing areas for domestic animals
- 'Temple forests' managed to provide repair material and income for religious purposes

Various structures are in place to manage such traditional uses of forest. In some countries, such as many Pacific Island States, such customary uses have long been respected. In other countries, they are only now being recognised in law, as is the case in parts of India and Nepal. Many developing countries are still wrestling with the challenge of reflecting these traditional ownership patterns in the legal system that was left behind after the colonial period. The restoration of rights over land (and water), and over their resources, is a feature of the struggle of many indigenous peoples to re-establish rights that they lost in the past. Elsewhere, such rights are being revived, for example in parts of the former Soviet Union.

Even if some community-conserved forest areas do not satisfy the IUCN definition of a protected area, they are nonetheless valuable for the emphasis they put on long-term sustainability of forest products and on multiple use; and many are also rich in biodiversity. Such areas can play an extremely important role in landscape-level conservation strategies, for example by linking protected areas, as buffer zones around protected areas or as other components of the landscape mosaic. For a fuller discussion on community-based conservation initiatives, see Borrini-Feyerabend *et al*. (2004).

Strategic reserves

Governments sometimes set aside quite large areas of forest to be kept as strategic reserves. This may be as a long-term insurance policy, to provide against a sudden unexpected increase in demand for timber or to respond to major problems in other parts of the forest estate (such as fires, pests and diseases). Such reserves may also be set up because past predictions about growth rates have proved over-optimistic, leading to a threatened shortfall in timber supplies. Reserves of this kind are most often created in less accessible places or where timber values are lower. In the short to medium term, such strategic reserves can also act as important reserves for biodiversity and can provide many of the environmental and other benefits of Forest Protected Areas. But because they are reserved for eventual use, the likelihood is that one day they will be exploited, so that they do not have the long-term security that is implicit in IUCN's definition of a protected area.

Multiple-purpose forests

Confusion arises about the classification of forests in countries where most of the forest is managed for multiple purposes, with biodiversity conservation only one among several management objectives. In Slovenia and Switzerland, for instance, most forests consist of native species and are managed through a system of selective felling, without large clearcuts and with care being taken to minimise ecological damage. The conservation community generally encourages such management and recognises its benefits within the broader landscape. However, multiple-use areas will not normally maintain or recreate fully natural ecosystems and managing a forest for multiple purposes starts from a completely different perspective from managing a Forest Protected Area. Thus these forests are not protected areas as defined by IUCN (nor are they classified as such by the countries concerned). "Multiple-purpose forestry" is also a loosely defined term and in other countries has been used to describe conventional, responsible timber management.

There are a number of ways of identifying and recognising good forest management including multiple-purpose management – for example through site-level forest certification schemes or on a larger scale through national reporting systems, such as the Montreal Process and the Ministerial Conference on Protection of Forests in Europe, which have set criteria and indicators of sustainable management. Less formally, many countries operate voluntary codes of practice or guidance for land owners and forest managers so that management maximises potential benefits for environment and society. Some certification schemes may stipulate that a proportion of the managed forests be set aside in Forest Protected Areas (for example, the national FSC standards in Sweden do this).

Recreational forests and woodlands

Many areas of forest, and more commonly small woodlands, are now dedicated primarily for recreation, perhaps for country walking and picnics or for outdoor sports like orienteering and

motor rallying. While many Forest Protected Areas include recreation amongst their management aims, not all recreational forests fit the more precise definition of a Forest Protected Area. In Finland, for instance, 30 per cent of privately owned woodlands are now managed primarily for their recreational value, mainly around summer houses. But many owners continue to fell trees and remove old and dead timber for amenity purposes, although these are amongst the more important elements in the forest from a conservation perspective.

Other forests are dedicated particularly to recreation of a more specific nature. In Wales, for instance, part of the Coed y Brenin state forest has been set aside for mountain biking, and has gained a worldwide reputation for the technical quality of its trails. It now attracts visitors from all over the world and the value to the local community has been estimated at several million pounds a year. A considerable portion of the forest is used as an attractive setting for recreation, but this is not a Forest Protected Area in the sense that IUCN means: the forest is predominantly a series of monoculture plantations with strictly limited value to biodiversity.

Spiritual forests and woodlands

There are many spiritual or sacred forests around the world. They include areas of particular importance to the major faiths such as Islam, Hinduism, Buddhism, Shintoism and Christianity, but also numerous sites associated with various minor faiths. Some faiths identify individual trees of particular importance. Buddhist monks decorate such trees with brightly coloured cloths (and have used this in protest against deforestation) whilst Christian communities in Estonia decorate sacred trees with paper or cloth containing prayers.

Such sacred places often retain their importance even if an individual or community converts to a different faith or adopts a secular outlook. Sacred groves that represent the homes of local gods remain important in parts of West Africa where the inhabitants have long converted to Islam or Christianity.

Many sacred sites consist of, or include, forests and this purpose ensures the protection of ancient trees and natural forests: the oldest surviving lowland forests in parts of Japan, for example, are those associated with Shinto temples. Because sacred sites are important to the local community, rather than to the government or protected area professionals, they may be better conserved than some protected areas with official status. Some sacred sites have been incorporated within protected areas, for instance the sacred mountains of the Maori people are to be found in several New Zealand national parks, such as those in the Tongariro and the Coramandel Peninsula: the latter include places where non-Maori visitors are forbidden to enter.

However, sacred forests and groves do not automatically qualify as Forest Protected Areas. For one thing, not all sacred sites are free from management interventions: for example, the *tembawang* forests in West Kalimantan Borneo double up as sacred areas and as places to collect fruit and other non-timber forest products. The *tembawang* have been planted and are managed carefully; although to the outsider they appear as relic natural forest in areas that have otherwise been converted to agriculture, in fact they are almost wholly artificial, albeit important as repositories of local biodiversity. Other sacred sites may be managed, often in subtle ways, to retain key spiritual values for the community. Importantly, communities may not *want* their sacred sites to be part of recognised protected area networks as this could encourage additional attention and the importance of sites sometimes depends in part on their secrecy.

Current views, including recommendations from the Vth World Parks Congress in Durban in September 2003, are for a more welcoming and generally inclusive approach to sacred sites within protected area systems, so that such sites can benefit from formal recognition. Guidelines about the incorporation of sacred sites into protected area networks are planned by WCPA and UNESCO. Moreover, IUCN has recognised that a better understanding of sacred sites is often a key factor in developing broad-scale approaches to protection and biodiversity conservation that enjoy public support, even if not all such areas will form part of the national protected area network.

Small woodlands for use in the farming system

In areas where ecological changes have been profound, remaining woodlands on farms can provide the best approximation to the original habitat. Sometimes these exist in rather truncated form, such as hedgerows or parkland trees (both of which can support some but not all of the original forest's biodiversity). Others are heavily managed through coppice systems that may be traced back for hundreds or even thousands of years. In countries where environmental planning has become more advanced, some of these fragments can be well preserved from further exploitation, through legal instruments such as hedgerow preservation orders and laws to prevent further clearance of native woodland. Such remnant areas can play a key role as corridors and stepping stones that help to link together and strengthen a protected area network, particularly in a heavily fragmented landscape. But they are not Forest Protected Areas as such, generally being too small, too altered and managed in ways that do not prioritise biodiversity values.

Woodland managed for sport shooting etc

Setting aside forests for hunting is almost certainly the oldest form of forest protection and in long-settled areas such as Europe many of the most important forests from a biodiversity perspective were once hunting areas. In Poland and Belarus, for example, the Bialowieza forest is the largest surviving area of "primeval" forest in the region, preserved for hundreds of years so that nobles could hunt bear and wild boar. Today the core of the forest is a Forest Protected Area and a UNESCO World Heritage site. Similar long-standing hunting reserves contain some of the most natural forests in parts of India. Hunting also continues to provide the incentive and resources to support management of near-natural forest, for example for pheasant rearing. Knock-on effects for other wildlife can sometimes be beneficial: the thick undergrowth favoured by the young pheasants is likely to help other creatures and the presence of standing and lying dead timber can provide habitats that are often absent from more intensively managed woodland. In southern and eastern Africa, private hunting reserves help to maintain stable populations of large mammals but also provide incidental woodland and savannah habitat for many smaller mammals, birds and other species. Though many such areas play an invaluable part in bioregional-scale conservation, they would not normally satisfy the criteria for a protected area.

Forests conserved by accident

Currently many of the largest remaining natural forests exist because they are remote from the development frontier, as in parts of the Congo Basin and the Amazon, or because they do not contain valuable timber, as is the case with many of the more northern boreal and tundra edge forests in Russia and Canada. However, this accidental protection does not guarantee the forest's future: the development frontier is moving rapidly and previously uneconomic forests can become valuable (and hence vulnerable) if the price of timber changes or if technology or new transport infrastructure allows new species or new forest areas to be exploited. Until recently, many northern birch forests were left untouched because the timber had little value: now new paper-

making techniques allow the incorporation of birch wood and, for example in parts of Alaska, this has led to exploitation of forests that were at one time considered to be "safe" from commercial extraction.

Ornamental gardens and arboreta

Formal gardens and arboreta can also play an important conservation role through the preservation of rare species and sub-species, although this aspect is seldom fully developed and most are artificial habitats, involving the growing of exotic species and are predominantly aimed at aesthetic or recreational roles. Some formal gardens are attached to Forest Protected Areas, such as the Kirstenbosch Arboretum at the edge of Cape Town, South Africa, which extends into the neighbouring national park surrounding Table Mountain. Others contain remnant vegetation but over too small an area to maintain its associated biodiversity: examples include the gardens in Entebbe, Uganda and at Bogor, Indonesia (at Bogor, research has shown how bird diversity has decreased over the decades since the surrounding forest was removed).

Military zones

In many countries, the military control forests for two main purposes: a buffer along disputed border areas and as training grounds. Some of the least disturbed forests in the world are to be found in the vicinity of disputed national borders. A prominent example is the border area (demilitarised zone or DMZ) between North and South Korea. Until a decade ago, the forests in Finnish and Russian Karelia were similarly preserved in a fairly untouched state, because the area had largely been depopulated following the Second World War. However these areas only stay unaltered as long as military tensions remain high and the intense debate about the forests of Karelia – in a post Cold War situation – shows that military zones provide no long-term protection. Although training grounds are by their nature heavily impacted, they can also contain high levels of biodiversity as some armed forces work hard to maintain wildlife values in their land. Around Zeist in the Netherlands for example, army tank training areas are, in addition to their military purposes, also managed to maintain a forest-heath mix that is suitable for the nightjar (*Caprimulgus europaeus*) to breed, providing important habitat for this otherwise threatened bird.

Defining the status of corridors and buffer zones associated with Forest Protected Areas

Many forested areas form corridors between the protected areas to allow species to move between them, or buffer zones to provide an extra layer of protection for the biodiversity and other values that the latter contain. They can also sometimes act as "stepping stones"; that is more isolated areas of natural habitat that provide way stations for migrating or mobile species that have difficulty crossing large areas of inhospitable habitat. While corridors, stepping stones and buffer zones are integral parts of many protection strategies, they often have no official protected area status. Terms like "biological corridor", "conservation corridor", "ecological stepping stone" and "buffer zone" are descriptions of management practices or landscape functions and do not automatically confer protected area status. Conservation in such areas is often achieved through time-limited voluntary conservation agreements without permanent commitment. Indeed many of those who are prepared to support conservation efforts on such a voluntary basis would strongly resist protected area status for land or water that they control. Table 3 sets out **Guidelines** on how to distinguish different "linking" elements in a protected area network, describes their purpose, and gives examples.

Table 3. *Guidelines* on distinguishing biological corridors, stepping stones and buffer zones inside and outside protected areas

Element	Description	Examples
Biological corridor	Area of suitable habitat, or habitat undergoing restoration, linking two or more protected areas (or linking important habitat that is not protected) to allow interchange of species, migration, gene exchange etc	**Protected areas** ▪ Designation of an area of forest linking two existing protected forests as a fully protected area with an IUCN category **Not protected areas** ▪ Areas of forest certified for good management between Forest Protected Areas ▪ Area of woodland, connecting two protected areas, voluntarily managed for wildlife by landowner on a temporary basis ▪ Areas of forest covered by a conservation easement held by government or private conservation organisation
Ecological stepping stone	Area of suitable habitat or habitat undergoing restoration between two protected areas or other important habitat types that provides temporary habitat for migratory birds and other species	**Protected areas** ▪ Relic forests managed to provide stopping off points for migrating birds **Not protected areas** ▪ Woodlands set aside by farmers under voluntary agreements and government compensation to provide temporary habitat for migrating birds
Buffer zone	Area around a core protected area that is managed to help maintain protected area values	**Protected area** ▪ Forest area at the edge of a protected area that is opened to community use under controls that are nature-friendly and do not impact on the primary aim of nature conservation. Typically a Category V or VI protected area surrounding a more strictly protected core (I–IV). In some countries, such as Peru and Cuba, buffer zones are legally declared as part of protected area. In others, like Mexico and some states in Brazil, buffer zones are legally established as part of Biosphere Reserves **Not a protected area** ▪ Forest area outside a protected area that is managed sensitively through agreements with local communities, with or without compensation payments

Conclusions

Why the insistence throughout these Guidelines on distinguishing between Forest Protected Areas and other forms of well-conserved forests? To some extent such distinctions can never be precise and there will inevitably be grading between the two. Some decisions will always remain a judgement call rather than something that can be decided on strict criteria. But if protected areas, including Forest Protected Areas, are to have real value in the long term, they should be consistently managed to fulfil clearly understood objectives, along the lines set down by IUCN and endorsed by its members. Extending the definition to include any area of forest that has value for biodiversity, simply possesses some of the attributes of a protected area or performs some conservation function, risks weakening the values and management aims of the protected area networks that have already been established.

Conservationists have unwittingly encouraged this tendency by placing such high value on fully protected areas as defined by IUCN. But as broader approaches to landscape-scale conservation take root, so there should be more emphasis on the value of some other ways of managing the land.

So far the discussion has mainly been theoretical. Part II gives some real life examples, including Forest Protected Areas in various IUCN categories, forests in protected areas that would not qualify as Forest Protected Areas and other kinds of conserved forests. As far as possible, examples are selected from many different parts of the world, so as to help clarify further some of the issues discussed in Part I.

Part II

Case Studies

A. Case studies of Forest Protected Areas

Case studies of Forest Protected Areas in each IUCN category and of forests within a Category V protected area that is not itself a Forest Protected Area.

IUCN Category Ia Forest Protected Area: Wo Long Nature Reserve, Sichuan, China

Location and importance: Wo Long Nature Reserve is one of China's oldest "panda reserves", established in 1975 and covering 200,000 hectares. It forms an important element in the Chinese government plans for a large network of similar reserves in mountainous regions, which are the last stronghold of the giant panda and other rare species. Once spread over a large part of China, pandas have suffered from habitat loss and hunting so that only about 1100 individuals remain in the wild, confined to approximately 24 montane populations at the edge of the Himalayan plateau. The reserve contains three sub-populations, each of 35–50 individuals (Louks *et al.,* 2001).

***In situ* management:** Pandas are protected within the reserve, which also runs an important captive breeding programme. The breeding centre probably now has the greatest genetic diversity of any panda population, having 18 individuals from different populations. The government is supporting a 3km^2 acclimatisation area to help prepare pandas for their release into the wild. There have been 55 births, 42 of which led to successful raising of pandas. Success is thought to be due to supplementary feeding (because captive pandas do not have access to as wide a range of bamboo species as is available in the wild), exercising, putting young animals where they can see adults mating and improved technology in rearing (Dudley *et al.,* 2001).

Giant panda at the captive breeding station at Wo Long Nature Reserve, Sichuan, China: while most of the reserve consists of natural bamboo forest and is strictly off-limits, tourists have a chance to see pandas at a specialised breeding centre at the edge of the reserve.

Reasons for classification as a Forest Protected Area in IUCN category Ia
The reserve is predominantly forested with natural forest, which is not managed. Officially, 4000 hectares of the reserve is designated as cropland (i.e. 2 per cent of the total) and 950 families are resident in small areas, mainly from the Tibetan and Qiang communities. Apart from a small area

at the edge of the reserve and the captive breeding centre, the protected area is off limits for tourists. The only access to most of the area is for scientific research (for example the periodic survey of wild giant panda populations). The reserve is also large, supporting several distinct populations. It should be noted that although the above is the management intention, illegal degradation of Wo Long continues to cause concern and has resulted in further loss of panda habitat within the reserve. Current failure to meet all the aims of the protected area does not change its designation which is based on management aims.

IUCN Category Ib Forest Protected Area: Misty Fiords National Monument, Alaska, USA

Location and importance: Located in the southernmost part of southeast Alaska, Misty Fiords National Monument extends from Dixon Entrance to beyond the Unuk River. The western boundary is 22 miles east of Ketchikan. The Wilderness Area is part of the larger 6.7 million ha Tongass Forest Category VI protected area. The wilderness area supports many virtually untouched coastal ecosystems and covers about 924,600ha. Several major rivers and hundreds of streams are fed by misty rain and snow each year, as well as by meltwater from glaciers that begin near the Canadian border. Mineral springs and volcanic lava flows add to the unique geological features.

***In situ* management:** the US Forest Service manages the area for public use.

Low population density and inhospitable terrain favour the creation of strictly protected areas in Alaska.

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Reasons for classification as a Forest Protected Area in IUCN category Ib:
The concept of "Wilderness Area" is precisely defined in US law. The area is predominantly forested and is managed as a wilderness area primarily for biodiversity and also some adventure tourism.

IUCN Category II Forest Protected Area: Girraween National Park, Queensland, Australia

Location and importance: An 11,438 hectare protected area in Queensland, south of Stanthorpe, established in 1932. The park has a weathered, granite landscape featuring many bernhardts and tors, some long, narrow perched swamps and a layered, sclerophyll forest dominated by various eucalypt species. There are several species endemic to the protected area, including the tree *Eucalyptus scopaiia* (see photograph) and some shrubs. Fauna includes the common wombat (*Vombatus hirsutus*) and the superb lyre bird (*Menura superba*). Some areas have been disturbed by previous agricultural and horticultural use and these are regenerating slowly.

***In situ* management:** The protected area is natural habitat, managed entirely for conservation. The park contains a wide network of trails and there is a visitor centre and campsite. The main management issues relate to controlling the risk of accidental fire and visitor management.

Girraween National Park was established partly because the area contains endemic species, including *Eucalyptus scopaiia*.

Reasons for classification as a Forest Protected Area in IUCN category II:
The area is fairly large, predominantly covered with natural forest and management is aimed at maintaining natural habitat and providing recreational and tourist opportunities. The protected area is a focus for tourists and visitors, and aims to cater for those interested in its natural values.

IUCN Category III Forest Protected Area: Coal River Hot Springs, Yukon, Canada

Location and importance: The Coal River Hot Springs Territorial Park was established in 1990 as Yukon's first Ecological Reserve, in a cooperative venture between the provincial government, the Liard First Nation and The Nature Conservancy. The protected area covers 1600ha. The primary purpose of the designation is to protect a series of dramatic mineral formations at the springs, which result in a series of limestone terraces descending to pools which, despite their name, are cool rather than hot. Tufa continues to build up on the site and living mosses at the edge of the pools are calcified. The pools are surrounded by forest. The surrounding area contains a rich plant life and many animals, including black and grizzly bear and wolves.

***In situ* management:** The area is completely protected and access is strictly limited partly by nature of poor access. Visitors can walk through the forest but have to ford a river that is only passable at certain times of year. Canoeists can paddle past but are then committed to a week-long trip downstream before there is easy access. Other visitors come by helicopter.

The mineral formation at Coal River springs were the reason for protection under Category III but the surrounding forest can rightly be categorised as a Forest Protected Area.

Reasons for classification as a Forest Protected Area in IUCN category III:
The main reasons for protection are the unique mineral formation at the spring, which are valued by the First Nations groups. Because heavy visitor pressure would ruin these, access is restricted. However, the bulk of the area is covered with natural forest, which is also protected, so in this case the area qualifies as a Forest Protected Area, even though the forest was not the primary reason for protection.

IUCN Category IV Forest Protected Area: forests in the Dana Nature Reserve, Jordan

Location and importance: Dana Nature Reserve covers 308km^2 in a series of valleys and mountains extending from the top of the Jordan Rift Valley down to desert lowlands. Dana is home to about 703 species of plants, 38 species of mammals and 215 species of birds. While much of the area is arid desert or semi-desert, there are also important habitats of open woodland in the valleys.

In situ **management:** The Dana protected area is managed through cooperation with local communities, including particularly Dana village. Projects have helped to develop ecotourism, including production of a range of organic herbs and locally made products for sale to visitors. Both guest house and campsite facilities are available. A key aspect of the management agreement is reduction in the number of goats grazing in Dana, which has resulted in important woodland regeneration throughout much of the area.

Dana Nature Reserve includes important woodland habitat, which is currently regenerating due to co-management agreements that have reduced pressure from goats.

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Reasons for classification as a Forest Protected Area in IUCN category IV:
In this case, the "Forest Protected Area" would refer to the woodland areas in Dana Nature Reserve. Although very different from traditional concepts of a forest protected area, the woodland in Dana represents an important example of a highly threatened habitat in a region where the climate is very arid and over-grazing by goats and other livestock is increasing desertification.

IUCN Category V Forest Protected Area: native woodland in Snowdonia National Park, Wales, UK

Location and importance: Snowdonia National Park was established in 1951 and covers 214,200ha of mainly mountainous upland areas, plus coast and valleys. The area is almost entirely a cultural landscape and human influence stretches back over thousands of years. The park contains many towns and villages (although a large slate mining area is excised) and most of the land is used for sheep farming or commercial forestry. There is a defunct nuclear power station. Tourism is increasingly important and there are thousands of miles of public footpaths along with internationally recognised mountain bike trails. As the farming industry declines, there is some natural regeneration of woodland and also the beginnings of restoration projects.

***In situ* management:** The Snowdonia National Park Authority has overall control of planning and housing and related developments are strictly controlled. However, because most of the land is in private ownership, the Authority has limited influence over farming and forestry activity (though that is changing as grant schemes are introduced to encourage environmentally sensitive land management). During the lifetime of the protected area, many parts have undergone pasture improvement and, in the past, replacement of native woodland with plantations. Remaining native woodland (much of which was replanted in the 18th and 19th centuries) is now protected from felling or replacement, although much remains subject to grazing by sheep, which can prevent natural regeneration. Several non-governmental organisations are involved in purchase and encouraging improved management of native woodland.

An area of ancient woodland in the Snowdonia National Park in Wales: some woodland is fully protected in nature reserves, while other areas are protected from felling and replacement but open to disturbance, for example through sheep grazing.

Reasons for classification as a Forest Protected Area in IUCN category V:
Although much of the native oak and birch woodland has been planted or regenerated naturally following clearance, today it contains some of the richest woodland biodiversity in the UK, being particularly rich in Atlantic bryophyte and lichen communities (partly because of a relatively pure atmosphere). Most of the remaining native woodland is protected from felling or conversion and should therefore be classified as Forest Protected Areas. Some will already be classified separately under different IUCN categories (for example the strict nature reserves within the national park) so that for statistical purposes the Category V Forest Protected Areas would be *native woodland areas within the national park that are not already listed in stricter categories*.

IUCN Category VI Forest Protected Area: Rio Macho Forest Reserve, Costa Rica

Location and importance: Rio Macho Forest Reserve is situated in the Cordillera de Talamanca, forming an 84,592ha extension of the La Amistad UNESCO Man and Biosphere Programme Biosphere Reserve, which is also a transboundary protected area with Panama and consists of a complex of protected areas of various categories. Rio Macho was established as a forest reserve in 1974 and as an addition to the biosphere reserve in 1988. The government owns 70 per cent of the reserve with the remainder in private ownership. Much of the area is under primary forest – deciduous and dry tropical – although the tops of mountains are beyond the treeline. There are several rare and threatened mammal and bird species, and the reserve has yet to be fully surveyed. La Amistad has high importance for tourism and the reserve also performs important watershed functions in terms of protecting water quality.

***In situ* management:** The reserve is divided into four zones including: a forest management zone (8125ha); recreation and environmental education zones (3125ha); agroforestry zone (1800ha); and protection forest (71,542ha), fully protected because of its inaccessibility and steep slopes. Agriculture, pasture and croplands exist in the area and there are some villages. There are several ecotourism companies offering accommodation and tours.

Rio Macho reserve is an extractive reserve added on to the existing La Amistad biosphere reserve (itself IUCN category II). Extractive reserves fit well into the concept of MAB biosphere reserves, which aim to mix strict protection with sustainable use.

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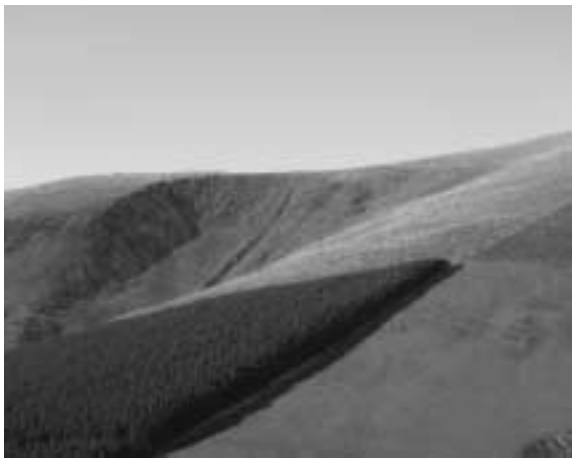
Reasons for classification as a Forest Protected Area in IUCN category VI:
The area qualifies as a Forest Protected Area because it is predominantly forest covered and the zoning and multiple use (including commercial forest management in strictly controlled areas) meet the criteria for a category VI protected area. In terms of statistical analysis, the 8,125 hectares of forest set aside for commercial management would not be included as Forest Protected Area.

IUCN Category V *not* a Forest Protected Area: exotic plantations in Snowdonia National Park, Wales, UK

Location and importance: Snowdonia National Park was established in 1951 and covers 214,200ha of mainly mountainous upland areas, plus coast and valleys (see page 43 for further details).

***In situ* management:** During the 1940s to 1980s, large areas of upland moor and some native oak and birch woodlands were cleared and planted with exotic plantations, mainly of spruce (*Picea abies* and *P. sitchensis*). Most of these areas are managed strictly for commercial timber although a small number also include biodiversity aims within their management, mainly to encourage threatened species such as the black grouse and the dormouse. A few areas are now being reconverted back to either heath or native woodland through natural regeneration.



UK forest statistics used to include areas of conifer plantations as "forest protected areas" because they occurred in Category V national parks. IUCN's revised guidance suggests that forests not meeting the overall definition of a protected area should be removed from statistics of forest protected areas even if they occur in Category V and VI protected areas.

Reasons for not classifying as a Forest Protected Area in IUCN Category V:
Despite being in a recognised protected area, most of these plantations have so far low value to biodiversity and provide few of the other amenities expected of protected areas, and therefore do not meet the overall definition of a Forest Protected Area. Therefore, for the purposes of statistical analysis, conservation planning and day-to-day management, such areas should not be considered as Forest Protected Areas. However this situation could in theory change in future if these plantations are managed in a way that is more suited to contribute to biodiversity conservation.

B. Case studies of other types of conserved forest

Forests protected to maintain water resources: forests around Stockholm, Sweden

Location and background: Stockholm, the capital of Sweden, has a population of over 1.8 million. Water supply and sewage disposal in Sweden are by law a municipal responsibility. The Stockholm Vatten company owns and manages two freshwater plants, three sewage plants, sewers and pumping stations in the Stockholm area and is also responsible for management of some of the watersheds of lakes that supply the city's water.

Management: One important source for Stockholm's water is Lake Bornsjön, which is surrounded by forests of spruce, pine and birch. Although some forestry is conducted in the watershed, management is focused on protecting water quality, concentrating particularly on measures to reduce soil erosion into the lake. As a result management has been modified in various ways: for example, many trees are left standing to protect water courses and lakes and no scarification is carried out. In September 1998, Stockholm Vatten was certified under the Swedish Forest Stewardship Council (FSC) standard, focused particularly on its role as a supplier of high quality drinking water. The Swedish standard says that FSC certified management units must include protection for a range of important forest habitat sites within commercial holdings: at least 5 per cent of certified land (excluding very small areas and areas already legally protected and compensated for by the state) must be exempt from forest management. According to the certification report for Stockholm Vatten's Lake Bornsjön watershed, areas left for conservation and restoration *"will considerably exceed 5 per cent of the productive land"*.

Sweden's forested catchments have contributed to the country having some of the purest water in the world.

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Why the forest is not a Forest Protected Area:
The water company and other land owners have clearly decided that the forest should continue to be managed commercially to some extent and that it should not be declared a nature reserve or

national park. But at the same time, management has been tailored specifically to water protection, and the company has invited a third-party certification body to verify that this is the case.

In contrast...

Bukit Timah reserve is the only significant area of primary rainforest in Singapore, preserving just 3 per cent of the island's original forest (75ha). The forest has an important function in helping to protect Singapore's drinking water supply (although the bulk of the water is piped in from Malaysia). But it is now managed primarily for conservation and recreation, and is linked by secondary forest corridors to the secondary forest of the Central Reserve Catchment (Choo Toh *et al*., 1985). It thus functions as a forest protected area (IUCN Category IV) which also has watershed functions.

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Community-managed forest: Gilgit Community Forest, Northern Pakistan

Location and background: Most villages in Gilgit, northern Pakistan, are located on alluvial fans or river terraces, surrounded by the steep and rapidly eroding mountains of the Hindu Kush. Livestock are grazed on high communal pastures in the summer and some crops are also grown. Traditional feudal arrangements to manage forests were eroded during the British colonial period and further under the government of independent Pakistan. This also resulted in the breakdown of many traditional management patterns, and since the early 1980s the Aga Khan Rural Support Programme (AKRSP) has been working in the region, with one of its aims being to develop sustainable approaches to rural forestry. Villagers opposed nationalisation of forests, but are keen to establish or improve forests on common land. AKRSP has been helping to develop Village Organisations and Women's Organisations and has supplied soft loans and technical help to develop reforestation, tree nurseries and training (Poffenberger, 2000).

Management: From 1989 to 1994, Village Organisations planted over 13 million trees in the region. Villages decided management strategies and some took drastic measures to stop continuing deforestation, including limiting collection to dead trees while growing stocks matured and mounting roadblocks to prevent illegal logging. Management continues to be a challenge and the area has suffered from periods of political instability.

Community-managed woodlands along the route of the Karakoram Highway in the Indus Valley near Gilgit, Pakistan.

Why the forests are not a Forest Protected Area:
The forests of Gilgit have been developed for commercial and subsistence needs; they are not natural and are heavily exploited. Trees include exotic species such as eucalyptus (particularly for fuelwood) and fruit trees, including particularly apricots, for which the region is famous. The villagers would resist their forests being declared a protected area (author's discussions with villagers).

In contrast...

The Baghmara Community Forest on the edge of Royal Chitwan National Park in Nepal, while not a Forest Protected Area itself, exists in the buffer zone of such an area. Villagers manage the forest on a sustainable basis and also make money by running ecotourism activities, including guided walks and elephant rides for tourists. There are clear management objectives based around biodiversity conservation.

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Recreational forest: Dyrehaven Royal Deer Park, Copenhagen, Denmark

Location and background: A former hunting park of almost 500ha, this cultivated forest is within easy reach of the capital city by car or metropolitan railway and is extremely popular with walkers, cyclists and horse riders: there are also horse carriages for hire. Many of the trees were established in the 1760s by the German forester Johann von Lange, who also introduced several new species. The landscape is made up primarily of open pasture interspersed with small clusters of oak, beech and thicket. There are red, fallow and sika deer populations and individual trees have gained a characteristic flattened shape to the bottom of their canopies due to grazing. The park is close to a popular bathing beach and at one end there is Dyrehavsbakken, one of the oldest amusement parks in the world with restaurants, beer gardens, rollercoasters and merry-go-rounds.

Management: The park is managed almost entirely for its recreational and aesthetic qualities and is a free resource for visitors. It also has value for biodiversity.

Day trippers cycling in Dyrehaven Royal Deer Park near Copenhagen.

Why the forests are not a Forest Protected Area:
Biodiversity conservation is of secondary importance. The management aims – which are successful – are for the park to provide a playground for city-dwellers and it does not therefore appear in the list of Danish protected areas. (Plans for an increase in its role in biodiversity protection could change this in the future.)

In contrast...

Nuuksio National Park near Helsinki, Finland is classified as a Forest Protected Area (IUCN Category II) although its management recognises its strong recreational function near a capital city. But in contrast to Dyrehaven, Nuuksio is predominantly natural, consisting of 1700ha of spruce and pine, natural peatlands, bogs and lakes; it also supports endangered species such as the nightjar (*Caprimulgus europaeus*) and woodlark (*Lullula arborea*). Management aims prioritise biodiversity conservation.

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Forest protected for spiritual reasons: sacred groves in Ghana

Location and background: Despite high levels of deforestation, Ghana contains many areas of forest set aside by traditional communities – variously called sacred groves, fetish groves or community forests – that remain well preserved although outside the official system of protected areas. Local people still consider them to have important spiritual values. Some of these forests are designated burial grounds for tribal chiefs but in other cases they have been conserved also to maintain watershed values or wild species that are valuable to the community (Baffoe, 2002).

Management: Responsibility for the administration of such forests rests with the entire community. Most sacred groves are not strictly protected, because they are also supposed to provide food, building materials and other resources. However, harvesting is strictly selective and controlled to maintain the resources. Access to these forests is restricted by taboos, codes and customs to certain activities and to certain members of the community.

Why the forests are not a Forest Protected Area:
Most of Ghana's remaining sacred forests are not protected areas, although many could in theory become so if their traditional owners and managers so wished. Although there is a general recognition that spiritual sites can benefit from also being protected areas and perhaps a feeling that IUCN should encourage these links, not all sacred forests meet the criteria of a Forest Protected Area. Furthermore, even where sacred forests meet all the criteria necessary to be declared a protected area, not all communities wish to have any associated formal designations and restrictions on their land.

In contrast...

In southern Madagascar, the Mahafaly and Tandroy communities are currently working with WWF to preserve biologically unique sacred forests, and WWF has recognised these as a Gift to the Earth. However, in this case there is a specific aim to work with the communities also to make these areas officially designated protected areas.

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Forest as part of an arboretum: Entebbe Botanical Gardens, Uganda

Location and background: Entebbe Botanical Gardens are one of the most important arboreta in sub-Saharan Africa, ranking along with Kirstenbosch in South Africa and Limbe in Cameroon. They were first laid out in 1898 by a Mr Whyte, who was the first curator. Stretching over several hectares on the edge of Lake Victoria, they contain a wide variety of Ugandan plants and a fragment of the original tropical forest. Today they also house the Entebbe Wildlife Education Centre, which has many wild animals.

Management: The area continues to be managed by the government as a botanical garden, although at times of political or economic difficulty it has fallen somewhat into disrepair. The botanical gardens contain a wealth of rare plant species and in addition support a wide variety of birds. As such they certainly play an important conservation role, particularly as virtually all other land so close to Kampala and Entebbe has long been converted into farmland or housing.

Uganda botanical gardens.

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Why the forest is not a Forest Protected Area:
The area is managed primarily as a garden and the relic rainforest area is so small that it retains few of the ecological attributes of a true forest. Most of the area is laid out as parkland. Most of the plants, although native to Uganda, have been transplanted from their natural habitat and are displayed in beds.

In contrast...

Part of the Kirstenbosch botanical gardens in Cape Town, South Africa, is a Forest Protected Area. While a few hectares are laid out as a classic, botanical garden, most of the land stretches up into native forest on the slopes of Table Mountain and is itself a protected area. The native woodland is managed primarily for biodiversity and recreation.

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Multiple-purpose forest: the Jura Mountains, Switzerland

Location and background: The Jura Mountains are a relatively low range that stretches from France through Switzerland on the opposite side of Lac Leman from the Alps. In the past, virtually the whole area was cleared for agriculture, particularly the summer grazing of cattle. While this continues, there was a conscious decision at the beginning of the 20th century to reforest much of the area, in part because of timber shortages and partly because of a decline in farming income. Today the area is a mixture of mature spruce and pine forest and summer meadows. Its proximity to Geneva and Lausanne means that the area is very heavily used throughout the year for walking, mountain biking and downhill and cross-country skiing. Its base rock of limestone means that the area is exceptionally rich in flowers and is also home to many animal species including the lynx.

Management: Part of the Swiss area of these mountains is in a landscape reserve – the Parc Jurassien Vaudois (Category V) and smaller areas are strict nature reserves or are protected from hunting. Most of the Jura is managed for either agriculture or forestry – with most timber products being used in the locality, including for firewood. Recent changes in Swiss forestry law mean that there is little clear-cutting (by law none at all) and trees are removed selectively, trimmed on site and processed in a number of small sawmills in the lower areas. Brash is either left or stacked and burnt.

The Jura is a classic multiple-purpose forest, reflecting the needs of many different stakeholders, from traditional farming communities to urban populations wanting an area for recreation.

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Why the forest is not a Forest Protected Area:
Apart from the relatively small areas in recognised protected areas, most of the forest is managed commercially, albeit in a sympathetic manner. The area is therefore not managed primarily for biodiversity, but for multiple purposes including timber, agriculture, tourism and recreation, and with no special policy for biodiversity conservation. The government recognises these different roles by defining small areas within the Jura as protected areas and recognising the rest as part of the managed forest estate.

In contrast...

The community forests at the edges of the River Mekong, on the border between Thailand and Laos, are included in the Phatam Transboundary Protected Area complex. Their management is integrated into the management plan of the protected areas to maintain natural and biodiversity values, and can thus be categorised as a Forest Protected Area.

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