



## CHAPTER 2

# CONCEPT, PURPOSE AND CHALLENGES

**Principal author:**  
Graeme L. Worboys

### CONTENTS

- Introduction
- Concept and purpose
- Types of protected areas: IUCN categories
- Systems of protected areas
- Status of protected area coverage
- Other international protected area and conservation types
- Challenges for protected areas
- Conclusion
- Supplementary reading
- References
- Appendix 2.1: Key IUCN World Commission on Protected Areas and related publications



Convention on  
Biological Diversity

## PRINCIPAL AUTHOR

**GRAEME L. WORBOYS** is Co-Vice-Chair, Connectivity Conservation and Mountains, International Union for Conservation of Nature World Commission on Protected Areas and an Adjunct Fellow at the Fenner School, The Australian National University.

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## TITLE PAGE PHOTO

**Gray Lake Glacier, Torres del Paine National Park, Chile**

Source: Eduard Müller





### Iguazu Falls, Iguazu National Park, Brazil

Source: Eduard Müller

## Introduction

Protected areas are the places where we aim to retain the extraordinary beauty and richness of the Earth and all its benefits to humanity—the evolutionary heritage of more than four billion years and for all we know unique in the vastness of the universe. They may include grand scenery; remarkable animals and plants; precipitous mountains; spectacular formation-rich caves; grand towering forests; dramatic plunging waterfalls; immense wetlands and lakes; vast deserts; and untouched coastlines, deep ocean mounts and expansive coral reefs. They can also hold landscapes of great beauty and cultural values, created by human communities over time and through traditional management practices.

Nations are proud of their protected areas and they are valued, loved and visited by people from all over the world. Protected areas are critical for maintaining healthy ecosystems and a healthy environment for people and all other species. They are essential for biodiversity conservation; they deliver clean water and air; they are vital to the cultures and livelihoods of traditional and indigenous communities for sustainable sustenance; they bring sustainable development benefits to millions of people through nature-based tourism; and they are a critical natural solution for climate change. They are also important for their rich history and the cultural associations they conserve including grand historical sites, and their special cultural landscapes, features and sites of spiritual, social and historical significance to a nation's peoples. They are typically protected, in perpetuity, by a nation's strongest laws.

In this chapter, we introduce important protected area concepts, including the definition of protected areas, protected area categories, governance and their management. Geographic areas that contribute to conservation other than protected areas are also introduced. The majority of IUCN protected area capacity development information developed since 1947 has been identified and listed in an annexure of this chapter to provide a single source list to assist readers and researchers.

## Concept and purpose

Protected areas and their establishment and professional management are particularly a 20th and 21st-century phenomenon, but it could surprise many that the concept of protected areas has existed for tens of thousands of years. Very old protected areas may still be found, including some where religious devotion has helped to conserve natural environments. The island of Itsukushima near Hiroshima, Japan, for example, has been a shrine to Shintoism since the 6th century and the island's sacred natural forests have been protected for their intrinsic values and for providing replacement timbers for the shrine's wooden structures (Stolton 2010). An even earlier example is Mount Kailas in Tibet, which was mentioned as a holy mountain in the 4th century BC, and is revered and protected by Buddhist, Hindu, Jain and Bon adherents, making it the world's most sacred mountain (Bernbaum 1990). In many other areas, communities have managed their activities to conserve the ecosystems that sustain them.



**Ta Promh Temple, Angkor, Cambodia**

Source: Graeme L. Worboys

## Values

Values are fundamental to the concept of protected areas. They give meaning to and provide an impetus for protected area establishment; they help establish priorities for management action and they provide a basis for assessing the condition and change in condition of protected areas in response to natural evolution, threats and management interventions (Lockwood 2006). The many values of protected areas, such as intrinsic, material, non-material and existence values, are described in detail in Chapter 6.

## Concept

The modern concept of conservation and protected areas developed in the late 19th century in response to rapid changes to lands in former European colonies and a concern over the loss of wilderness, a desire to stop species disappearing and a desire to retain natural landscapes, exceptional natural phenomena and scenery (Stolton and Dudley 2010).

The conservation movement in 19th-century Europe and North America appears to have had its origins in three sources (Holdgate 1999:1): 1) the rediscovery of the romantic in nature; 2) the scientific exploration of

the natural world; and 3) revulsion at the destruction of some wild species, especially birds. Jean-Jacques Rousseau emphasised that ‘nature was good and the closer people were to nature the freer, happier and more honest they became’ (Holdgate 1999:3). This philosophical approach helped to create a new vision of human relationships with nature in Western European culture, which was later echoed in North America by Ralph Waldo Emerson (Holdgate 1999).

In 1810, the English poet William Wordsworth said of his beloved Lake District in the north-west of England that he saw it as ‘a sort of national property, in which every man has a right and interest who has an eye to perceive and heart to enjoy’ (Holdgate 1999:4)—words that were to inspire pioneer conservationists in the United States (like John Muir) as well as in Britain. Wordsworth’s vision was in part a response to the impact of the Industrial Revolution, already well under way in England at the time. By the 1830s, the need to protect nature against the ravages of industry, the unconstrained exploitation of resources, pollution and fast-growing towns was being more widely expressed in Europe. In 1858, Charles Darwin published his influential *On the Origin of Species*, and about this time Alexander von Humboldt is credited by many with promoting the idea of nature protection; however, it was the destructive exploitation of nature (such as of the bison of North America, elephants in Africa and egrets and gulls for the fashion industry) that also proved to be a major stimulus for conservation. Many bird protection societies and the society for the protection of animals emerged at this time (Holdgate 1999).

Beyond Europe, protected areas were also inspired by the ecological impacts of Western conquest and colonisation of Africa, the Americas, Asia and Australia (Grove 1995; Chape et al. 2008). In America a lead was taken in championing the concept of protected areas. In 1833 an explorer and artist by the name of George Catlin extolled the virtues of ‘primitive’ America (Brockman 1959). He had visited Native American country of the Upper Missouri River area and wrote:

[A]nd what a splendid contemplation, too, when one ... imagines them as they might in the future be seen (by some protective policy of government) preserved in their pristine beauty and wildness, in a magnificent park ... A nation’s park, containing man and beast, in all the wild and freshness of their nature’s beauty. (Catlin 1844)





### Flamingos, Panorama, Celestún National Park, Mexico

Source: Eduard Müller

In a British colony on the other side of the world, Australia, there was also emergent conservation thinking. The importance of Bunya pine (*Araucaria bidwillii*) to Indigenous Australians was recognised by Governor Gipps of the Colony of New South Wales when, in 1842, he issued a special decree that no timber licences be issued for any rainforest north of Brisbane that contained this species (Worboys et al. 2005). It was a conservation edict that respected the values and needs of Aboriginal Australians. In 1866, the Jenolan Caves Reserve in New South Wales was established by law to protect outstanding limestone caves from vandalism (Finlayson and Hamilton-Smith 2003). In 2014, this same Jenolan Caves Reserve formed part of the Greater Blue Mountains World Heritage Property.

Two broad concepts of conservation emerged in California during the debate over the controversial 1908–13 damming of the Hetch Hetchy Valley: the preservationist concept of John Muir, which was driven by a religious reverence for nature and the idea of the essential wild as an antidote to development, and a utilitarian concept of conservation proposed by Gifford Pinchot of wise use and ‘banking’ of nature for possible future use. The debate influenced the development of an international conservation movement: ‘Dam Hetch



### Greater Blue Mountains World Heritage Property, Australia

Source: Graeme L. Worboys

Hetchy! As well dam for water-tanks the people’s cathedrals and churches, for no holier temple has ever been consecrated by the heart of man’ (Muir 1912).

The protected area concept soon spread throughout the world in the 20th century, and new areas continue to be reserved in the 21st century. Some important protected area-focused historical events since the end of World War II are provided in Table 2.1.

**Table 2.1 Some post-1945 protected area events**

Date	Event
1948	The International Union for Protection of Nature (IUPN) was formed as the first global organisation for nature protection and was based in Brussels
1956	The IUPN changed its name to the International Union for Conservation of Nature (IUCN)
1958	IUCN's International Commission on National Parks was established
1962	The first UN list of protected areas was prepared by the IUCN
1962	The First World Conference on National Parks was held in Seattle, USA
1969	An agreed definition of a national park was established by the IUCN General Assembly in New Delhi
1970	UNESCO's Man and the Biosphere programme was launched
1971	The Ramsar Convention on wetlands was adopted in Ramsar, Iran
1972	The World Heritage Convention was adopted
1972	The Second World Conference on National Parks was held at Yellowstone National Park, USA
1973	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted
1975	The IUCN International Commission on National Parks was changed to the IUCN Commission on National Parks and Protected Areas (CNPPA)
1980	IUCN, the World Wide Fund for Nature (WWF) and the United Nations Environment Programme (UNEP) prepared the 'World Conservation Strategy'
1981	UNEP's World Conservation Monitoring Centre (UNEP-WCMC), based in Cambridge, undertook responsibility for collecting and collating data on protected areas in partnership with the IUCN
1982	The Third World Congress on National Parks was held in Bali, Indonesia
1987	The report of the World Commission on Environment and Development (Our Common Future), dealing with the sustainable development agenda, was published
1988	IUCN adopted a definition for marine protected areas
1990	The first report of the Intergovernmental Panel on Climate Change (IPCC) was produced
1991	IUCN, WWF and UNEP prepared the document Caring for Earth: A strategy for sustainable living
1992	UNEP-WCMC in collaboration with IUCN CNPPA prepared a four-volume review of protected area systems of the world
1992	The Fourth World Congress on National Parks and Protected Areas was held in Caracas, Venezuela
1992	The Convention on Biological Diversity (CBD) was agreed to, recognising the need to conserve biodiversity and the essential role of protected areas in doing this
1992	The UN Framework Convention on Climate Change was achieved
1994	IUCN published Guidelines for Protected Area Management Categories
1996	The title of IUCN's CNPPA changed to the World Commission on Protected Areas (WCPA)
2000	The UN Millennium Development Goals were published and identified the need for environmental sustainability
2000	Conservation International identified its global environmental hotspots
2001	WWF published its global ecoregions
2003	IUCN's Fifth World Parks Congress was held in Durban, South Africa
2004	The Programme of Work on Protected Areas (PoWPA) was agreed to by the Convention on Biological Diversity's Conference of Parties
2008	An improved definition of protected area and IUCN management categories and governance types was approved at the Barcelona IUCN World Conservation Congress
2008	The World Database on Protected Areas (WDPA) was upgraded and launched as an online database
2010	The CBD Strategic Plan for Biodiversity 2011–20 was launched and called for further protected areas to be established, with improved connectivity, effective management and with due regard to people

Date	Event
2010	IUCN WCPA prepared 'natural solutions' to emphasise the importance of protected areas as a natural response to climate change
2011	Guidelines for protected area legislation were prepared by IUCN's Environmental Law Centre and WCPA
2014	The Biodiversity and Protected Area Management (BIOPAMA) program was undertaken by the IUCN to address threats to biodiversity in African, Caribbean and Pacific countries while reducing poverty in communities in and around protected areas

Source: Adapted from Worboys (2014).

For readers interested further in the history of conservation, protected areas and the IUCN, an excellent text on these subjects is *The Green Web* by Martin Holdgate (1999).

The global concept of protected areas has benefited greatly from this evolving post-1945 thinking, discussion and refinement, and the importance of protected areas has increased, not diminished, during this time. Contemporary protected areas are lands and seas where people and communities of Earth have recognised the special natural, biodiversity, ecological, ecosystem service and/or social and cultural values and where they have taken steps to protect these values for the long term. The concept is intergenerational and recognises that the protection is supported by community and customary rules and/or the law of the land and that the area is actively managed. The concept may relate to very small or very large areas of Earth. They may be extremely fragile areas and managed sensitively; they may sustain communities; and they may host regular visits given their outstanding natural beauty.

## Purpose

Protected areas are the principal mechanism for the conservation of biodiversity on Earth (as well as other natural and cultural heritage). This role for conserving biodiversity was formally recognised by 168 nation-states in 1992 in Article 8 of the newly created Convention on Biological Diversity (CBD). In the 21st century, nearly all nations support the concept of protected areas. These areas underpin virtually all national and international conservation strategies where land, water or sea has been identified as vital and given special protection to maintain functioning natural ecosystems, to act as refuges for species and to maintain ecological processes that cannot otherwise survive in intensely managed areas such as agricultural or urban areas (Dudley 2008). Protected areas help to protect nature and this includes biodiversity at genetic, species and ecosystems levels as well as geodiversity including geoheritage, landforms, scenery, soils and water. Protected areas also protect cultural heritage given that the status and the management of



**Uluru-Kata Tjuta National Park World Heritage Property, Australia**

Source: Graeme L. Worboys

such cultural phenomena are not inconsistent with biodiversity conservation outcomes (Dudley 2008). For the sake of conciseness, henceforward in this book whenever we speak of 'biodiversity conservation' the additional values of ecosystem services, geodiversity and cultural heritage should be understood to be included. By articulating this greater purpose of protected areas it has helped to establish a protected area definition.

## Definition

A protected area has been defined by the IUCN as '[a] clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley 2008:8).

Every word and phrase of this definition is important and has a clearly prescribed meaning. An explanation of this meaning has been prepared by Nigel Dudley of the IUCN and a summary of his description is provided here (Dudley 2008:8–9) (Table 2.2).



**Table 2.2 Details of the protected area definition**

Word or phrase	Explanation
Clearly defined geographical space	<i>Geographical area:</i> This includes land, inland water, marine and coastal areas or a combination of two or more of these <i>Space:</i> This has three dimensions and may include airspace and water column space above land or above the bottom of the water body and subsurface areas (such as caves) <i>Clearly defined:</i> Implies a spatially defined area with agreed and demarcated boundaries
Recognised	Protection can include a range of governance types declared by people as well as those identified by a nation, but such sites should be recognised in some way (such as listing on the World Database on Protected Areas)
Dedicated	Implies a specific binding commitment to conservation in the long term such as international conventions and agreements; national, provincial and local laws; customary law; covenants of NGOs; private trust and company policies; and certification schemes
Managed	This assumes some active steps are being taken to conserve the natural (and other) values for which the protected area was established. It may also include a decision of non-intervention as the best conservation strategy
Legal or other effective means	Protected areas must be gazetted, recognised through an international convention or agreement or else managed through other effective but non-gazetted means such as through recognised traditional rules under which community conserved areas operate or the policies of established NGOs
... to achieve	This implies some level of effectiveness of management
Long term	Protected areas should be managed in perpetuity and not as a short-term or temporary management strategy
Conservation	This is the <i>in situ</i> maintenance of ecosystems and natural and semi-natural habitats and of viable populations of species in their natural surroundings, and in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties
Nature	(In this context) always refers to biodiversity at genetic, species and ecosystem levels and often also refers to geodiversity, landform and broader natural values
Associated ecosystem services	These are ecosystem services that are related to, but do not interfere with, the aim of nature conservation—these can include provisioning (food and water) services; regulating services (floods, drought, land degradation and disease); support services (such as soil formation and nutrient cycling); and cultural services such as recreational, spiritual, religious and other non-material benefits
Cultural values	These include cultural values that do not interfere with the conservation outcome

Source: Dudley (2008:8–9)

## Types of protected areas: IUCN categories

The IUCN has developed an internationally accepted category system for protected areas that identifies six categories of protected areas (Dudley 2008). A specific IUCN protected area category is assigned to a protected area consistent with its principal management objective. This IUCN framework serves as a common language for distinguishing, describing and working with broad protected area management types. This is critical given nations have otherwise assigned a wide range

of descriptive terms that represent protected areas such as ‘conservation park’, ‘conservation reserve’, ‘feature protection area’, ‘flora reserve’, ‘forest reserve’, ‘indigenous protection area’, ‘karst conservation reserve’, ‘national park’, ‘nature park’, ‘nature reserve’, ‘reference area’, ‘scientific area’, and many others.

The six IUCN categories are differentiated by clear primary management objectives, and this common language helps to provide uniformity for data collection internationally and a capability for comparative analysis for the global protected area system. A definition and more specific differentiating guidelines help to define the





**Khatunsky Zapovednik, a Category Ia protected area near Ust Koksa, Altai Republic, Russia**

Source: Graeme L. Worboys

six IUCN protected area categories and each has been described here along with this guiding information. First, however, there is a set of fundamental management principles and objectives that are common to all IUCN categories.

## Principles

Principles for IUCN protected area categories help to clarify exactly what the IUCN means by protected areas and help to maintain the integrity of its categories. Consistent with the IUCN definition of a protected area, key principles for the IUCN categories are:

- only those areas where the main objective is conserving nature can be considered protected areas
- protected areas must prevent, or eliminate where necessary, any exploitation or management practice that will be harmful to the objectives of designation
- the choice of category should be based on the primary objective(s) stated for each protected area
- the category system is not intended to be hierarchical
- any category can exist under any governance type and vice versa

- protected areas should usually aim to maintain or, ideally, increase the degree of naturalness of the ecosystem being protected
- the definition and categories of protected areas should not be used as excuses for dispossessing people of their land (Dudley 2008:10).

## Objectives

Objectives of management that are common to all IUCN protected area categories include:

- conserve the composition, structure, function and evolutionary potential of biodiversity
- contribute to regional conservation strategies
- maintain diversity of landscape or habitat and of associated species and ecosystems
- be of sufficient size to ensure the integrity and long-term maintenance of the specified conservation targets
- maintain the values for which they were assigned in perpetuity
- be operating under the guidance of a management plan and a monitoring and evaluation program that support adaptive management
- possess a clear and equitable governance system (Dudley 2008:12).

## IUCN protected area categories

The six IUCN categories are individually introduced, defined and their primary objective presented. These descriptions are a critical guide for the effective management of protected areas and should always be aspirational whatever the situational circumstances of individual protected areas.

### Category Ia: Strict Nature Reserve

Category Ia Strict Nature Reserves conserve ecosystems, species and geodiversity and may be important sites for scientific research, environmental monitoring and education. They may also be important sites for conserving cultural and spiritual values associated with nature. Strict nature reserves are extremely important in the 21st century, for there are fewer and fewer areas where the activities of humans are limited. They help to protect scarce natural heritage that would otherwise be lost without this designation, and they may provide a baseline for long-term environmental monitoring as well as protecting other scarce natural resources and ecosystem services.



### Plitvice Lakes National Park, World Heritage Property, Croatia

Source: Graeme L. Worboys

#### Definition

Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring (Dudley 2008:13).

#### Primary objective

The primary objective of a Category Ia protected area is to conserve regionally, nationally or globally outstanding ecosystems, species (occurrences or aggregations) and/or geodiversity features. These attributes will have been formed mostly or entirely by non-human forces and will be degraded or destroyed when subjected to all but very light human impact (Dudley 2008:13).

### Category Ib: Wilderness Area

Category Ib Wilderness Areas help protect relatively untouched and functioning ecosystems, and consequently, provide opportunities for evolution to continue in as natural a state as possible and where

species can survive. They provide opportunities for limited numbers of visitors to experience wilderness and may also include livestock grazing by nomadic peoples.

#### Definition

Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influences, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition (Dudley 2008:14).

#### Primary objective

The primary objective of a Category Ib protected area is to protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate, so that current and future generations have the opportunity to experience such areas (Dudley 2008:14).

### Category II: National Park

Category II National Parks are large areas where natural ecological processes, including evolutionary processes with less human interference, may continue. They help conserve superlative natural scenery, diverse landscapes, rich geoheritage, biodiversity including key species, ecosystem services and rich cultural heritage, and they may form a core area for larger connectivity conservation initiatives. They may be internationally famous for their scenic grandeur, their remarkable natural phenomena and exceptional wildlife species and often include a range of visitor services and support facilities.

#### Definition

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities (Dudley 2008:16).

#### Primary objective

The primary objective of a Category II protected area is to protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation (Dudley 2008:16).



### Category III: Natural Monument or Feature

Category III protected areas are typically small and are focused on a natural feature or features and their associated ecosystems. They could include features such as cliffs, waterfalls, caves or forest groves, and may also be of importance as cultural sites including sacred natural sites. Visitor use of the site may be encouraged.

#### Definition

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, seamount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value (Dudley 2008:17).

#### Primary objective

The primary objective of a Category III protected area is to protect specific outstanding natural features and their associated biodiversity and habitats (Dudley 2008:17).

### Category IV: Habitat/Species Management Area

Category IV protected areas help to protect fauna and flora species that are usually of international, national or local importance and they help to protect key habitats. They may be small, but the size of these areas varies. They may include only fragments of an ecosystem, which may require regular and active management to sustain and perhaps more than implemented for Category I and II protected areas.

#### Definition

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. (Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category [Dudley 2008:19].)

#### Primary objective

The primary objectives of a Category IV protected area are to maintain, conserve and restore species and habitats (Dudley 2008:19).

### Category V: Protected Landscape/Seascape

Category V protected areas are landscapes/seascapes of distinctive scenic quality and include important flora and fauna habitats and cultural features. They ideally

feature a balanced interaction between humans and nature and provide opportunities for the restoration of nature and the maintenance of place-dependent cultural activities. They play an important role at a landscape or seascape scale and may contribute to conservation as part of a mosaic of conservation land or sea use that could include other protected area categories and connectivity conservation areas.

#### Definition

The Category V protected landscape/seascape is a protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic values, and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values (Dudley 2008:20).

#### Primary objective

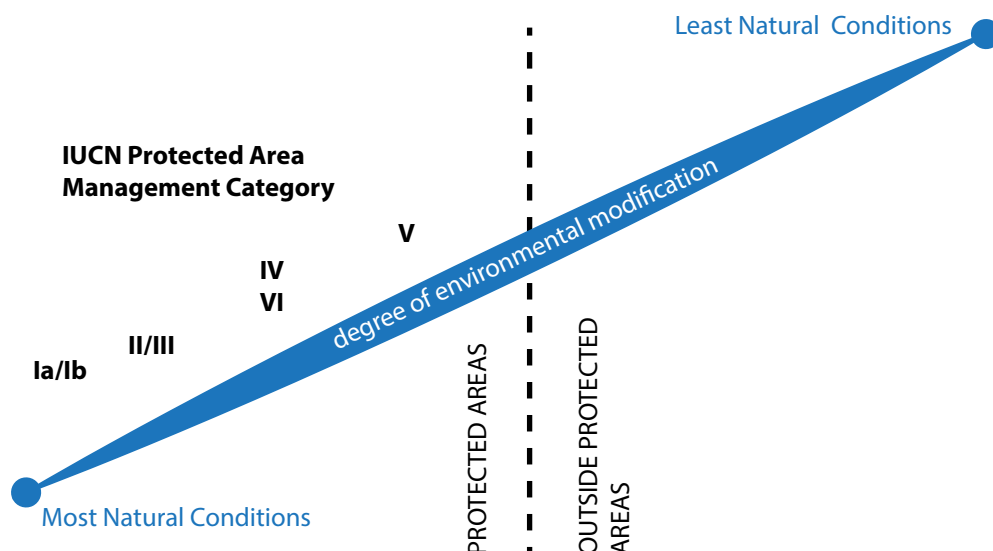
The primary objectives of a Category V protected area are to protect and sustain important landscapes/seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices (Dudley 2008:20).

### Category VI: Protected Area with Sustainable Use of Natural Resources

Category VI protected areas may be large areas and may be part of conservation initiatives such as large connectivity conservation areas. They are areas where the sustainable use of natural resources is a means to help achieve nature conservation together with protection objectives. This category does not accommodate large-scale industrial harvesting and it is recommended by the IUCN that a proportion (such as 66 per cent) of the area is retained in a natural condition.

#### Definition

Category VI protected areas conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area (Dudley 2008:22).



**Figure 2.1 Naturalness and IUCN protected area categories**

Source: Adapted from Dudley (2008:24)

### Primary objective

The primary objectives of a Category VI protected area are to protect natural ecosystems and use natural resources sustainably when conservation and sustainable use can be mutually beneficial (Dudley 2008:22).

## The six categories

The six categories are not designed as a hierarchical suite of categories in terms of quality, importance or naturalness; rather, their application is situational and is based on maximising nature conservation for a particular landscape/seascape context (Dudley 2008:24). The application of the IUCN categories in the context of 'naturalness' is illustrated in Figure 2.1.

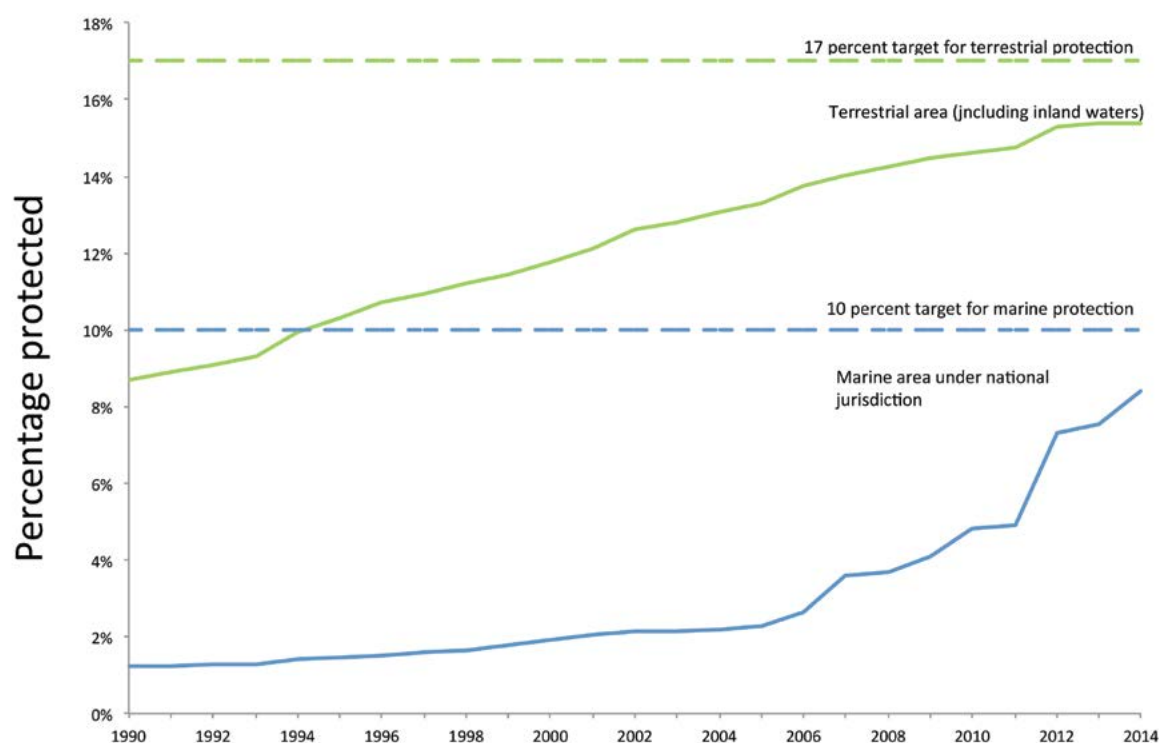
## Systems of protected areas

Systems of protected areas are where a number of protected areas have been established by a nation, sub-national governments, NGOs or other private organisations. In national protected area systems, the diversity of landforms, ecosystems, fauna and flora as found in each nation is ideally conserved through a conservation sampling within a number of carefully selected protected areas. Such a national system of protected areas aims to maximise the *in situ* conservation of a nation's natural heritage and ideally has five key elements that underpin the system (Davey 1998; Dudley 2008). Protected areas as a system need to also demonstrate the principles of good governance (Chapter 7), and a protected area system may include

a diversity of governance types such as government managed, co-managed, indigenous peoples' and community conserved territories and areas, and private protected areas. The five key elements that characterise a protected area system are as follows (Davey 1998).

1. Representative, comprehensive and balanced: There are high-quality examples of the full range of environment types within a country and the protected areas in the system provide a balanced sample.
2. Adequate: Each protected area has integrity (it is in good condition) and there is sufficiency of spatial extent and arrangement of contributing units to ensure the viability of species and ecological processes.
3. Coherent and complementary: There is a positive contribution of each protected area in the system towards the conservation and sustainable development objectives of a nation.
4. Consistent: There is consistency in approach to achieving management objectives for the entire system.
5. Cost effective, efficient and equitable: There is balance between costs and benefits and equity in the distribution of financial resources within the system and there is efficiency with the system (the minimum number and size of protected areas have been established to achieve system objectives).





**Figure 2.2** Growth in the percentage of terrestrial and marine area covered by protected areas, 1990–2014. The years are extracted from the protected area status year reported to the World Database on Protected Areas (WDPA). Protected areas with no reported status year were included in the 1990 baseline. Global statistics from the WDPA, August 2014

Source: UNEP-WCMC Cambridge

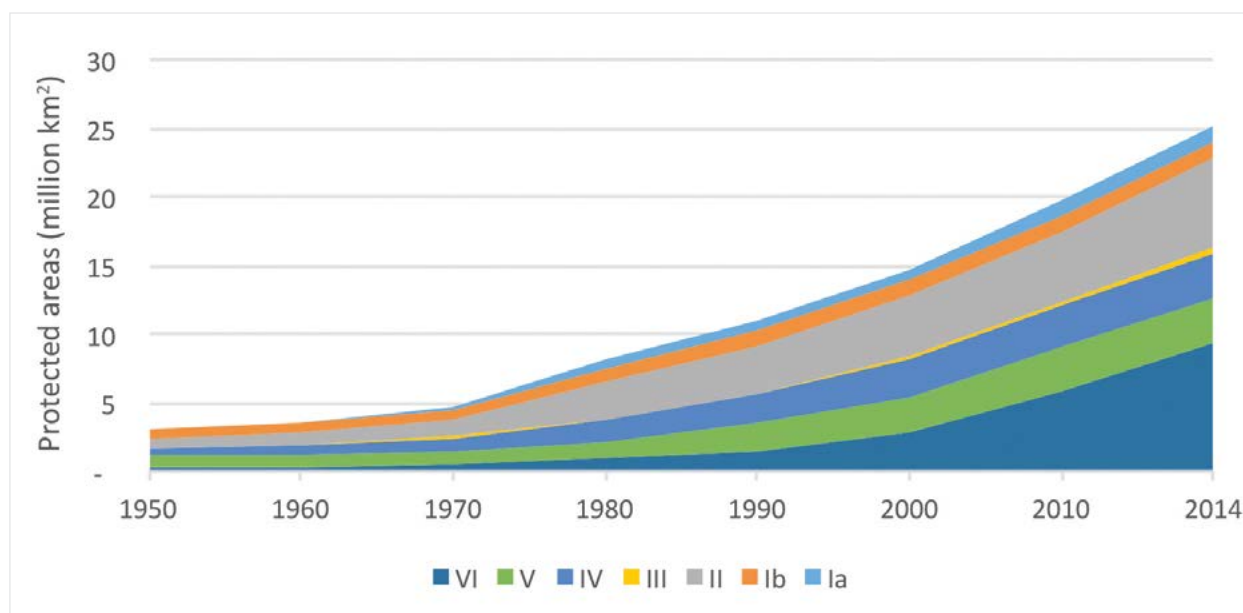
## Status of protected area coverage

In 1962, at the first World Conference on National Parks in Seattle, Washington, there were just 9214 protected areas identified for the world (Chape et al. 2003), and just 52 years later, in 2014, there were over 209,000 designated protected areas (IUCN and UNEP-WCMC 2014). This 20th and 21st-century transformation has meant that by 2014, some 15.4 per cent of the world's terrestrial and inland waters were protected, as were 3.4 per cent of the total marine area, including 8.4 per cent of marine areas under national jurisdiction and 8.0 per cent of national exclusive economic zones (IUCN and UNEP-WCMC 2014). It has been a remarkable achievement. It is one of the greatest peaceful land-use and sea-use transformations in human history (Figure 2.2), though this work is unfinished.

The data and protected area statistics described have been compiled in the World Data Base on Protected Areas (WDPA) that is managed by UNEP's World Conservation Monitoring Centre in Cambridge and includes protected areas of all IUCN governance types. In addition to government protected areas it includes hundreds of community-managed, co-managed and

private protected areas (including vast areas in Brazil and Australia). However, it is not complete, as the majority of such non-government protected areas are not formally recognised or reported by governments for various reasons. An indicative appraisal of the larger (non-recorded) extent of Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs) has been completed (Kothari et al. 2012). The number of ICCAs may have equalled or exceeded the number and extent of WDPA recognised protected areas.

Protected areas are recognised as an effective tool for conserving biodiversity and specifically many endangered species at a time of global change (Butchart et al. 2012). This is at a time when the sixth great extinction event on Earth is forecast, caused primarily by human activity (UNEP 2007). The aspirational target for 2020 reservation for nations established by the Convention on Biological Diversity's strategic plan 2011–20 (CBD 2011) is 17 per cent for their terrestrial area and 10 per cent for marine areas. The target calls on the areas to be important for biodiversity conservation such as key biodiversity areas (see Chapter 3). All IUCN protected area categories are important for biodiversity conservation, although some key biodiversity areas may need special protection to ensure species remain extant. Such management may



**Figure 2.3** Total areal extent (km<sup>2</sup>) of protected areas in the WDPA in each of the IUCN management categories, 1950–2014. The overall protected area in all categories is inflated due to overlaps of protected areas within and across categories. The graph includes undated protected areas with category information in all years and excludes protected areas with no category information.

Source: WDPA August 2014

be best established under the objectives and management guidance for Category I–IV protected areas (Figure 2.3), although Categories V and VI also play a valuable role in contributing to such biodiversity conservation.

## Other international protected area and conservation types

### World Heritage properties

In 1972, adoption of the World Heritage Convention (UNESCO 2013a) by the United Nations established the World Heritage List and provided an opportunity to recognise the most exceptional natural and cultural heritage places of Earth. This is a prestigious list, and in 2012 there were 190 parties who had ratified the convention (UNESCO 2013b), meaning it was almost universally adopted.

The convention recognises that World Heritage-listed natural and cultural heritage are irreplaceable assets of outstanding universal value not only for each nation but also for humanity as a whole (UNESCO 2011). The convention aims for the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage of ‘outstanding universal value’ (OUV) (UNESCO 2011). For ‘cultural heritage’, the convention recognises

monuments, groups of buildings and sites that feature the works of people or the combined works of nature and people (UNESCO 2011). The World Heritage ‘natural heritage’ criteria include natural aesthetic landscape features, geological and physiographic formations, significant ecosystems and ecosystem processes, species and precisely defined natural areas of OUV (UNESCO 2011). The convention also recognises ‘mixed cultural and natural heritage properties’ and ‘cultural landscapes’.

There is a rigorous process for achieving inscription on the World Heritage List that includes assessments against the OUV criteria, an evaluation of integrity/ and or authenticity and a review of the protection and management of the property. If World Heritage status is achieved, as part of the convention, there is a requirement for each state party to maintain the World Heritage OUV and to provide periodic reports on the condition and trend in condition of the OUV. World Heritage properties may be designated over any land tenure, however, there is a requirement that the OUV is conserved. Usually World Heritage properties are inscribed over lands coincident with established protected areas, especially given the need for an effective management regime. World Heritage sites around the world are therefore special and ideally represent the ‘best of the best’ of Earth’s natural and cultural heritage. Chapter 3 provides further information about natural World Heritage properties recognised by the World Heritage Convention.





**Banff National Park World Heritage Property, Canada**

Source: Graeme L. Worboys

## Ramsar Wetlands

Wetlands of importance may be officially recognised under the provisions of the Ramsar Convention. This treaty was adopted in 1971 in the city of Ramsar, Iran, and in 2013 there were 168 contracting parties to the convention and 2168 recognised sites around the world (Ramsar 2013). The convention uses a broad definition of the types of wetlands covered by its mission including lakes and rivers; swamps and marshes; wet grasslands and peatlands; oases; estuaries; deltas and tidal flats; near-shore marine areas; mangroves and coral reefs; and human-made sites such as fish ponds, rice paddies, reservoirs and salt pans. The convention's mission is 'the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world' (Ramsar 2013:1). The parties commit to undertaking an inventory of their wetlands and preparing a strategic framework for the Ramsar list. This includes establishing systematic and representative national designation and management of wetland habitat types. There is no obligation for Ramsar sites to

be legally protected, though listing status does enhance protection (Dudley 2008). Chapter 19 of this book deals further with areas recognised by the Ramsar Convention.

## UNESCO Man and the Biosphere Programme (biosphere reserves)

Biosphere reserves are part of the Man and the Biosphere (MAB) Programme. It was launched by the UN Educational, Scientific and Cultural Organisation (UNESCO) in 1971 as an intergovernmental scientific program that aims to set a scientific basis for the improvement of the relationships between people and their environment globally (UNESCO 2013c). In 2013, the World Network of Biosphere Reserves included 621 reserves in 117 countries (UNESCO 2013c). The MAB Programme combines natural and social sciences, economics and education to improve human livelihoods and safeguard natural ecosystems, and thus aims to promote innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable.

Biosphere reserves aim to achieve the integrated management of land, fresh water, marine waters and living resources by establishing bioregional planning schemes (and zones) to achieve sustainable development. Implementation of the zones is left to the discretion of nations, and they include core zones (ideally protected areas) that are surrounded by buffer zones (where conservation is emphasised) and a transition zone (or area of cooperation that promotes sustainable development) (UNESCO 2002). Biosphere reserves are described on their nomination form by UNESCO (2013b:1):

Biosphere reserves are areas of terrestrial and coastal/marine ecosystems, or a combination thereof, which are internationally recognized within the framework of UNESCO's Programme on Man and the Biosphere (MAB). They are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere reserves are designated by the International Coordinating Council of the MAB Programme at the request of the State concerned. Individual biosphere reserves remain under the sovereign jurisdiction of the State where they are situated. Collectively, all biosphere reserves form a World Network in which participation by States is voluntary.

The World Network of Biosphere Reserves is governed by a framework adopted by the UNESCO General Conference in 1995, which presents the definition, objectives, criteria and designation procedure for biosphere reserves. The actions recommended for the implementation of biosphere reserves are set out in a document referred to as the ‘Seville Strategy’, and this was further developed as the ‘Madrid Action Plan’ (2008–13) (UNESCO 2013d). Requirements for areas to be recognised as a biosphere reserve are given in Box 2.1.

## UNESCO Geoparks

The concept of geoparks evolved as a basis for protecting areas of special geological features. UNESCO adopted the concept in 2001, and provided the following guidance:

A Global Geopark is a unified area with geological heritage of international significance. Geoparks use that heritage to promote awareness of key issues facing society in the context of the dynamic planet we all live on. Many Geoparks promote awareness of geological hazards, including volcanoes, earthquakes and tsunamis and many help prepare disaster mitigation strategies among local communities. Geoparks hold records of past climate change and are educators on current climate change as well as adopting a best practice approach to utilising renewable energy and employing the best standards of green tourism. (UNESCO 2014:1)

Geoparks provide information about the sustainable use of and need for natural resources, whether they are mined, quarried or harnessed from the surrounding environment, while at the same time promoting respect for the environment and the integrity of the landscape. Geoparks are not a legislative designation, though the key geoheritage sites within a geopark should be protected under the appropriate legislation (UNESCO 2013e). The Global Network of National Geoparks is a voluntary network supported by UNESCO whose members are committed to work together and exchange ideas of best practice and join in common projects (UNESCO 2013e). Chapter 18 of this book deals further with UNESCO geoparks.

## Introducing non-government protected areas

‘Conventional’ protected areas are commonly thought of as protected areas established and managed by national governments, especially given the commitment of these governments to the Convention on Biological Diversity and to the implementation of the CBD strategic plan 2011–20. Sub-national governments also establish protected areas. In addition to these government protected areas, around the world in the 21st century, there has been greater recognition of the traditional and continuing role of indigenous peoples and local communities, and of individuals, civil society organisations and the private sector in the conservation of land, including the governance and management of protected areas.

Innovation in conservation, protection and management has been called for (Figgis 2012) at a time when a cocktail of threats such as increased human pressures including habitat destruction and poaching, pollution and climate change, severe weather events and fires, and introduced species are impacting the Earth’s biodiversity. Two types of non-government protected areas are recognised widely, including by the IUCN and by governments as part of the CBD Programme of Work on Protected Areas: Indigenous Peoples’ and Community Conserved Territories and Areas (ICCAs) and Private Protected Areas (PPAs). A third type, Shared Governance or Collaboratively Managed Protected Areas, contains sites managed by two or more of these agencies and groups. Together with government-protected areas, these constitute the four governance types now globally recognised (see Chapter 7).

## Indigenous Peoples and Community Conserved Territories and Areas

Outside formal tribal governments such as those in the United States, indigenous peoples and local and mobile communities may establish, govern and manage ICCAs (Borrini-Feyerabend et al. 2004). ICCAs provide an important contribution to biodiversity conservation in many parts of the world. They have been defined as ‘natural and modified ecosystems with significant biodiversity, ecological and related cultural values, voluntarily conserved by indigenous peoples and local communities through customary laws or other effective means’ (Kothari et al. 2012:16).





## Rio Platano Biosphere Reserve, Honduras

Source: Eduard Müller

### Box 2.1 UNESCO criteria for designation as biosphere reserve

Article 4 of the biosphere reserve framework presents seven general criteria for an area to be qualified for designation as a biosphere reserve. It would:

1. Encompass a mosaic of ecological systems representative of major biogeographic region(s), including a gradation of human interventions.
2. Be of significance for biological diversity conservation.
3. Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.
4. Have an appropriate size to serve the three functions of biosphere reserves.
5. Through appropriate zonation, achieve
  - a. a legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives
  - b. a buffer zone or zones clearly identified and surrounding or contiguous with the core area or areas, where only activities compatible with the conservation objectives can take place
  - c. an outer transition area where sustainable resource management practices are promoted and developed.
6. Have organisational arrangements that provide for the involvement and participation of a suitable range of *inter alia* public authorities, local communities and private interests in the design and carrying out of the functions of a biosphere reserve.
7. Have mechanisms for implementation that include
  - a. mechanisms to manage human use and activities in the buffer zone or zones
  - b. a management policy or plan for the area as a biosphere reserve
  - c. a designated authority or mechanism to implement this policy or plan
  - d. programs for research, monitoring, education and training?

Source: UNESCO (2013b)

This encompasses three essential features (Kothari et al. 2012:17).

1. A well-defined people or community with a close and profound relation with an equally well-defined site (a territory, area or species habitat, though the boundaries may be flexible) and/or species; this is a relation rooted in culture, sense of identity and/or dependence for livelihood or wellbeing.
2. The people or community as the major player in decision-making and implementation regarding the governance and management of the site and/or species, implying local institutions have the *de facto* and/or the *de jure* (formal equality) capacity to develop and enforce decisions. Other rights-holders and stakeholders may collaborate as partners—especially when the land is owned by the state—but local decisions and management efforts are predominant.
3. The people's or community's management decisions and efforts lead to the conservation of habitats, species, genetic diversity, ecological functions/benefits and associated cultural values, even when the conscious objectives of management are not conservation alone.

There are many different types of ICCAs (Box 2.2). Not all of these ICCAs are protected areas, but all of them help to conserve biodiversity and include many values and benefits (Box 2.3). ICCAs may be very small or extend over several million hectares, and are found in many countries of the world. Neema Pathak (Case Study 2.1) has researched details of their characteristics in India. Chapter 7 provides further information on ICCAs.

### Australian Indigenous Protected Areas

The Australian Government has supported the development of Indigenous Protected Areas (IPAs) since 1997 and has defined these as 'an area of Indigenous-owned land or sea where traditional owners have entered into an agreement with the Australian Government to promote biodiversity and cultural resource conservation' (Government of Australia 2013:1).

IPAs do not have an overarching legal framework; rather they rely on Indigenous communities identifying their wish to dedicate their land for conservation purposes. IPAs are formally recognised as a protected area under Australia's National Reserve System through the 'legal and other effective means' clause of the IUCN protected area definition (Rose 2013). In 2013, there were 60 declared IPAs covering just more than 48 million hectares across Australia, contributing more than one-third of the National Reserve System (Government of Australia

2013). IPAs deliver more than environmental benefits; importantly, they provide communities with significant health, education, economic and social benefits as well as protecting their significant cultural values.

### Private protected areas

Privately owned and managed protected areas have been in existence for centuries (such as the private hunting reserves of Mongolia and Europe) (Langholz 2005). Privately protected areas are now being encouraged by some nations as a mechanism for biodiversity conservation that complements community-based and government reserves. The IUCN defined a private protected area at the 2003 IUCN World Parks Congress as 'a land parcel of any size that is 1) predominantly managed for biodiversity conservation; 2) protected with or without formal government recognition; and 3) is owned or otherwise secured by individuals, communities, corporations or non-governmental organisations' (Chape et al. 2008:102).

Private protected areas have been established, for example, in Chile (Pumalin Park), southern and eastern Africa (such as the game reserves that adjoin Kruger National Park), Namibia (Namib Rand Nature Reserve), the United States (the Gray Ranch) and the United Kingdom (the Royal Society for the Protection of Birds with its 150 reserves totalling more than 240 000 hectares) (Langholz 2005). In Australia several NGOs have purchased substantial properties and manage them for biodiversity outcomes, including Bush Heritage Australia, the Australian Wildlife Conservancy and Tasmanian Land Conservancy. Also notable are The Nature Conservancy preserves and easement lands in the United States, which currently protect approximately 6.1 million hectares (TNC 2013).

### Other conservation initiatives that complement protected areas

There are many initiatives and effective area-based conservation measures that do not meet the definition of a protected area or where protected area status is not sought, but still contribute to biodiversity conservation outcomes. These include voluntary wildlife sanctuaries, roadside greenways, conserved riparian areas in production forests, conservation areas in government-owned forests, wetlands and forested areas retained on farmland, along streams, tourist areas, private ecotourism destinations, ICCAs outside the protected area system, military areas and even university campuses. Regenerating former agricultural areas, urban parks, public gardens and private estates and gardens (especially with native species) can all contribute to conservation of native biodiversity in the landscape.

## Case Study 2.1 Community Conserved Areas in India

Neema Pathak, in her contribution to our knowledge of community conserved areas (CCAs) in India, acknowledged the enormous challenge of defining CCAs for her country. She established a working definition, which identified CCAs as '[n]atural ecosystems (forest/marine/wetlands/grasslands/others), including those with minimum to substantial human influence, containing significant wildlife and biodiversity value, being conserved by communities for cultural, religious, livelihood, or political purposes, using customary law or other effective means' (Pathak 2009:49).

She also identified six criteria for recognising CCAs for India.

1. There is an identified group of people who can be considered a community who are involved in the effort.
2. The concerned communities have substantial ethical, livelihood, cultural, economic or spiritual associations with and dependence on the conserved area.

3. The concerned communities are the major players or among the major players in decision-making and implementation of decisions.
4. The concerned communities have established systems (institutions, regulations, processes) for achieving their objectives.
5. Irrespective of the objective of the initiative, the efforts lead to maintenance or enhancement of one or more natural ecosystems and species therein.
6. The effort is taking place within a locally identified boundary (Pathak 2009:50–1).

Source: Pathak (2009)

### Box 2.2 Types of ICCAs

There are several kinds of ICCAs and they are listed here. Not all of these ICCAs are protected areas, but they do help to conserve biodiversity (see Chapter 7).

- Indigenous peoples' territories governed and managed as part of their history and life, encompassing sustainable use, cultural values and/or, in more recent times, explicit conservation objectives. For example, indigenous territories with multiple villages in Suriname, Indigenous Protected Areas in Australia, indigenous reserves in Costa Rica and indigenous 'Comarcas' in Panama.
- Territories (terrestrial or marine) over which mobile or nomadic communities have traditionally roamed, managing the resources through customary regulations and practices—for example, customary rangelands of tribal confederacies in Iran, and pastoral landscapes in Kenya and Ethiopia.
- Sacred natural sites or spaces, ranging from tiny groves and wetlands to entire landscapes and seascapes, often (but not necessarily) left completely or largely inviolate. For example, sacred groves and landscapes of South Asia, sacred lakes and marine burial sites in the Philippines and sacred forests of Kenya.
- Resource catchment areas, from which communities make their essential livelihoods or from which key ecosystem benefits are derived, managed in such a way that these benefits are sustained over time. For example, locally managed marine areas in the South Pacific and Madagascar, autonomous marine protected areas and Satoumi seascapes in Japan, marine areas for responsible fishing in Costa Rica, and community forests in Tanzania.
- Areas conserved for optimising productivity of related ecosystems—for example, 'fisher forests' or 'fish-breeding forests' in Japan.
- Areas and species populations sustainably managed for commercial benefits—for example, sites managed for ecotourism in Suriname and Kenya and areas managed for sustainable hunting and ecotourism like Namibia's Communal Conservancies.
- Nesting or roosting sites, other critical habitats of wild plants and animals, or wildlife populations spread over large territories, conserved for ethical or other reasons explicitly oriented towards protecting these plants and animals. For example, bird nesting and roosting sites in India, sacred crocodile ponds of Gambia and Mali, certain tree species like arawone (*Tabebuia serratifolia*) in Suriname and marine turtle nesting sites in Chile, Costa Rica and Suriname.

Source: Kothari et al. (2012)



### Box 2.3 Values and benefits of ICCAs

ICCAs, many of which are formally recognised as protected areas, include important values and provide many benefits including:

- providing the context and means for the socio-cultural, economic, political, spiritual, and physical wellbeing of thousands of indigenous peoples and local communities, involving hundreds of millions of people
- helping to conserve critical ecosystems and threatened species across a broad range of biogeographic regions of the world
- maintaining essential ecosystem functions, such as water security, soil conservation and maintenance of gene pools
- providing connectivity conservation corridors and linkages for species movements including often between two or more protected areas
- providing secure and sustainable (though not necessarily adequate in all cases) livelihoods in a variety of occupations—both subsistence and revenue-generating—including forestry, fisheries, pastoralism, crafts, health, tourism and others
- helping to conserve a diversity of agricultural ecosystems, species/genes, and practices, as well as synergising links between agricultural biodiversity and wildlife and providing larger land and waterscape-level integration for conservation
- offering crucial lessons for participatory governance that are useful for providing guidance for every form of governance including government-managed protected areas
- offering lessons in integrating customary and statutory laws, and formal and non-formal institutions that aim to achieve effective conservation
- building on and validating sophisticated local ecological knowledge systems, elements of which have wider positive use

- aiding communities with resistance to destructive development and saving territories and habitats from mining, dams, logging, tourism, over-fishing, agricultural expansion by settler populations, and others
- helping communities in empowering themselves, especially to reclaim or securing territories, tenure and rights to or control over resources they depend on or relate to
- aiding communities to better define their territories, such as through mapping
- helping to create a greater sense of community identity and cohesiveness, and also a renewed vitality and sense of pride in local cultures including amongst youth who may otherwise be alienated through modern influences
- creating conditions for other developmental inputs to flow into the community such as funds for schools, health clinics, water connections and livelihood enterprises
- leading to greater equity within a community (e.g. between classes, men and women, and ethnic groups) and between the community and outside agencies (e.g. in decision-making)
- conserving biodiversity at relatively low financial cost (though often high labour inputs), with costs of management often covered as part of normal livelihood or cultural activities, through existing systems and structures
- providing examples of relatively simple and effective administration and decision-making structures, and avoiding complex bureaucracies.

Values and benefits of protected areas are discussed further in Chapter 6.

Source: Kothari et al. (2012)

The Aichi Target 11 of the CBD recognises that if the global goal of 17 per cent terrestrial and 10 per cent marine coverage of conservation is to be achieved, it will have to be through a combination of protected areas and ‘other effective area-based conservation measures’, such as the examples above.

## Challenges for protected areas

Protected area governance authorities and managers (Box 2.4) have enormous challenges in the 21st century. The footprint of human disturbance and change can be seen on every continent of Earth including Antarctica,

and transformation of natural environments has gained momentum, not diminished during this century. Assessments of the challenges facing protected areas made by Charles Barber and his colleagues in 2004 are essentially unchanged (Barber et al. 2004), though they are perhaps clearer in 2014, such as the increasingly entrenched effects of climate change (IPCC 2013) and population growth, which could see 9.2 billion people on Earth in 2050 (UNEP 2013). In this book we appraise such underlying causes of threats to protected areas (Chapter 16) and provide responses to the consequent challenges facing protected area governors and managers. Our aim is to equip protected area practitioners with the information they need to achieve effective management of their areas as a basis for creating improved futures



**Women's forest protection committee at Dangejheri village, Odisha, India**

Source: Ashish Kothari

for species, ecosystems and other heritage and for maintaining healthy environments and consequently healthy people on our planet. Here we briefly consider some significant challenges and introduce the book chapters that respond to these issues. These challenges below comprise facts, observations by many people and some personal reflections based on the author's 40 years of protected area professional management.

## Challenge: Global change

Global change is a major challenge for protected area governors and managers. In the 21st century they will need to deal with a shifting climate with its associated more frequent and more severe storm and weather systems; with sea-level rise and the inundation of islands, and estuarine and low-lying areas; and with the melting of many mountain glaciers and the transformation of

### Box 2.4 Governance and management

Governance is a critical part of protected areas that identifies how organisations administer a protected area and the associated power and decision-making arrangements. It addresses who makes decisions for protected areas and their management, and how the decisions are made. It is different from management that focuses on what responses are needed for a given situation or a location in need of attention. Governance is about how power is exercised, how decisions are taken on issues of public concern and how citizens or other stakeholders have their say (Graham et al. 2003). Global conservation policy has also recognised the importance of the quality of governance, including whether individual protected areas or the protected area system as a whole incorporate principles such as accountability, fairness, equity, participation, subsidiarity, effectiveness for achieving biodiversity conservation, and others. Chapter 7 discusses governance and protected areas in more detail.

Management is about the coordination of people, resources and activities to achieve the objectives of a protected area organisation (Hitt et al. 2011), and there are four basic functions that are undertaken in any process of management: planning, organising, leading and evaluating. Protected areas need active management for the conservation of biodiversity, other natural heritage and cultural heritage. If this management is not effective then a protected area may be reduced to being a 'paper park' with its heritage values lost. Chapter 8 of this book describes in more detail how protected areas are established and managed and Chapter 28 describes the concept of management effectiveness evaluation.

perennial streams to ephemeral streams (Chapter 17). These changes will see enhanced threats from droughts, flooding rains and incidents such as wildfire, and the effects of storm surges will be more frequent and require new skills and responses for protected area professionals (Chapter 26). These climate change trends will also witness shifts in areas suitable for vegetation types, changes in habitats and invasions of alien species that will require more strategic, more frequent and often larger and more sophisticated management responses (Chapter 16).

It will be a world of increasing human population and associated increasing demand for Earth's finite resources, enhanced industrialisation, globalised commerce, instant communication, and the resulting transformation and reduction in area of natural habitats and impacts on Earth's species (Barber et al. 2004). Increased tension and conflict are potentially major issues as human demands

and industries endeavour to access existing protected areas and threats from outside park boundaries impact on the health of the ecosystems and species. Pollution of the atmosphere, creeks, rivers, estuaries and oceans can be expected to increase and other threats such as habitat destruction and poaching can be expected to prevail given more people on Earth (Barber et al. 2004). Some issues may be amenable to global responses such as acceptance of a broadscale international ban on mining in protected areas (Categories I–V) in accordance with the 21st-century IUCN position. Other issues may be suitable for protected area system-level responses where governments, organisations and communities vigorously and faithfully uphold the IUCN protected area category objectives of management. Many issues, however, will need to be dealt with as they impact individual protected areas.

The pressures of some commerce, business sectors and agriculture on society to move substantially away from conservation and protection in favour of utilisation and development will increase. Forces advocating and facilitating the ‘regression’ and ‘back-sliding’ of protected areas for ‘use’ and for vested interests may grow as populations grow and as resources become scarce. In different parts of the world, the equivalent of the 1913 Hetch Hetchy Dam ‘utilisation versus conservation’ debate in Yosemite National Park in the United States could occur. In 1912, John Muir wrote:

Hetch Hetchy is a grand landscape garden, one of nature’s rarest and most precious mountain temples. As in Yosemite, the sublime rocks of its walls seem to glow with life ... while birds, bees, and butterflies help the river and waterfalls to stir all the air into music ... These temple destroyers, devotees of ravaging commercialism, seem to have a perfect contempt for Nature, and, instead of lifting their eyes to the God of the mountains, lift them to the Almighty Dollar. (Muir 1912)

Thankfully in the 21st century, people like Muir continue to inspire and seek to conserve protected areas for future generations. Part of this inspiration is the knowledge that if these areas are utilised and despoiled, there will be few (if any) remaining equivalent lands on finite Earth. Their intergenerational inheritance status, their long-term immense and sustainable contribution to ecosystem services, their purpose in protecting a nation’s species, their role in retaining healthy environments and their natural beauty are what is enjoyed so much by people (Chapter 6).

Leadership and effective governance and management of protected areas will need to anticipate and deal with ‘use’ advocacy pressures (Chapters 7, 8 and 12). The concept of protected areas as intergenerational or ‘forever protected’ lands will need to be deeply valued by all societies. It will need to be constantly championed. Protected area leaders (Chapter 12) will need to effectively communicate protection messages (Chapter 15), work positively with people and decision-makers (Chapter 14) and ensure that information about the importance and benefits of protected areas is readily available (Chapter 11). Dealing with the larger issue of the sustainable use of Earth’s finite resources will be a critical part of helping to protect the natural values of protected areas in the long term (Chapter 8).

## Challenge: Establishing new protected areas

Protected area governors and managers have the comfort and knowledge that well-managed protected areas are effective in their role of protecting individual species, biodiversity and ecosystem services and other natural and cultural heritage. In 2014, however, there is inadequate coverage of protected areas on Earth. Only 15.4 per cent of the Earth’s terrestrial area (outside Antarctica) and 3.4 per cent of its marine environment are under officially recognised protected areas (IUCN and UNEP-WCMC 2014), and this is not enough to adequately conserve Earth’s species. This challenge was identified by the Convention on Biological Diversity strategic plan 2011–20 and especially Target 11:

By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes. (CBD 2011:3)

Consequently, nations of Earth have agreed that additional protected areas need to be established, and recognition provided to currently unrecognised conservation initiatives by communities and the private sector to fill gaps. Establishing exactly where new protected areas are needed is critical, and a gap analysis supported by systematic conservation planning approaches is often used to achieve this (Chapter 13). In





### Great Himalayan National Park, India

Source: Graeme L. Worboys

2014, more sophisticated data aggregation approaches are also being used to identify key biodiversity areas (Chapter 21).

The introductory descriptions of the Earth's major environment types (Chapter 3) underpin more detailed identification of terrestrial areas that represent important biodiversity areas and potential gaps of biodiversity conservation significance (Chapters 3 and 21; Butchart et al. 2012). Consideration of cultural heritage (Chapter 4), geoheritage (Chapter 18), freshwater and estuarine environments (Chapter 19) and marine environments (Chapter 20) helps identify the importance of conserving natural and cultural heritage. Establishing the locations, purposes and management objectives is an important part of the reservation process, and the six universally accepted IUCN categories described above provide essential guidance in this regard. Visionary leadership is also a key part of establishing new protected areas (Chapter 12), as is a clear understanding of the social and political contexts and societal influences and global change (Chapter 5).

## Challenge: Effective governance and management

The practice of protected area governance and management is an essential profession for facilitating a healthy environment and for helping to conserve life on Earth. Ideally it is underpinned by both formal tertiary-level protected area governance and management qualifications and vocation-based training (Chapter 9), and achieving this standard is a global challenge. Local traditional knowledge held by indigenous communities also provides a critical contribution to conservation management (Chapters 7 and 25).

Achieving effective governance for protected areas is vital (Chapter 7). Organisations and communities will need to be adaptive and responsive to changes, and local professional protected area managers will need to have the freedom to manage (Chapter 8), albeit within established statutory, corporate and planned guidelines, as well as with community input and guidance. The imposition of directives from centralised power bases, for example, which disempowers the ability of 'managers to manage' and otherwise protect nature, is poor governance practice and a threat to nature conservation.

In addition to staff with the right competencies and training, effective management is based on good planning (Chapter 13), good business management, a sound knowledge of managing biodiversity conservation needs (Chapter 21), the ability to manage for cultural heritage management requirements (Chapter 22), resource use (Chapter 25) and operations management (Chapter 24), as well as looking after the needs of visitors (Chapter 23). This important work may extend to managing World Heritage properties (Chapter 3) or working off-reserve or conservation area to help facilitate connectivity conservation areas (Chapter 27). Evaluating the effectiveness of all of this professional management activity and reporting on the good work are fundamental for the future (Chapter 28). Achieving a minimum professional standard of protected area governance and management for all protected areas on Earth provides a fundamental contribution to the conservation of life on Earth. It is a formidable challenge in the early part of the 21st century, with this book providing one response to this challenge.

## Challenge: The future

Protected areas provide a key response to many of the environmental issues facing all nations of Earth in the coming decades and in particular climate change, water stress, food security, energy production and biodiversity

loss (MacKinnon et al. 2011). They have a formidable responsibility, for protected areas are the principal tools for conserving Earth's diversity of life and for protecting a wealth of natural and cultural heritage on behalf of nations. The concept of protected areas has been implemented with confidence by governments and others since the 20th century, and science has confirmed that effectively managed protected areas have been successful in conserving biodiversity. As we progress further and further into the 21st century, with its associated human population increases, development and consumption, deepening impacts of climate change, post-peak oil energy changes, resource shortages and potential social disorder, there will be increasing challenges for protected areas and their managers. The actions in the 20th and early 21st centuries to reserve and establish protected areas, though formidably tough to achieve, will in retrospect be seen as the easy (though essential) part of the history of governing and managing for protected areas.

In the future, protected areas may well be among the last natural lands. If so, they would be a focus of attention. They would be the only places where certain resources were available and where the last of some species continued to exist in the wild. Knowing human behaviour, one inevitable threat would be in the form of the seemingly irresistible forces that seek to access and utilise (either legally or illegally) the last of these resources, despite the consequences. The illegal shooting of rhinoceros for their horns in Kruger National Park, South Africa, in 2013 to meet the demand from Asian medicine markets (irrespective of the decline in rhinoceros population numbers) is one example of such a potential future. Mining is another formidable threat. It is currently one of the severest threats to protected areas and even to World Heritage sites, for income from mining royalties is hard for economically struggling economies to resist.

We need to be optimistic that planet Earth and its peoples will never allow a situation where short-term resource gains have precedence over lands and seas protected for their outstanding values for all generations. We need to invest in a healthy planet where the diversity of life can continue, and where the natural inheritance of future generations is held in trust and effectively managed. There is no doubt, however, that protected area managers will be challenged more and more in the future. These challenges will come from many environmental threats as well as the social and political contexts in which protected areas operate. This book has been designed to help equip 21st-century protected area managers to deal with such issues and to provide the type

of leadership necessary to help secure protected areas as long-term treasured assets of the community that are 'too precious to lose'.

## Conclusion

The 20th century and the first part of the 21st century have witnessed one of the great peaceful land-use and sea-use transformations in human history with the establishment of protected areas by nearly all nations of Earth, although this action is unfinished and ongoing. In 2014, protected areas covered 15.4 per cent of the terrestrial area of Earth, 3.4 per cent of the sea and 8.4 per cent of seas under national jurisdiction (IUCN and UNEP-WCMC 2014). The urgency of protected area establishment is one critical response to today's challenges and those of the future, including threats from habitat loss and climate change.

The Convention on Biological Diversity's 'Strategic Plan for Biodiversity 2011–20' (CBD 2011) challenges nations to achieve protected area (and other effective area-based conservation area) targets of at least 17% for terrestrial areas and 10% for marine areas by 2020. This reflects great confidence in the concept of protected areas as a critical conservation tool. Such confidence is based on lived experience and demonstrated conservation successes. It is also confidence achieved through the clarity of purpose for protected areas that is underpinned by robust supporting information. Protected areas are clearly defined; the different management types are formally recognised including six IUCN management categories; their different governance types are formally described; and the principles of their management are clearly articulated. Protected areas are also effective thanks to planned, active and competent management implemented by trained practitioners. Protected areas help conserve biodiversity and other natural heritage and cultural heritage and they are an intergenerational investment in a better world.

## Supplementary reading

The IUCN has produced a suite of important guidelines and other protected area governance and management literature, many of which are listed in Appendix 2.1.





Cape Point, Cape of Good Hope section, Table Mountain National Park, South Africa: the park includes Cape Flora vegetation communities, one of the world's richest temperate flora that includes fynbos (shrubland that is dominated by fine-leaved shrubs). The park is part of the Cape Floral Region Serial World Heritage Property.

Source: Graeme L. Worboys



The boardwalk shown provides visitor access through rich mangrove communities within the Celestun Biosphere Reserve, Yucatan State, Mexico: the fresh water cenotes, mangrove and estuarine habitats of the reserve help to protect flocks of flamingos (*Phoenicopterus* sp.) and herons; it is an important resting and breeding site for migratory birds and it is a hatching ground for turtle species.

Source: Graeme L. Worboys



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## Appendix 2.1

### Key IUCN WCPA and related publications

Please note: While every effort has been made in the research time available to identify key sources, this list is not complete.

Year	Title	Reference
<b>1973–82</b>		
1976	<i>Parks Magazine</i> launched (produced volumes for a while)	Various
1980	<i>World Conservation Strategy: Living resource conservation for sustainable development</i>	IUCN et al. (1980)
<b>1983–92</b>		
1986	<i>Managing Protected Areas in the Tropics</i>	Mackinnon et al. (1986)
1990	<i>Parks on the Borderline: Experience in transfrontier conservation</i>	Thorsell (1990)
1991	The journal <i>Parks</i> recommenced (volumes produced until 2008, and then recommenced in 2012)	Various
1991	<i>Caring for the Earth</i>	IUCN et al. (1991)
1992	<i>Global Biodiversity Strategy</i>	WRI et al. (1992)
1992	<i>Protected Areas of the World: A review of national systems</i> (four volumes)	UNEP-WCMC and IUCN (1991)
1992	<i>Guidelines for Establishing Marine Protected Areas</i>	Kelleher and Kenchington (1992)
1992	<i>Guidelines for Mountain Protected Areas</i>	Poore (1992)
<b>1992–2003</b>		
1993	<i>Parks, Peaks and People: A collection of papers arising from an international consultation on protected areas in mountain environments held in Hawaii Volcanoes National Park 26 October – 2 November 1991</i>	Hamilton et al. (1993)
1994	<i>Guidelines for Protected Area Management Categories</i>	IUCN (1994a)
1994	<i>Parks for Life: Action for protected areas in Europe</i>	IUCN (1994b)
1995	<i>African Heritage 2000</i>	IUCN (1995)
1996	<i>Transborder Protected Area Co-Operation</i>	Hamilton, et al. (1996)
1996	<i>Tourism, Ecotourism and Protected Areas</i>	Ceballos-Lascuráin (1996)
1997	<i>Guidelines for Cave and Karst Protection</i>	Watson et al. (1997)
1998	<i>National System Planning for Protected Areas: Best practice guideline</i> (No. 1)	Davey (1998)
1998	<i>Economic Values of Protected Areas: Guidelines for protected area managers</i> (No. 2)	WCPA (1998)
1999	<i>The Green Web: A union for world conservation</i>	Holdgate (1999)
1999	<i>Guidelines for Marine Protected Areas</i> (No. 3)	Kelleher (1999)
1999	<i>Guidelines for Public Use Measurement and Reporting at Parks and Protected Areas</i>	Hornback and Eagles (1999)
1999	<i>Linkages in the Landscape: The role of corridors and connectivity in wildlife conservation</i>	Bennett (2003)
2000	<i>Indigenous and Traditional Peoples and Protected Areas: Principles, guidelines and case studies</i> (No. 4)	Beltrán (2000)
2000	<i>Financing Protected Areas: Guidelines for protected area managers</i> (No. 5)	WCPA (2000)
2000	<i>Evaluating Effectiveness: A framework for assessing the management of protected areas</i> (No. 6)	Hockings et al. (2000)
2001	<i>Protected Area Management: Principles and practice</i>	Worboys et al. (2001)

Year	Title	Reference
2001	<i>Transboundary Protected Areas for Peace and Co-Operation</i> (No. 7)	Sandwith et al. (2001)
2002	<i>Sustainable Tourism in Protected Areas: Guidelines for planning and management</i> (No. 8)	Eagles et al. (2002)
2002	<i>Management Guidelines for Category V Protected Areas: Protected landscapes/seascapes</i> (No. 9)	Phillips (2002)
2003	<i>Guidelines for Management Planning of Protected Areas</i> (No. 10)	Thomas and Middleton (2003)
2003	<i>The Full Value of Parks: From economics to the intangible</i>	Harmon and Putney (2003)
<b>2003–14</b>		
2004	<i>Integrating Biodiversity Conservation and Sustainable Use: Lessons learned from ecological networks</i>	Bennett (2004)
2004	<i>Indigenous and Local Communities and Protected Areas: Towards equity and enhanced conservation</i> (No. 11)	Borrini-Feyerabend et al. (2004)
2004	<i>Speaking a Common Language: The uses and performance of management categories for protected areas</i>	Bishop et al. (2004)
2004	<i>Guidelines for Planning and Managing Mountain Protected Areas</i>	Hamilton and McMillan (2004)
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2004	<i>Securing Protected Areas in the Face of Global Change: Issues and strategies</i>	Barber et al. (2004)
2005	<i>Protected Area Management: Principles and practice</i> (2nd edn)	Worboys et al. (2005)
2005	<i>The Urban Imperative: Urban outreach strategies for protected area agencies</i>	Trzyna (2005)
2005	<i>The Protected Landscape Approach: Linking nature, culture and community</i>	Brown et al. (2005)
2005	<i>Benefits beyond Boundaries: Proceedings of the Vth IUCN World Parks Congress, Durban South Africa, 8–17 September 2003</i>	IUCN (2005)
2006	<i>Security Considerations in the Planning and Management of Transboundary Conservation Areas</i>	Braack et al. (2006)
2006	<i>Managing Protected Areas: A global guide</i>	Lockwood et al. (2006)
2006	<i>Forests and Protected Areas: Guidance on the use of the IUCN protected area management categories</i> (No. 12)	Dudley and Phillips (2006)
2006	<i>Sustainable Financing of Protected Areas: A global review of challenges and options</i> (No. 13)	Emerton et al. (2006)
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2007	<i>Peace Parks</i>	Ali (2007)
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2007	<i>Identification and Gap Analysis of Key Biodiversity Areas: Targets for comprehensive protected area systems</i> (No. 15)	Langhammer et al. (2007)
2007	<i>Protected Areas: Buffering nature against climate change</i>	Taylor and Figgis (2007)
2008	<i>Sacred Natural Sites: Guidelines for protected area managers</i> (No. 16)	Wild and McLeod (2008)
2008	<i>Protected Landscapes and Agrobiodiversity Values. Volume 1 in the series Values of Protected Landscapes and Seascapes</i>	Amend et al. (2008)
2008	<i>Protected Landscapes and Cultural and Spiritual Values. Volume 2 in the series Values of Protected Landscapes and Seascapes</i>	Mallarach (2008)
2008	<i>Guidelines for Applying Protected Area Management Categories</i>	Dudley (2008)
2010	<i>Connectivity Conservation Management: A global guide</i>	Worboys et al. (2010)

Year	Title	Reference
2010	<i>Natural Solutions: Protected areas helping people cope with climate change</i>	Dudley et al. (2010)
2010	<i>Sacred Natural Sites: Conserving nature and culture</i>	Verschuuren et al. (2010)
2010	<i>Arguments for Protected Areas: Multiple benefits for conservation and use</i>	Stolton and Dudley (2010)
2010	<i>50 Years of Working for Protected Areas: A brief history of the IUCN World Commission on Protected Areas</i>	IUCN (2010)
2011	<i>IUCN Guidelines for Protected Area Legislation</i>	Lausche (2011)
2011	<i>Protected Area Staff Training: Guidelines for planning and management (No. 17)</i>	Kopylova and Danilina (2011)
2012	<i>Ecological Restoration for Protected Areas: Principles, guidelines and best practices (No. 18)</i>	Keenleyside et al. (2012)
2012	<i>Protected Landscapes and Wild Biodiversity. Volume 3 in the series Values of Protected Landscapes and Seascapes</i>	Dudley and Stolton (2012)
2012	<i>Innovation for 21st Century Conservation</i>	Figgis et al. (2012)
2012	<i>Conserving Australia's Marine Environment: Key directions statement</i>	Figgis and Koss (2012)
2012	<i>Parks relaunched as an e-journal (after a gap in publication from 2008)</i>	Various
2013	<i>Terrestrial Biodiversity and the World Heritage List</i>	Bertzky et al. (2013)
2013	<i>Keeping the Outstanding Exceptional: The future of world heritage in Australia</i>	Figgis et al. (2013)
2013	<i>The Legal Aspects of Connectivity Conservation</i>	Lausche et al. (2013)
2013	<i>Governance of Protected Areas: From understanding to action</i>	Borrini-Feyerabend et al. (2013)
2014	<i>Urban Protected Areas - Profiles and Best Practice Guidelines</i>	Trzyna (2014)
2015	<i>Protected Area Governance and Management</i>	Worboys et al. (2015)



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