World Heritage reports 21

World Heritage Forests
Leveraging Conservation at the Landscape Level

Proceedings of the 2nd World Heritage Forests Meeting
March 9-11, 2005
Nancy, France

United Nations
Educational, Scientific and
Cultural Organization

WORLD HERITAGE FORESTS

LEVERAGING CONSERVATION AT THE LANDSCAPE LEVEL

Proceedings of the 2nd World Heritage Forest Meeting
March 9-11, 2005

Held at
Ecole nationale du génie rural des eaux et des forêts (ENGREF)
Nancy, France

Table of Contents

Disclaimer

The authors are responsible for the choice and presentation of the facts contained in this publication and for the opinions therein, which are not necessarily those of UNESCO and do not commit the Organization.

The designations employed and the presentation of the material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

© Published in April 2007 by
UNESCO World Heritage Centre
7, place de Fontenoy
75352 Paris 07 SP (France)
Tel: (33) 01 45 68 15 71
Fax: (33) 01 45 68 55 70
E-mail: wh-info@unesco.org
Website: http://whc.unesco.org

Editors: Marc Patry and Steven Ripley
Layout: PIPATPALLOP Porntip
Design: RectoVerso

Foreword

Humans began clearing large tracts of forests over 10,000 years ago, when Mesopotamian societies first learned that certain plants could be sown, tended, then harvested for food. It is now common knowledge that the development of agriculture went hand in hand with the emergence of the first human civilizations. Conversely, we have also come to learn that massive deforestation also has serious environmental, social and human implications. It is not by chance then that the first recorded laws aimed at protecting forests were passed by the leaders of Ur, a major Mesopotamian city, over 5,000 years ago.

Today, forests are being destroyed at unprecedented rates. With the loss of these forests, we also lose a great deal of the world's natural heritage – because forests, particularly tropical and subtropical forests, harbour a vast amount of the world's biodiversity. We furthermore place at risk the world's cultural diversity, for there exist many traditional cultures whose very subsistence depends on healthy forest environments, and whose knowledge and practices are in turn central to the conservation of the natural habitat.

Protecting and ensuring the sustainable management of forests has therefore become an intergovernmental priority of the highest order. The United Nations system has created many fora and initiatives with the specific mandate to ensure the conservation and sustainable use of forests, notably the UN Food and Agriculture Organization (FAO) and the UN Forum on Forests. Instruments such as the Convention on Biological Diversity *and the* Convention *to Combat Desertification also dedicate specific attention to the conservation of forest biodiversity. Furthermore, the second International Decade of the World's Indigenous People gives particular focus to the preservation of biological diversity, urging the need both to make full use of local and indigenous knowledge in addressing environmental challenges, and to consider cultural and natural conservation as mutually dependent.*

The UNESCO World Heritage Convention *is also a very important tool in helping identify and protect, for the benefit of current and future generations, the tremendous natural heritage contained in the most outstanding forest areas of the world. The* Convention *is designed to encourage international cooperation for the conservation of protected areas and to monitor their state of conservation. It also recognizes the close linkage that exists between the natural and cultural heritage.*

This latter theme is further developed in the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, which underlines the deep-seated interdependence between the preservation of the world's tangible and intangible heritage, and pays close attention to knowledge and practices concerning nature and the universe. UNESCO's Man and the Biosphere (MAB) Programme and the Local and Indigenous Knowledge System (LINKS) Project likewise focus on the interrelationship between cultural and biological diversity, and the need for a fully integrated approach to issues of environmental preservation and sustainable development.

...

...

The World Heritage Forest Programme helps focus attention on these challenges. It also demonstrates how the **World Heritage Convention** *can best be applied to the seemingly intractable problem of forest conservation. I am very pleased to note the progress that has been made in this regard, and hope that this publication will help to communicate successful practices to a broader audience, thus further stimulating the utilization of these tools for forest conservation.*

Koïchiro Matsuura
Director-General of UNESCO

Remarks

At the first World Heritage Forests meeting in 1998, 72 forest and biodiversity experts met in Berastagi, Indonesia to discuss the World Heritage Convention*'s role in the global conservation of tropical forests. Since then, many of the recommendations emerging from this meeting, particularly the inscription of priority forest sites on the World Heritage List, have been achieved. This is clearly demonstrated by the fact that the World Heritage List now contains some 91 forest sites accounting for approximately 13% all IUCN category I-IV protected forests.*

In the intervening years, largely thanks to the generous support provided by the United Nations Foundation and with the assistance of several international nature conservation NGOs the World Heritage Centre has been able to support many of the forest sites on the World Heritage List so that, as we go to print, the Centre is currently coordinating several projects supporting forest conservation in 21 World Heritage forest sites and in an additional 4 candidate sites around the globe, with a total budget of more than US $23 million. A significant portion of this conservation attention is directly attributable to the meeting in Berastagi.

The preceding figures aside however, the long term picture remains bleak for many forest sites on the World Heritage List, and the threats to most of these globally important biodiversity sites are in most cases increasing due to factors arising not from within the sites but from outside their boundaries.

The 2005 World Heritage Forests meeting was convened in Nancy for this purpose; how can a World Heritage forest protected area effectively interface with its surrounding landscape and stakeholders in order that its value is maintained in perpetuity? In short, how can a World Heritage forest site participate in a landscape or ecosystem approach to conservation and sustainable use.? Besides, once the necessary principles and mechanisms have been elaborated, what kind of support is needed for the site and its surroundings from the local, national and international communities?

The second World Heritage Forests meeting, organised by the World Heritage Centre, was hosted by the French national school of forestry – ENGREF in Nancy from March 9-11 2005. Forty professionals representing the major biodiversity conventions, donors, non-governmental organizations and training institutions worldwide, along with conservation practitioners, traveled to Nancy and exchanged ideas intensely over the three day meeting.

The Nancy meeting outputs are contained in the following publication, together with recommendations, as presented to the World Heritage Committee at its 29th session. Illustrating and reinforcing these recommendations are a selection of articles and case studies intended to assist all those involved in World Heritage forest site management, from the ground level site manager to the government decision maker, to move towards the integration of forest protected areas with their surrounding socio-economic and ecological landscapes. The publication also contains, for the first time, a snapshot on the State of

...

...

Conservation of World Heritage forests. I hope this will prove to be the first in a series of regular reports on World Heritage forests, helping us track progress over time, and thus become a valuable resource for forest conservation stakeholders worldwide.

Francesco Bandarin
Director, UNESCO World Heritage Centre
Paris, France

Note from the Editors

The numbers are self-explanatory. They clearly show the rapidly diminishing natural forest cover on the planet's surface, and a corresponding growth in the already huge global demand for forest products. Projecting this scenario 20, 40 or 60 years into the future cannot lead but to one conclusion. When the reduction in deforestation does finally occur, as it must, we may be hard pressed to determine whether it will be the result of effective conservation and sustainable forestry policies finally being broadly applied, or simply due to the fact that deforestation rates must inevitably fall as the resource becomes increasingly scarce.

The global community has been well aware of the situation for many years and has reacted in a number of ways. A good deal of financing earmarked to address the problem is being exercised through multilateral development banks and agricultural organizations. The Global Environment Facility, civil society and private foundations have also apportioned a major part of their resources to helping establish sustainable forestry initiatives. Beyond field level activities, several multilateral initiatives aiming to establish common policy objectives and directions for concerted reporting, and action, have arisen. The Convention on Biological Diversity *has its forest biodiversity programme, and concerned nations participate in the United Nations Forum on Forests, several of which have been hinting unsuccessfully for years at the need to create a stand alone agency dealing specifically with forest issues.*

It is hard to imagine that a greater response from the international community can ever be mustered. Yet despite these immense international initiatives, many underway for nearly two decades, there is little reason to believe that the rate of deforestation will slow in the coming decades. Developing a global corporate and social culture of sustainable forestry is the only foundation upon which humans will be able to enjoy a perpetual supply of forest products, while maintaining ecosystem services and a maximum biodiversity. However, the prognosis is now clear enough and alarming enough that increasing attention should be given to strict forest protected areas as a reasonable insurance against devastating biodiversity loss through the near eradication of most natural forest ecosystems on the planet.

The World Heritage Convention *is an ideal tool in this regard. It encourages national governments to identify and conserve the most important forest biodiversity sites and provides a transparent forum through which the international community can be engaged in cooperating with national governments to conserve them. Importantly, the* Convention *calls for regular monitoring of the State of Conservation of these sites, ensuring a strong measure of accountability in the process.*

The World Heritage Committee created the World Heritage Forest Programme to ensure that the tools available via the Convention *would not be overlooked in helping conserve the world's most outstanding forests. The March 2005 meeting in Nancy, held under the auspices of the World Heritage Forest Programme, was a benchmark in helping better define how the* Convention *can be applied to this end. We sincerely hope that an increasing number of forest conservation stakeholders will join those who*

...

...

participated at the Nancy meeting in recognizing the value of the **Convention***, and that they become actively engaged in using it to its full extent to safeguard those most significant forests on the planet.*

Marc Patry
Steven Ripley
UNESCO World Heritage Centre

Acknowledgements

The editors would like to thank the Permanent Delegation of the United Kingdom to UNESCO and the Goverment of France, through the France-UNESCO Convention, without whose financial support the meeting would not have been possible.

We also extend our appreciation to the contributors to this publication, many of whom traveled a long way to the meeting, participating actively and contributing their time and energy. We reserve a special thank you to all of those at ENGREF who assisted with the organization and hosting of the meeting, with special thanks to Capucine Badinier. We extend our final thanks to graduate student Ben Singer for his assistance with meeting organization, follow-up and intellectual contributions.

1

World Heritage Forests: What Value Added?

by Marc Patry[1]

[1] World Heritage Forest Programme focal point, UNESCO World Heritage Centre.

WHY A SPECIAL FOCUS ON FORESTS?

Forest ecosystems hold the vast majority of the world's terrestrial species, but ironically these same ecosystems are under the greatest chronic pressure from human activities. The most important threat in fact comes from permanent conversion to non-forest uses – typically agriculture. The FAO (2005a) calculates that since 1990, an average of nearly 12.3 million hectares of tropical and subtropical forest cover has been lost each year. Paradoxically while the total surface area of remaining forests is steadily reduced, these same shrinking forests are counted upon to supply a rapidly increasing demand for forest-derived products, both timber and non-timber[2] (table 1).

Table 1. **World consumption of forest timber products, 2002 (source: FAO, 2005b)**

Forest timber product	World consumption, 2002
Fuel wood	1,795,496,000 m^3
Industrial round wood	1,595,188,000 m^3
Sawn wood	388,361,000 m^3
Wood-based panels	197,343,000 m^3
Paper and paper board	324,224,000 t
Pulp for paper	185,364,000 t

Clearly, serious tensions exist between the very large and growing demand for timber products and the global community's explicit intention to conserve forest biodiversity. These tensions are compounded by additional demands placed on, and stress affecting, remaining forests – namely those arising from the massive subsistence on and commercial extraction of non-timber forest products, from climate change, from fragmentation and ecological isolation and from other human activities. Since the advent of agriculture over 8,000 years ago, approximately 40 percent of the earth's forest cover has been removed (e.g. 2.4 billion hectares, or approximately 2.5 times the surface area of Canada), most of it in the past 150 years (Bryant *et al.,* 1997). The obliteration of world forests for agriculture and urban and infrastructure development, along with the massive degradation of remaining forests through the siphoning off of forest ecosystem components, constitutes the largest single human-induced land use change and ecosystem modification on the global scale.

The global community is not unaware of this alarming trend, and a variety of mechanisms have been designed and established to ensure the conservation and sustainable use of forest ecosystems, both within and outside protected areas (box 1).

Box 1. Some international forest conservation and sustainable use mechanisms

- *United Nations Forum on Forests*
- *Congo Basin Forest Partnership*
- *WWF International Forests for Life Programme*
- *Convention on Biological Diversity – Forest Biodiversity Programme*
- *International Model Forest Programme*
- *Food and Agricultural Organization Forestry Programme*
- *Collaborative Partnership on Forests*
- *IUCN Forest Conservation Programme*
- *World Bank/WWF Forest Alliance*
- *International Tropical Timber Association*
- *Centre for International Forestry Research*
- *Forest Stewardship Council*

Most of these initiatives are policy-, programme- or project-oriented, and to succeed they generally rely on the goodwill of governmental authorities and on adequate and sustainable financing. Among these initiatives only the WH Convention offers a mechanism whereby the conservation of protected forests can be rigorously monitored, in this case by an intergovernmental committee to which governmental authorities must report. The WH Convention is also the only mechanism with the statutory power to request that appropriate conservation measures for the long-term integrity of protected forests be implemented.

Given its distinct comparative advantages and the vast expanses of forests currently inscribed on the WH List (13 percent of all IUCN category I-IV protected forests are WH – see discussion below), it is clear that the World Heritage Convention is uniquely positioned amongst international conventions, programmes and agencies to play a leading role for the *in situ* conservation of forest biodiversity. In recognition of this solemn responsibility to the global forest conservation community the WH Committee in its 25th session (WHC, 2001) agreed that forests warranted a specific focus, and approved the creation of a WH Forest programme (Decision XVII.10) to ensure that the WH Convention be leveraged as much as possible to further forest conservation on a global scale.

[2] The total volume of timber products consumed annually can fill an area 1km wide by 1km deep by 4 km high. Wood used for burning and charcoal production alone accounts for nearly half of this total.

WHAT CONSTITUTES A WORLD HERITAGE FOREST?

Reliably labelling a particular parcel of land as a forest is not as simple as one might imagine. Scientific and forestry literature is filled with various definitions of what actually makes a 'forest'. At one end of the spectrum, where vast expanses of land are completely covered by the forest canopy, there is usually no debate; however in geographical areas where forest cover is less dense, and becomes mixed with open grasslands, rocky mountain summits, ice fields or bodies of water, or where vast expanses of burned tree stumps or oil palm plantations now dominate the landscape, there is more room for discussion.

The definition is often expressed in terms of percent crown cover over a standard unit of area, e.g. the percentage of land which would be hidden from view by the forest canopy in aerial photography/remote sensing. Some will consider 15 percent forest cover as 'forest', while others will begin counting only when forest cover surpasses 50 per cent. Still others will refer to the presence of functioning forest-based ecosystems. In the end, the decision is subjective and must serve the purpose for which it was intended.

For the purpose of this paper, and for the sake of consistency with previous discussions on WH forests, let us use a slightly modified version of the definition first developed by Thorsell and Sigaty (1997):

Box 2. A World Heritage Forest is…

A World Heritage site for which the nomination file provided by States Party or WCMC forest data reveal a substantial amount of forest cover within ***the terrestrial component of the site and for which forest ecosystems contribute to the site's Outstanding Universal value (OUV).*** *(Emphasis added, corresponds to modification of the original Thorsell and Sigaty definition)*

Dudley and Phillips (2005) developed IUCN's definition, which is likely somewhat more inclusive than the definition above, whereby '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 percent' (Dudley and Phillips, 2005).

The expanded definition in the box above adds two critical nuances to the original definition of a WH Forest:

1. Sites comprised of mixed terrestrial and marine components, where the marine component is much larger (e.g. Cocos Island National Park, Costa Rica), would not have been considered WH forests in the previous definition.

2. By specifying that the forest ecosystems within a WH Forest must be recognized as contributing to the site's OUV, the definition creates a clear legal connection to the application of the WH Convention in regards to the conservation of these forests. This second nuance would rule out sites that may contain forests but have been inscribed on the WH List for values unrelated to these forests – *i.e.* where the WH Convention could not technically be used to promote the conservation of those forests.

Despite the changes, one could not expect to obtain identical results from independent exercises aiming at identifying those WH sites that would qualify as WH forests. Indeed, there is debate within the World Heritage community over the inclusion of certain sites within the WH Forest category. However given the difficulty in obtaining accurate and high-resolution information on forest cover within WH sites, this is a limitation within which the work must continue.

In this light, one could consider 91 WH sites as WH Forests in the wake of the 30th World Heritage Committee meeting of July 2006 (see Annex 1 for a complete site listing); the total surface area of these 91 WH forest sites is well over 75,347,291 hectares (approximately 1.5 times the surface area of France, or equivalent to that of Chile). However in several cases it is clear that large components of some WH forest sites have no forest cover whatsoever. The most dramatic example by far is Lake Baikal in Russia, where the site's namesake covers 3.15 million hectares of the 8.8 million hectare site. By subtracting these most obvious and measurable non-forest components from those WH Forest sites that feature them, we may obtain a better measure of the total forest cover within WH Forest sites[3]. This figure comes to just over 63.7 million hectares of forest cover, spread across 91 WH Forest sites in 50 countries and spanning the four major biomes (tropical, subtropical, temperate and boreal). The figure accounts for approximately 1.6 percent of the global forest cover and a very significant 13 percent of all IUCN category I-IV protected forests (see Chapter on the state of WH Forests for a description of how these figures were reached).

Arriving at an absolute figure of WH forest coverage is further complicated by the fact that within the remaining 96 natural and mixed (inscribed for both natural and cultural values) WH sites not considered as WH Forests here,

[3] This figure would likely continue to include a smaller proportion of non-forest lands. The author assumes that FAO forest cover figures would include a similar proportion of non-forest areas, as global level forest cover assessments likely do; this underpins a reasonable comparison between WH and FAO figures later in this article.

it is likely that the combined forest cover could amount to a significant figure: possibly up to several million hectares[4]. One can also consider the measurable presence of forest cover within many of the 50 'cultural landscapes' inscribed in the WH list (e.g. the Hallstatt-Dachstein Salzkammergut Cultural Landscape in Austria). Thus between non-forest natural WH sites, forest natural WH sites and cultural landscapes, at least 63.7 million hectares of forest cover enjoy at least some protection under the auspices of the WH Convention (even if not always directly contributing to a site's OUV).

A DISTINCT WORLD HERITAGE FOREST CONSERVATION STRATEGY

Being clear on what sets WH forests apart from other non-forest protected areas and WH sites allows for the articulation of a WH forest-specific conservation strategy for the WH Centre. In general, protected forests differ from other terrestrial protected areas (e.g. grasslands, wetlands, mountains, deserts) in several ways. One set of differences is based on ecological characteristics, which in turn leads to a second set of differences related to management concerns.

A. Ecological Distinctions

i) Biodiversity: Forests usually contain higher biodiversity than other types of terrestrial ecosystems, particularly tropical and sub-tropical forests. The latter may contain up to two thirds of known terrestrial species.[5]

ii) Ecosystem services: Forest ecosystems usually have elevated rates of evapotranspiration and are important stores of locked up carbon; these factors play important roles in regional and global climate patterns. Forest ecosystems provide effective water retention and filtration services, also reducing soil erosion – these services provide valued benefits, downstream and 'downhill'. In many cases forests also serve as the breeding habitat for important subsistence species, which migrate into the surrounding landscape where they can be harvested by indigenous and/or nearby communities. Similarly, forests worldwide are critical to the breeding and wintering successes of a great proportion of migratory birds, and thus support the large international economy generated by birders[6]. These characteristics represent substantial and tangible services to humans and human communities both locally and globally, but are not usually accounted for.

iii) Complexity: Many forest species have evolved within a matrix of diverse natural forest habitats with a great variety of ecological niches (e.g. diverse levels of shading, nutrient cycling, water retention, humidity, micro-climate effects, diverse tree structures, associated wetlands, natural fire regimes etc.). When natural forests are transformed by varying intensities of management (e.g. from outright plantations to sustainable extraction of non-timber forest products), forests are at risk of losing these complexities and critical habitats and of an eventual reduction in biodiversity. A famous case in point is Mexico's imperial woodpecker, the largest in the world. This bird is feared extinct, not necessarily due to the destruction of its forest habitat (large tracts of its original forest habitat remain in parts of Mexico) but rather to the removal of the forest *structures* critical to its survival: selective logging within those forests has removed all the large, old trees, critical for the bird's nesting cavities (see figure 1).

Figure 1. Mexican Imperial Woodpecker – the world's largest. Given its large size, it needed very large trees in which to excavate its nesting cavities. The selective harvest of these trees has eliminated all nesting possibilities, driving this bird to extinction. © Fritz Geller-Grimm, Wiesbaden Museum

These first three points favour the setting aside of strict forest protected areas, for conserving the world's biodiversity but also for contributing to the protection of ecosystem services at local and global levels. However these same characteristics often lead to the proximate causes of great threats to WH forest sites, and to distinct management challenges for site managers (see figure 2).

B. Management Distinctions

iv) The quest for forest products: Forests contain many high-value renewable resource species, and as such they usually represent a greater store of potential material wealth than non-forest ecosystems for people and societies seeking fuel, building materials, food, medicines, 'free' land for cultivation or other subsistence, or culturally prized products such as feathers, skins,

[4] For example, the contiguous Serengeti National Park and Ngorongoro Crater Conservation Area likely contain a few hundred thousand hectares of forests, though these sites are not significantly forested as a whole.

[5] See UNDP *et al.* (2000) *World Resources 2000-2001. People and Ecosystems: The Fraying Web of Life.* United Nations Development Programme, United Nations Environment Programme, World Bank, World Resources Institute.

[6] In 2001, birders in the USA alone spent US$ 31 billion on goods and services to pursue their activities (Pullis La Rouche, 2003).

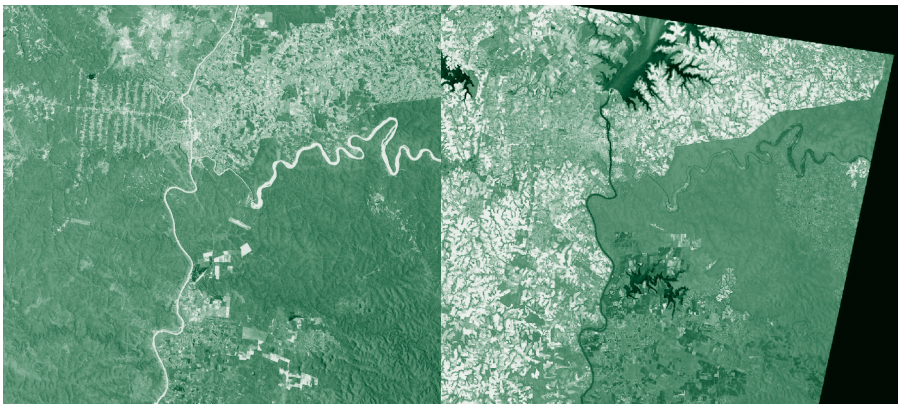


image © Cnes

Figure 2. Iguaçu NP (Brazil) and Iguazu NP (Argentina), straddling the Argentina-Brazil border (the east-west winding river). Photographs are shown from 1973 (left) and 1998 (right). Paraguay, where no NP exists, is to the left of the N-S river and forest cover has been almost completely obliterated. Note the forest regeneration that has occurred within Iguaçu National Park, immediately above the winding bends in the Iguaçu River.

flowers, pets and ivory. Protected forests are often the last remaining high-concentration/economically viable sources of such sought-after products. As surrounding forest resources become scarce or inaccessible due to overexploitation, competition or privatization (see figure 1), the value of remaining resources 'locked up' in WH forests can become so high as to incite individuals and communities to defy the law and/or cultural traditions established over many generations. In such cases they may carry out extensive subsistence or even commercial poaching activities targeting a wide range of species, and in many instances they may be willing to resort to violence to acquire those resources.

v) Ecological isolation: The deforestation, or radical simplification, of forest ecosystems surrounding WH forests is leading to the increasing ecological isolation of WH forests in the landscape (see figure 2). This isolation has been shown to lead to the loss of viable populations of component species who either a) depend on forest cover for migration, or b) have collective home ranges that surpass the size of the protected lands. Ironically, increased ecological isolation is also considered by most ecologists to significantly increase the vulnerability of protected areas to climate change.

Given these distinguishing characteristics, one can conclude that protected forests should be a high-priority terrestrial ecosystem for the conservation of biodiversity and for the maintenance of valuable ecosystem services. One can also conclude that conservation challenges in many such forests arise in large part in the landscape within which the forest is located; these challenges include not only the potential threats from incursions by people seeking subsistence or commercial resources or arable land (generally a greater challenge in developing country settings), but also the broader effects of the incremental isolation of protected forests from other forest ecosystems (a more widespread threat to WH forests worldwide). The severity of these effects depends on neighbouring land uses, population densities and ease of access, socio-economic conditions and the cultural proclivities of local communities. In fact, an analysis of existing threats to those WH Forest sites placed on the list of WH Sites in Danger provides clear evidence of the role of outside forces in undermining the integrity of WH Forests.

WORLD HERITAGE FORESTS IN THE LANDSCAPE

As noted above, many current threats to WH forests arise in the landscape within which they exist. Some typical threats are presented in box 3 below:

Box 3. Threats to World Heritage forest sites originating from decisions or actions taken at the landscape level, with examples

- *Upstream pollution of waterways, agricultural runoff feeding into WH forests, including dam construction (Doñana National Park, Spain; Durmitor National Park, Montenegro; Three Parallel Rivers of Yunnan Protected Areas, China)*
- *Establishment of transportation and utilities corridors affecting migratory patterns and water flows, and facilitating illegal access to protected areas (Manas Wildlife Sanctuary, India; Sangay National Park, Ecuador; Lake Baikal National Park, Russia; Tropical Rainforest Heritage of Sumatra, Indonesia)*
- *Agricultural practices increasing the susceptibility to disease of, and conflict with, PA wildlife e.g. cattle ranching and bovine tuberculosis, predation by carnivores (Yellowstone National Park, USA, Wood Buffalo National Park, Canada)*
- *Point-source air pollution resulting in acid rain over WH forests (Great Smoky Mountains National Park, USA)*
- *Introduced species invading WH forest ecosystems (Iguaçu National Park, Brazil)*
- *Industrial development affecting home ranges of WH forest species (Canadian Rocky Mountain Parks, Canada)*
- *Urban development patterns inconsistent with WH forest integrity (Iguaçu National Park, Brazil)*

Typically, WH forest site managers and conservation stakeholders are neither well-equipped to participate in broader landscape level dialogues nor do they have mechanisms in place to influence many decision-making processes. Though Environmental Impact Assessment processes are increasingly common and can be used to ensure that WH Forest conservation concerns are taken into consideration, these remain the exception and in many cases can be structured in ways to discount the importance of less tangible values derived from protected areas. As a result landscape-level decisions are made, or processes left unchecked, that result in direct negative impacts to the integrity of a WH Forest site.

The WH Convention has been leveraged in the past to support landscape-level decision-making processes favouring WH sites, though the case studies illustrated in box 4 show that this is most often done in a reactionary manner once a threat has been detected. Though this has often proved effective, there would be even greater benefit in using the *Convention* proactively.

Box 4. Case studies illustrating how the* World Heritage Convention *can leverage landscape-level action

1. *Durmitor National Park (Montenegro): A proposed dam outside of the site, which would have flooded the park canyon, was cancelled after a recommendation was made to put the site on the WH in Danger list should it proceed.*
2. *Lake Baikal National Park (Russia): The proposed trajectory of an oil pipeline would have taken it through the freshwater delta leading into Lake Baikal, creating a permanent major risk in case of a pipeline accident. The route was modified following the WH Committee's decision to place the site on the WH in Danger list should the initial route be maintained.*
3. *Sangay National Park (Ecuador): Road construction through the southern portion of the site was taking place with little concern for environmental impact, leading to the site's inscription on the list of WH in Danger. The WH Committee's insistence that full environmental mitigation measures be implemented resulted in better road design and reduced impact on the site, eventually helping to remove the site from the Danger list.*
4. *Cologne Cathedral (Germany): Proposals to build a high-rise tower one kilometre from the cathedral were shelved after the site was placed on the WH Danger list, over concerns that its Outstanding Universal Value (OUV) would be compromised due to the loss of its pre-eminence in the cityscape.*

WORLD HERITAGE FOREST PROGRAMME IMPLICATIONS

The Nancy Meeting – March 2005

Recognizing the narrowing scope for future WH Forest inscriptions (see article in this publication on the state of WH Forests) and taking note of threats particularly common to WH Forests, the WH Centre organized a three-day meeting of international experts and stakeholders at France's *Ecole Nationale du Génie Rural des Eaux et des Forêts* (ENGREF), the national forestry school in Nancy. The meeting was also planned as a follow-up to the successful Berastagi meeting, organized by the WH Centre and hosted by CIFOR in Berastagi, Indonesia. Whereas the Berastagi meeting was focused on identifying new potential WH tropical forest sites, the Nancy meeting sought to shift the debate to the conservation and management of existing WH forest sites within a broader landscape context – partly in an effort to explore ways through which the *Convention on Biological Diversity* (CBD) ecosystem approach could be applied. The attendees recognized that many, if not most, of the serious threats to a WH Forest can only be properly addressed from a landscape perspective. In the Nancy Statement (Chapter 3), participants emphasized the need to have each site perceived in terms of linkages with its wider environment; they also produced a series of recommendations emphasizing the use of the WH Convention as a tool to encourage the consideration of landscape-level interactions during the nomination process.

Signatories to the Nancy Statement also noted the importance of developing and monitoring indicators of WH forest site integrity, including those landscape processes critical to maintaining the OUV of the site. In this regard they expressed a concern that existing criteria for inscription to the WH list were not effectively linked to indicators for monitoring site integrity, and recommended that nomination forms include the monitoring of elements within the broader landscape that could impact on the value and integrity of the site under consideration.

CONCLUSION

Inscribing forest sites to the list of World Heritage is an effective means of extending international oversight and protection to those terrestrial ecosystems containing the greatest densities of biological diversity on the planet, both within and beyond the immediate WH site boundaries. To this end the WH Centre, the WH Committee and States Parties to the WH Convention have all been busy: over 74 million hectares of WH Forest sites, representing 13 percent of all IUCN category I-IV protected forests worldwide and 1.6 percent of all forest cover on the planet, are currently protected within 91 WH forest sites in 50 countries. These figures do not address the uncounted but significant expanses of forest enjoying some degree of protection under the WH Convention and found in many

of the remaining natural WH sites (and in some cases in cultural landscapes).

These facts entrust the stewards of the *World Heritage Convention* with an enormous responsibility to ensure that the *Convention* is used as effectively as possible, so that maximum support to national governments is provided in order to conserve this irreplaceable forest patrimony. Many other international efforts are being made to conserve these forests, but the WH Convention is the only instrument that compels nations, partly through a rigorous monitoring process, to work together to ensure long-term protection.

The Berastagi meeting in 1998 was a landmark event in promoting the nomination of several new tropical WH forest sites – so much so that according to the WCMC-UNEP and IUCN, forests from the four principal biomes are now generally well represented on the WH list, notwithstanding a few specific forest ecosystems that require further attention.

It is now most appropriate for the stewards of the WH Convention to concentrate their resources on helping WH forest management stakeholders to develop mechanisms that deal with the most common threats to site integrity. According to the participants at the Nancy meeting in 2005, these threats are often rooted in decisions taken at the broader landscape level. The challenge thus lies in facilitating WH forest management stakeholders' participation in landscape- or ecosystem-level land use decision-making processes, so that WH forest conservation concerns can be articulated at the very outset of any considerations with potentially harmful effects.

The participants in the Nancy meeting focused a large part of their discussions on this subject. The results of their work are presented in this publication, as a contribution to the evolving discourse.

2

The State of Conservation of World Heritage Forests

by Marc Patry[1], Clare Bassett[2] and Bénédicte Leclercq[1]

[1] World Heritage Centre, UNESCO, Paris.
[2] Consultant to the World Heritage Centre, UNESCO, Paris.

INTRODUCTION

No previous systematic and standardized assessment of the state of conservation (SOC) of WH forests has been made to date, beyond the assembly of basic quantitative attributes of these sites as a group and qualitative summaries of conservation issues on a site by site basis (Thorsell and Sigaty, 1997). Though the WH Centre began a six-yearly periodic reporting on the SOC of WH sites in 1999 focusing on one of six geographic regions annually, this process is still being improved and the information gathered is highly variable in consistency and detail; it is thus not readily interpreted for the purposes of comparative temporal or spatial analyses. At the request of the WH Committee occasional site-level 'reactive monitoring' missions are carried out by WH Centre and IUCN staff, during which a variety of information points, under no standard format, is gathered. Some global initiatives are under way in an attempt to standardize a set of criteria across all protected areas, in such a way as to permit quantitative and comparative analyses specifically through various Management Effectiveness Assessment methodologies. These include the Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) methodology developed by WWF, the World Bank/ WWF tracking tool (both further discussed in a subsequent paper in this publication) and recently the WH Centre's own Enhancing our Heritage methodology. Though they are useful these methodologies have been applied haphazardly and only to a very few WH sites to date, resulting in very limited analytical use across WH Forest sites.

Despite these limitations there does exist some information, readily available to the WH Centre, which permits it to monitor objective and quantitative indicators on the following attributes of WH Forests:

1. Extent and nature of WH Forest coverage
   - i) Total area of WH Forests (by region, by biome)
   - ii) Total forest cover within WH Forest (by region, by biome)
2. Relative importance of WH Forests to global forest conservation
   - iii) Ratio of total WH forest cover to total global forest cover
   - iv) Ratio of total WH forest cover to total IUCN category I-IV protected forests
3. State of conservation of WH Forests
   - v) Number of WH Forests on the List of WH in Danger
   - vi) Proportion of WH Forests on the List of WH in Danger
   - vii) Threat intensity to which WH Forests are subjected
   - viii) Average threat intensity for entire WH Forest network

These indicators can be tracked over time, providing important information on trends and allowing for a variety of practical analyses. All raw data used to generate the graphs in this paper can be found in Annex 1 of this publication, and on the World Heritage Forest Programme website at http://www.whc.unesco.org/en/forests .

1. EXTENT AND NATURE OF WORLD HERITAGE FOREST COVERAGE

It is possible to draw a picture of the WH Forest programme as a whole, using data on the size and forest cover of WH Forest sites. Manipulating data on a regional or temporal basis provides additional information, allowing for comparative analyses between regions, biomes and over time. Data for two indicators can be readily obtained for this analysis:

INDICATOR 1: Total area of WH Forests

This figure represents the total surface area of sites considered as WH Forests[3]; figures for surface area are obtained from the WH site nomination dossiers presented to the WH Centre by national authorities. Though less accurate than the following indicator in terms of providing a measure of actual forest area enjoying WH status, this figure is more precise in that there can be little argument over its numerical value, and it may also encompass broader non-forest ecosystems on which forests, or forest component species, may depend for long-term survival.

INDICATOR 2: Total forest cover within WH Forests

Given the definition of a WH Forest (see footnote 3 below), it is not unusual for WH forest sites to contain significant expanses of non-forest ecosystems. Though this would likely be the case for any large-scale (e.g. national government, FAO) effort at measuring very large expanses of forest cover (e.g. water bodies, glaciers, rocky areas, major wetlands, prairie/open savannah ecosystems), the authors wish to be as conservative as possible (as per readily available information allows) when citing actual forest cover figures for WH forest sites.

To this end, a desktop analysis of information available on-line from both WCMC and from the original WH site nomination dossiers was carried out in an effort to identify and quantify the non-forest area of WH forest sites. In some cases very obvious non-forest components were removed from the total surface area of the WH forest site, leaving a significantly reduced value for the WH forest site's actual forest cover. Some egregious examples include Lake Baikal (where the lake component alone covers 3.15 million hectares or

[3] WH Forest: A World Heritage site for which the nomination file provided by State Party or WCMC forest data reveals a substantial amount of forest cover within the terrestrial component of the site, and for which forest ecosystems contribute to the site's OUV.

36 percent of the site's total area), some mixed land/marine sites for which the marine component is much larger (e.g. Cocos Island National Park in Costa Rica, 99 percent of which is non-forest cover). Though a review of all WH Forest dossiers and WCMC data sheets was carried out, final forest cover figures may still not be accurate for each WH Forest site as a result of frequently incomplete or inaccurate source information or low-resolution mapping. The forest cover values for each site are subject to constant refinement, and the authors welcome any information that would help them ensure greater precision.

1.1. World Heritage Forest Coverage – Number, Surface Area and Biomes of World Heritage Forests

The year 1997 is an arbitrary benchmark against which the current number and surface areas of WH Forests is compared, though there is some degree of rationale for its selection: the first published values for WH Forest coverage included all WH Forests inscribed to 1997 (Thorsell and Sigaty, 1997). That year is also the baseline against which to assess the 1998 push to increase the coverage of tropical biome WH Forests (subsequent to the 1st WH Forest meeting known as the Berastagi meeting). Comparing the 1997 figures to those of 2006 provides some information on the extent and nature of changes to WH Forest representation on the WH List, and on how well the Berastagi meeting did in promoting the identification and inscription of tropical forests to the WH list. This information is summarized in the charts that follow.

There were 64 WH Forest sites as of January 1997 (including one site not initially considered under Thorsell and Sigaty's more restrictive definition of a WH Forest). By 2006 (subsequent to the July WH Committee meeting) an additional 28 forest sites had been inscribed (a 44 percent increase). The vast majority of these (22) were tropical forests, reflecting in large part the successful post-Berastagi efforts to increase the representation of these biodiversity-rich sites on the WH list (see chart 1).

The second chart (chart 2 below) shows that the total area of WH Forest sites increased from 53.6 million hectares to nearly 75.3 million hectares, an increase of over 22 million hectares (41 percent). This suggests that the

Chart 1: Number of World Heritage Forest Sites, 1997-2006

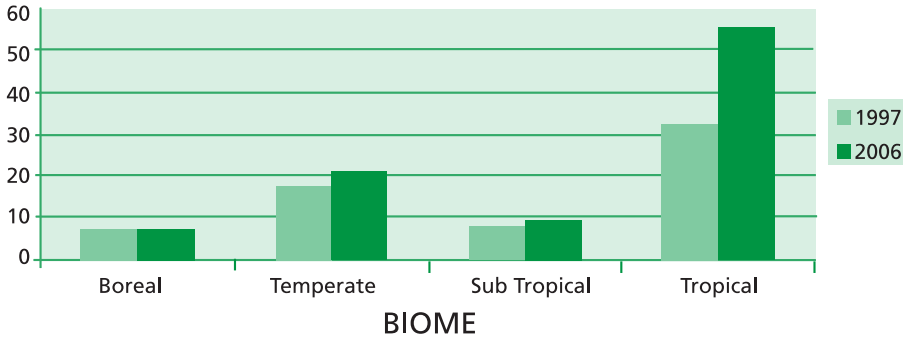
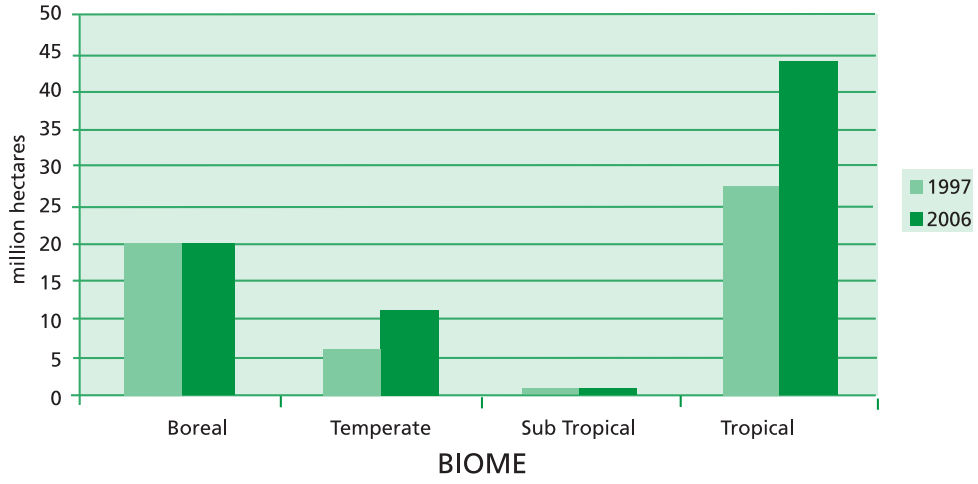


Chart 2: Change in Total World Heritage Forest Area, 1997-2006



average size of WH Forest inscriptions since 1997 has not changed significantly (approximately 840,000 ha), though there are considerable differences in average size between forest types (see discussion in 1.3. below).

1.2. Area of Forest Cover within World Heritage Forest Sites (indicator 2)

Chart 3 compares the total surface area of WH Forest sites with the total forest cover within WH Forests, for each of the four main forest biomes. Whereas the total area for all WH Forest sites amounts to 75.3 million hectares, this figure drops to 63.7 million hectares when identifiable non-forest lands are removed from the total (based on available information; actual figure may be different). See annex 1 for forest cover values for individual WH Forest sites.

1.3. Regional Representation

Chart 4 illustrates the regional distribution of WH Forests by number, while chart 5 illustrates it by total forest cover with WH Forests (APA = Asia Pacific, Eur NA = Europe and North America, LAC = Latin America and the Caribbean). Comparing these two charts quickly reveals how average WH Forest size is larger in the Eur NA region, and smaller in the Asia Pacific Region.

1.4. Average World Heritage Forest Size

Tropical WH forests are numerous (55 out of 91), have large average areas of forest cover (707,000 hectares) and are dominated by six sites with more than 2.5 million hectares of forest cover each (Central Amazon Conservation Complex, Brazil; Selous Game Reserve, Tanzania; Canaima National Park, Venezuela; Lorentz National Park, Indonesia; Tropical Rainforest Heritage of Sumatra, Indonesia; Salonga National Park, Democratic Republic of Congo). The smallest WH Forest sites are also represented in this group, three of which are under 3,000 hectares and the smallest standing at 18 hectares (Vallée de Mai Nature Reserve, Seychelles; Cocos Island National Park, Costa Rica; Brazilian Atlantic Islands, Brazil). Being so small they contain very little forest cover, less so probably than many

Chart 3: World Heritage Forest Area, and Total Forest Cover, 2006

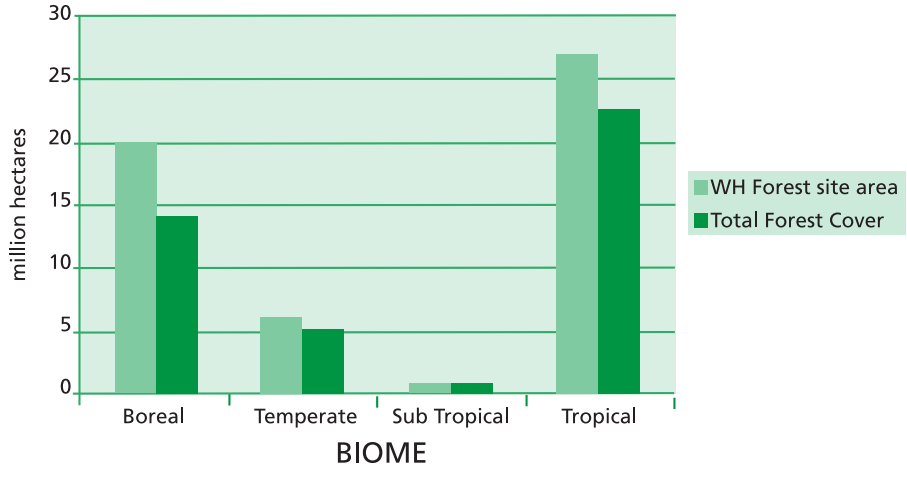


Chart 4: World Heritage Forest Sites by Region (number; %)

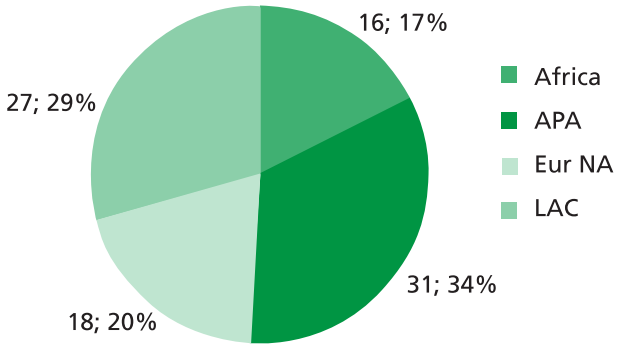


Chart 5: Total Forest Cover Within World Heritage Forest Sites by Region (ha; %)

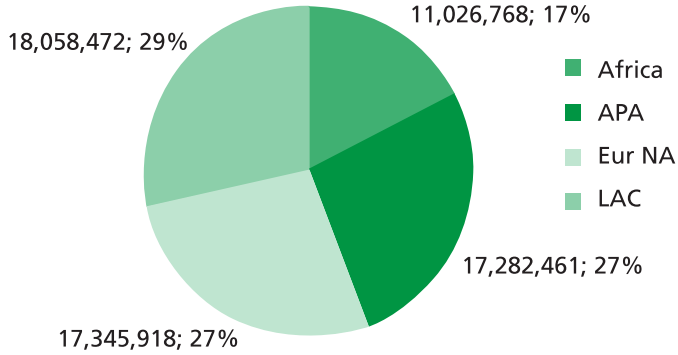


Table 1. **World Heritage forest cover areas in 4 biomes**

Biome	Average forest cover area (ha)	Largest forest cover area (ha)	Smallest forest cover area (ha)
Tropical	707,000	6,076,000	18
Sub-Tropical	101,000	370,000	3,984
Temperate	446,000	2,000,000	15,400
Boreal	1,900,000	5,650,000	162,450

natural WH sites not considered Forest sites, and likely less than many cultural landscape sites and even some cultural sites (though in these latter sites the forests are not formally recognized as contributing to their OUV and hence could not be readily expected to benefit from protection under the WH Convention).

Subtropical WH forests are far fewer in number (nine out of 89) with a comparatively much smaller area (average forest cover of 101,000 hectares), a likely reflection of the relative scarcity of such forests on the planet. The few boreal WH forests (seven) are dominated by the vast Lake Baikal (Russia) and Wood Buffalo (Canada) sites, each with a forest cover of approximately 4.5 to 5.5 million hectares, while the 20 temperate WH forests, with an average forest cover of 446,000 hectares, are led by four sites of over 1 million hectares of forest cover each (Te Wahipounamu, New Zealand; Three Parallel Rivers of Yunnan, China; Central Sikhote-Alin, Japan; Tasmanian Wilderness, Australia).

2. RELATIVE IMPORTANCE OF WORLD HERITAGE FORESTS TO GLOBAL FOREST CONSERVATION

Assuming the availability of accurate global forest cover information, along with a similarly available mapping of all existing forest protected areas of the world, it would be possible to obtain a measure of the relative contribution and importance of WH Forests to global forest conservation initiatives. Data on these indicators is available and though its reliability is not certain, in combination with data on WH forest cover it can begin to provide valuable information in measuring the following two indicators:

INDICATOR 3: Ratio of total WH forest cover to total global forest cover

INDICATOR 4: Ratio of total WH forest cover to total IUCN Category I-IV forest cover

In practice, it remains difficult to obtain a very accurate value describing the proportion of WH Forest to forest coverage worldwide, or more specifically to protected forests. Doing so would require the simultaneous application of a high-resolution methodology to measure and accurately map the extent of real forest cover in every country (according to a commonly agreed definition of forest cover), and the ability to overlay that map with the accurate boundaries of all protected areas of the world including those that enjoy WH status. Though the FAO assembles forest cover data on a regular basis, it does so in recognition of significant resolution limitations.

Despite these handicaps, a review of the literature does reveal a variety of efforts at determining reasonably accurate values for these indicators, though results usually involve data obtained over different timeframes (thus factoring in any error related to changes in forest cover during that time) or with varying degrees of accuracy. As a result, the values obtained for the proportion of the world's forests that enjoy WH status vary measurably. Iremonger *et al.* (1997), using GIS technology and information obtained from a great variety of national and regional sources, produced a global forest cover map onto which were overlaid protected area boundaries found within the UNEP-WCMC's global database. Their calculations (allowing for a degree of uncertainty due to variable mapping resolutions and protected area boundary mapping difficulties) accounted for 3,988,792,400 hectares of global forest cover in 1996, of which 311,283,500 hectares were located in IUCN category I-IV protected areas. Using the forest cover value for WH Forest sites in 1997 (42,759,174 ha), one would obtain a proportion of 13.7 percent of total IUCN Category I-IV protected forest area as enjoying WH status in 1997.

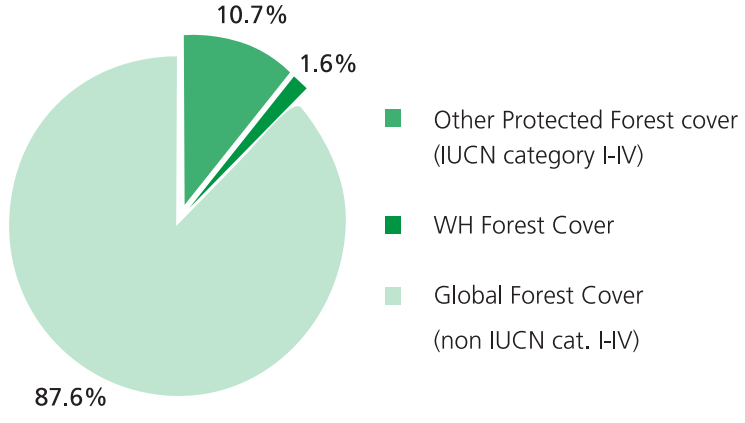
In Chapter 7 of its Global Forest Resources Assessment (FAO, 2001), the FAO puts forward a total forest cover of 3,869,455,000 hectares with a total IUCN category I-IV protected forest cover of 479,000,000 hectares, based on the UNEP-WCMC database in part but also using various methodologies (again, admitting to a degree of uncertainty)[4]. With these numbers and relying on 2006 WH forest data, one obtains a proportion of 13.3 percent of total IUCN Category I-IV protected forest area as enjoying WH status in 2005 (assuming that the 2001 figure used in the study has not changed dramatically).

[4] One is left questioning the apparently dramatic increase in the area of IUCN category I-IV forests during this relatively short period (a 54 percent increase in five years). Discussions with the co-author of one of these studies suggest that this increase is likely due to a real increase in the area of protected forests and the application of a different methodology (Corinna Ravilious, WCMC, personal communication).

Table 2. **Ratio of World Heritage forest cover to global and IUCN category I-IV forest cover**

Year	Total Global Forest Cover	Total IUCN Category I - IV forests	Total WH Forest cover	WH Forest cover / IUCN cat I-IV	WH Cover / Global Forest cover
1997 (Iremonger et al., 1997)	3,988,792,400	311,283,500	42,759,174	13,7%	1,1%
2006 (FAO, WCMC)	3,869,455,000	479,000,000	67,713,619	13,3%	1,6%

Chart 6: World Heritage Forest Cover in relation to Global and IUCN Category I-IV Forest Cover



Whether 13.3 or 13.7 percent, this relatively large proportion of protected forests inscribed on the WH list implies an important mandate for the WH Committee: advancing the interests of global forest biodiversity conservation. Similarly and assuming the complete support of the WH Convention, that the forest cover in WH forests will never decline and will likely increase, and that global forest cover will undergo many more years of decline before stabilizing, the WH forest cover as a proportion of global forest cover is set to increase regularly. This trend is already apparent in the 45 percent increase in this ratio over the past nine years (1.1 percent to 1.6).

3. STATE OF CONSERVATION OF WORLD HERITAGE FORESTS

The WH Forests indicators for which data acquisition is most challenging are those that provide tangible and comparable measures of the state of conservation of individual sites. Though fairly detailed information on conservation challenges at various WH Forest sites is regularly gathered by the WH Centre (through its reactive monitoring process and by way of third party information), the data so obtained is rarely of a nature that allows for objective, quantifiable analysis. The fact is that there is no systematic, network-wide process through which uniform, reliable and quantifiable data is regularly gathered. Under these severe limitations, a pragmatic approach to identifying and developing practical indicators for the state of conservation of individual WH Forests is required. A closer look at the type of data available at the WH Centre leads the authors to propose four such indicators. The first two (indicators 5 and 6) are based on WH Forest sites' possible inscription on the list of World Heritage in Danger, and the next two (indicators 7 and 8) assess whether monitored conditions at individual WH Forest sites reveal significant-enough threats to trigger a call for particular attention from the WH Committee.

INDICATOR 5: Absolute number of WH forest sites on the List of WH in Danger

INDICATOR 6: Proportion of all WH Forest sites on the List of WH in Danger (number of WH Forest sites on Danger List / total number of WH Forest sites).

The WH Committee has the option of inscribing a WH site on the list of WH in Danger when the site's OUVs appear to be threatened by ascertained or potential danger (see Convention text, Article 11, and operational guidelines paragraphs 177-198). 'Danger Listing' serves to highlight a heightened state of concern over a site's integrity, and to draw the attention of national and international conservation stakeholders to the threats in order to mitigate or eliminate them.

In 2006, eight WH Forest sites (or 8.7 percent of all WH Forest sites) were on the Danger list (see chart 7). Since 1992, when the first WH Forest sites were inscribed on the List of WH in danger, the proportion of WH Forest sites on the Danger list has ranged from as low as 7.3 percent (1993) to as high as 14.7 percent (1999). This indicator could be a measure of the degree to which WH Forests were under threat worldwide. The values for indicators 5 and 6 since 1992 are illustrated in Chart 7, and a list of all WH Forest sites inscribed on the List of WH in Danger is provided in table 3.

A future indicator of the state of WH Forests overall might focus on the forest surface area of WH forests in danger as a proportion of total WH Forest cover, and such an indicator would provide a more accurate picture than indicator 6. However, given the on-going unreliability of forest cover values within WH forest sites, it is premature to take it into account.

The average time spent on the Danger list for WH Forests is nine years[5]. A review of the threats that affect those sites on the Danger list for less than the average duration (see table 4) usually show threats that tend to be fairly well circumscribed, and arising from one or a few institutional decisions (e.g. infrastructure development, visitation management, certain biologically-related management issues). Sites that remain on the Danger list for more than the average nine years tend to be afflicted by systemic issues, such as generalized conflict and large poverty-driven social movements.

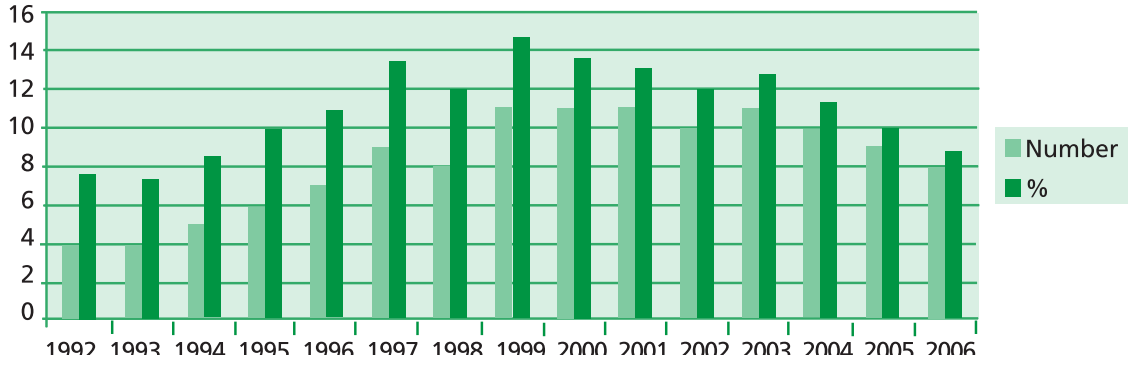
INDICATOR 7: Threat intensity to which WH Forests are subjected

The previous indicators (5 and 6) focusing on the number and proportion of WH Forest sites on the Danger list are useful but limited, in that they provide very narrow information on the state of conservation of a restricted number of WH Forest sites (e.g. eight out of 91 as of the WH Committee meeting in 2006), or on how WH Forest sites are faring as a whole. Indicator 7 overcomes these limitations by providing information on the changing state of conservation for each WH Forest site.

4. STATE OF CONSERVATION (SoC) REPORTING

Throughout the year, the WH Centre and IUCN receive both unsolicited and solicited information related to emerging and on-going conservation issues in natural WH sites, from a variety of sources. Once a year, in the run up to the World Heritage Committee meeting, the IUCN and WH Centre meet to review and discuss information gathered during the previous months and jointly decide whether conditions warrant that a particular site and its conservation issues should be brought to the attention of the WH Committee for discussion and action. In the affirmative, the WH Centre and IUCN prepare a State of Conservation Report (or SoC Report) which includes a brief analysis of the conservation threats to the selected sites along with a draft decision for the WH Committee's consideration. Typically, a SoC report will be requested when the values for which a site was inscribed on the WH List appear to be significantly threatened by either existing processes (e.g. illegal logging) or potential processes with a high likelihood of taking place (such as plans for road construction).

Chart 7: Number and Proportion of World Heritage Forest Sites on Danger List



[5] This includes eight sites that remain on the Danger list and are likely contributing annually to an increase in the average time on the Danger list, as most show no indication of being removed from the list in the foreseeable future.

Table 3. **World Heritage Forest sites previously and currently on the Danger list**

Country	WH Forest	Threats (taken from World Heritage Centre State of Conservation Reports)	Year inscribed on:		Yr Removed from Danger List	# Yrs on Danger List
			WH List	Danger List		
Croatia	Plitvice Lakes National Park	High vehicle traffic through the park, excessive and poorly managed visitation.	1979	1992	1997	5
Ecuador	Sangay National Park	Poaching, illegal livestock grazing, encroachment along the park's perimeter, unplanned road construction.	1983	1992	2005	14
Guinea/ Ivory Coast	Mount Nimba Strict Nature Reserve	Agricultural pressure, deforestation, mining, poaching, weak management capacity, lack of trans-border cooperation.	1981	1992	**Still on**	13
India	Manas Wildlife Sanctuary	Insurgency-related threats resulting in destruction to park infrastructure and depletion of forest habitat and wildlife populations.	1985	1992	**Still on**	14
Ivory Coast	Comoé National Park	Conflict and political instability, poaching and uncontrolled hunting, diminishing protection, human occupation, agriculture pressure.	1983	2003	**Still on**	3
Uganda	Rwenzori Mountains National Park	Security issues: park out of the control of the management authority.	1994	1999	2004	5
Brazil	Iguaçu National Park	Illegal construction of a road through park lands.	1986	1999	2001	2
Honduras	Río Plátano Biosphere Reserve	Expansion of the agricultural frontier, illegal logging, squatting.	1982	1996	**Still on**	10
USA	Yellow-stone National Park	Tourism regulation; control of wildlife infection and transmission to domestic stock; invasive species eradication and control. Armed conflict and political instability, poaching, deforestation, encroachment by local populations and refugees, artisanal mining, uncontrolled immigration (Okapi Wildlife Reserve), expansion of illegal fisheries (Virunga National Park).	1978	1995	2003	8
DR Congo	Virunga National Park		1979	1994	**Still on**	12
DR Congo	Kahuzi-Biega		1980	1997	**Still on**	9
DR Congo	Okapi		1996	1997	**Still on**	9
DR Congo	Salonga		1984	1999	**Still on**	7

Table 4. **Relative weighting of SoCs**

Period	Weighting
1-5 years	12 pts / year: Total 60 pts
6-10 years	5 pts / year: Total 25 pts
11-15 years	3 pts / year: Total 15 pts

During its annual meeting in June/July the intergovernmental WH Committee, which carries out the business of the WH Convention, reviews the SoC reports and takes decisions on specific courses of action. Generally, the Committee requests that a State Party implement particular measures to contain or eliminate threats. The WH Committee usually then requests that a SoC report be produced for the following year's WH Committee meeting, in order to determine whether the threats have been properly managed. If a subsequent SoC report indicates that threats have been satisfactorily contained, the WH Committee then usually does not request any further SoC reports for that particular site. Alternatively, a SoC report will be requested again for the following year's meeting.

This fairly rigorous process provides the necessary data to develop an indicator of the overall level of threat intensity to which particular WH sites are being subjected. The reliability of this indicator is based on the following assumptions:

1. The WH Centre, the WH Committee and/or the IUCN are aware of all of the major conservation threats to all WH sites at all times.
2. A *standard minimum threshold of concern* is crossed before the decision to produce a SOC report is made.

4.1. Methodology

A database indicating the absence (value = 0) or presence (value = 1) of a SoC report for a WH site for each of the previous 15 years was created, starting in 1991. An overall Threat Intensity Coefficient (TIC) was calculated by applying a simple algorithm, incorporating both the frequency of SoC reports over the previous 15 years and the relative distance in time the SoC was produced. The algorithm gives an arbitrarily greater weight to more recent SoC reports, as illustrated in table 4, in an effort to reflect the estimated relevance of past SoC reports to the present value of the TIC.

Sites inscribed only within the past four years were given a distinct treatment: the algorithm gave greater weight to SoC reports on the assumption that a first SoC emanating from a very recently inscribed WH Site indicated a heightened level of concern, compared to a first SoC produced for a site that has been inscribed for several years.

Using this methodology, a TIC value can be calculated each year and the five-year weighting tranches slide forward each year. In the meantime, the value for year 15 drops off the calculation, and the values for years 5 and 10 slide into lower-weighted tranches (see samples in table 5).

4.2. Results

Of the 91 WH Forest sites, 30 have a Threat Intensity Coefficient of 0, indicating (given the assumptions noted above) that the overall threat intensity to those sites' OUVs has not surpassed the minimum standard threshold of concern in the past 15 years, or since the site was inscribed if less than 15 years ago.

Table 5. **Threat Intensity Coefficient (TIC) values from year to year, for 2 sample World Heritage Forest sites**

YR	Site	Number of SoC reports			TIC
5 yr period		**1992-1996**	**1997-2001**	**2002-2006**	
'06	E. Rennell		0	2	24
	Pirin	0	1	4	53
5 yr period		**1991-1995**	**1996-2000**	**2001-2005**	**2005**
'05	E. Rennell		0	2	24
	Pirin	1	1	5	68
5 yr period		**1990-1994**	**1995-1999**	**2000-2004**	**2004**
'04	E. Rennell		0	1	12
	Pirin	1	0	5	63
5 yr period		**1989-1993**	**1994-1998**	**1999-2003**	**2003**
'03	E. Rennell			1	12
	Pirin	1	0	4	51
5 yr period		**1988-1992**	**1993-1997**	**1998-2002**	**2002**
'02	E. Rennell			0	0
	Pirin	1	0	3	39
5 yr period		**1987-1991**	**1992-1996**	**1997-2001**	**2001**
'01	E. Rennell			0	0
	Pirin	1	0	2	27

Given the shifting value of the TIC over time, it is possible to graph it for individual sites, illustrating how it fluctuates. (See figure1 below, and Annex 2 for a complete listing)

INDICATOR 8: Average TIC Value for entire WH Forest Network

By calculating the average annual values of the TIC one should, over time, obtain an indicator of the TIC of the WH forest network overall. Chart 8 below illustrates this value from 2001 to 2006. The average TIC values during this six-year interval varied from 24.7 (2002) to 26.8 (2005); these values reflect a combination of the actual TIC values of WH forest sites, and the total number of WH Sites. This latter number increased by three in 2004-2005, and as SoC reports for newly inscribed WH sites are rarely requested, this increase has a lowering effect on the average TIC value. The actual utility of this indicator remains to be seen over time.

4.3. Discussion

The TIC provides a measure of the *current and historical intensity of threats* to the conservation of WH Site OUVs. Its ability to do so accurately is a reflection on the assumptions stated earlier. Charting the changing TIC value year after year also reveals trends in threat intensity over time: a decreasing TIC value, even with a high present value, indicates a trend towards reduced threat intensity and should convey a guardedly positive message (see figure 1 below for Pirin National Park); a site with a lower TIC for the same year, but that denotes an increase over time, demonstrates relatively new threats that show no indication of being properly addressed by the relevant WH Site management agency (see graph for East Rennell). Because TIC trends are a much better overall indicator than a single yearly value, TIC values are best represented over time and charted accordingly (again, see Annex 2 for the charted TIC values of all WH Forest sites for which the TIC for any of the past six years is greater than 0).

Limitations of the TIC:

- The TIC does not provide any information whatsoever on the nature of the threats.
- Its accuracy is dependent on the information-gathering capacity of the IUCN and WH Centre, and on their ability to establish and maintain a rigorous test of whether the level of threat surpasses a standard minimum threshold of concern.

Advantages of the TIC:

- It provides a quantitative and standardized value on the threat intensity of a WH site, allowing for comparisons over time and between sites.
- It can be applied equally to all WH sites, cultural and natural.
- It is based on information readily available to the WH Centre.
- Annual TIC values can be tabulated quickly, ensuring the sustainability of the indicator.
- It draws attention to cases where TIC values do not reflect popular conceptions of the actual SoC (as in Niokolo-Koba National Park, for instance), showing that a site may have been overlooked in the past and triggering closer monitoring on behalf of the WH Committee.

4.4. Factoring Historical Threats in Calculating the TIC

The rationale for letting SoCs up to 15 years old influence current TIC values rests on the fact that many threats to WH Forest sites are of an intractable nature (see table 4 and its description of threats to WH forest sites in danger). Such permanent, long-term or recurring threats are usually rooted in much broader, slowly evolving, macro-economic and socio-political realities over which WH site managers have little or no influence. In these circumstances, best-case conservation responses are often those where sufficient investment in management is made to

Figure 1. Sample Threat Intensity Coefficients for 2 WH Forest sites, over time

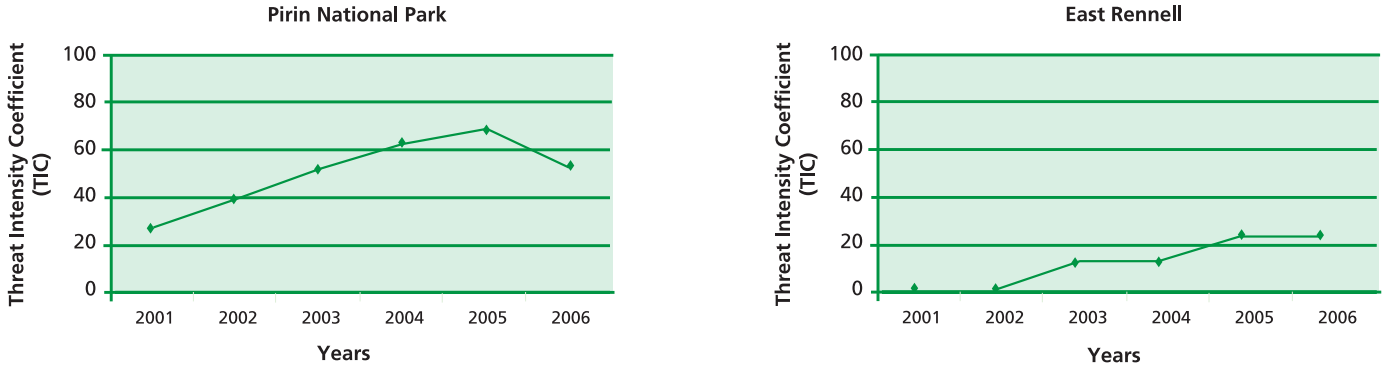
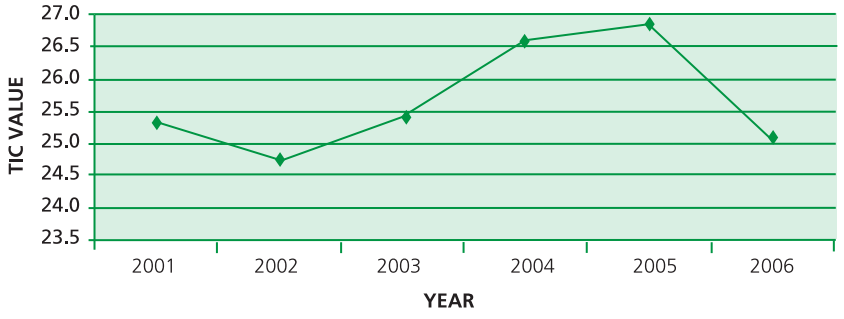


Chart 8: Average TIC Value for World Heritage Forest Network



contain the pressures arising from these deep-rooted but immediate threats. When there is a reduction in management response investment (e.g. sudden budgetary constraints, governance problems), it becomes more difficult to contain the threats. Alternatively a sudden increase in the intensity of particular threats can also overcome a previously adequate management response investment (e.g. armed conflict, refugee migration, invasion of alien species), again resulting in unacceptable impacts on the WH site. In both cases, the *standard minimum threshold of concern* would be crossed and the IUCN/WH Centre/WH Committee would produce a SoC report.

When the management response is restored to its original level, or increased to deal with the higher threat intensity, impacts on the WH sites would presumably retreat below the *threshold*, and this change would be noted by the WH Committee in its decision not to request a further SoC report for that site. Under these circumstances and though the level of a threat affecting a WH site may drop below the *threshold*, the TIC value is designed to reflect the fact that the concern threshold had been breached in the past. Thus for any site with a TIC value greater than zero, some serious threat has been detected by the WH Committee within the past 15 years; given the nature of such threats they likely remain a potential concern, even if they currently do not pose a serious challenge to the SoC of the site. If there has been no recurrence in 15 years, the methodology would interpret the threat as having been eliminated.

CONCLUSION

Given the absence of any existing framework under which a homogeneous set of indicators on the state of conservation (SoC) of WH forest sites worldwide can be constructed, it will remain extremely difficult to develop a highly reliable measure of how well WH forests are being conserved over time. Under these conditions the WH Centre must rely on indirect measures of the SoC, either on a global or regional basis using numbers and surface areas of WH forests, or on a site by site basis using the Danger listing or the Threat Intensity Coefficient.

Based on the information gathered to date, one can be generally positive regarding the state of conservation of WH forests. The average TIC values for the entire WH Forest network over the past five years have been relatively constant (ranging between 24.7 and 26.8), and the proportion of WH forest sites on the Danger List is at its lowest point since 1994; the absolute number of such sites is at its lowest since 1998.

A good deal more work can be done using and interpreting the various indicators identified in this paper. The Threat Intensity Coefficient is a first attempt at providing a quantitative value for the state of conservation of World Heritage sites, and can be replicated for all WH sites whether natural or cultural. The algorithm used to obtain TIC values was developed arbitrarily, based on the authors' overall appreciation of the dynamics and nature of State of Conservation reporting; there is undoubtedly room for further discussion and refinement. At any rate it is most important to interpret the information provided by these indicators in light of the limitations within which the latter are developed, and this caveat will apply to any indicators based on partly subjective data (as in the definition of the *standard minimum threshold*).

3

World Heritage Forests Meeting

Emerging Recommendations and the future of the Forest Programme

by Steven Ripley[1]

[1] World Heritage Centre, UNESCO, Paris.

World Heritage Forests Meeting
Emerging Recommendations and the future of the Forest Programme

Background to the meeting

The Nancy meeting had two direct outputs; these were the meeting statement and the recommendations of the three working groups. The meeting recommendations were cross-referenced with other relevant policy documents and presented to the World Heritage Committee in Durban, 2005. Based on these the World Heritage Centre then redefined the WH Forest Programme including the development of new performance indicators. These three documents are presented in the numbered sections below

I. Meeting Statement

The World Heritage List currently includes 812 of the World's most outstanding natural and cultural sites. World Heritage forests stand out from other World Heritage (WH) sites in terms of (i) higher concentrations of biodiversity, (ii) provision of essential environmental services, (iii) their contribution to poverty alleviation, and also, in many cases, (iv) greater threat from human activities.

In order to provide input to the WH Committee on how best to respond to the management challenges facing World Heritage forests, over 40 experts representing more than 20 organisations, from 10 countries convened in Nancy, France, from 9 to 11 March 2005. This event also enabled follow-up of the first such meeting, held in Berastagi, Indonesia, in 1998 which focused specifically on tropical forests. The international framework on forests and protected areas has been particularly dynamic in recent years, featuring a variety of events such as the World Summit on Sustainable Development, the IUCN World Parks Congress, the World Forestry Congress, the seventh meeting of the Conference of the Parties of the Convention on Biological Diversity, and the Third IUCN World Conservation Congress. The Nancy meeting thus also provided an opportunity for the World Heritage Centre to draw from lessons that arose from the above events as well as to contribute to the international discourse on forested protected areas.

Since the Berastagi meeting, WH-listed forests have increased by 14 million hectares (a 32 percent increase) through the addition of 18 WH sites. The WH forest network is currently comprised of 87 sites, 52 of which are tropical, 9 subtropical, 19 temperate and 7 boreal. Approximately 18 percent of the world's forests located in protected areas are WH forests; accordingly, our vision of WH forest site management is one of WH forest sites effectively integrated within the broader landscape, in accordance with the ecosystem approach of the Convention on Biological Diversity. Such an approach enables each site to be perceived in terms of linkages with its wider environment, and acknowledges that overlapping ecological, cultural, social, and economic dimensions of WH properties often lie well beyond the delineated boundaries. Applying this approach to WH sites also acknowledges that activities and development within these landscapes could impact WH site values.

The landscape or ecosystem approach has major implications, at three levels. In terms of the WH Convention itself, greater emphasis should be placed on consolidating and improving the management of existing sites. Gaps still exist in the representative coverage of the WH List of natural sites, and this issue must be addressed. However the State Parties must also ensure, with the help of partnerships with conservation NGOs and other stakeholders, that existing sites adopt and apply (i) a landscape approach (whilst bolstering conservation and management of core areas) and (ii) best management practices, to serve as models for other protected areas. The WH Convention could also benefit from linking its objectives with existing national, regional, and international agreements including the Programmes of Work on Forest Biological Diversity and Protected Areas of the Convention on Biological Diversity.

With regard to monitoring, the dynamic nature of landscapes through time means that their wider environments must be regularly monitored as part of the integrity of the sites themselves. Monitoring should also be based on the aim of improving the values of the site, including fauna, flora, and ecological processes. We remain concerned that the existing criteria for inscription of WH forest sites are not always effectively linked to indicators for monitoring their integrity. We recommend therefore that nomination forms include monitoring of those elements within the broader landscape that could have an impact on the value and integrity of the site in question.

As for stakeholders, the main objectives of WH site management must be seen in the context of broader human development aims. The extent of the wider landscape, along with its different uses and values to be conserved, should be defined in collaboration with all stakeholders. In this respect partnerships are strongly encouraged, as is a negotiation process elaborated by all parties. The participation of local populations, free exchange of information, conflict resolution, and capacity-building adapted to each stakeholder should all contribute to a positive and dynamic climate that is conducive to consensus.

Considering the urgent management capacity-building need in World Heritage forest sites, that incorporates landscape and ecosystem approaches to conservation, it is critical to strengthen and establish networks among regional and national training and research institutions and to provide adequate funding support. The creation of networks between sites of different kinds, whether linked by geographical proximity or by the nature of their designation, would also allow the sharing of experience and the flow of information, ideas, and perceptions. Channels for social connectivity with and between adjacent and linked areas must be enlarged.

Networks would be essential to the implementation of the landscape approach; last but not least, the landscape approach must also remain flexible enough to reflect the cultural, ecological, social, and economic diversity of WH sites. It is this very diversity that makes each site unique and so valuable to humankind.

A set of more detailed recommendations directed to the World Heritage Committee was adopted at the meeting; these are included later in the publication.

II. Meeting Recommendations

The principal recommendations emerging from the meeting are given below. These have been classified under the groups to which they are most relevant. The recommendations are intended to be implemented concurrently and in a collaborative manner by the various groups in order to be most effective. As such the entire set of recommendations should be considered by all of the various actors mentioned.

The recommendations have also been cross referenced with the corresponding sections of the Operational Guidelines for the implementation of the World Heritage Convention (OG), with the relevant sections of the Convention on Biological Diversity Programme Decision VII/28, taken at the seventh conference of the Parties, concerning the Programme of Work on Protected Areas (CBD – PoW PA) and with the recommendations emerging from the Vth IUCN World Parks Congress which was held in Durban 2003. Quoted sections of the OG, Decision VII/28, the CBD PoW PA and the Durban Recommendations (DR) are indicated in *italics* and referenced where appropriate with their corresponding paragraph or section number.

I. COMPLETING THE WORLD HERITAGE LIST

Recommendations

The Nancy Policy dialogue recommends that the World Heritage Committee:

1. Encourage State Parties to the World Heritage Convention to define the critical ecological support systems of a World Heritage Forest Site (WHFS), at the time of nomination of the site and monitor these as part of the overall integrity of the site itself.

⇒ The relevant sections of the operational guidelines are paragraphs 155-157 which are concerned with the statement of outstanding universal value. Regarding site integrity, where the statement of OUV does not address the site's ecological support systems and connectivity '*the Committee may also make other recommendations concerning the protection and management of the World Heritage property.*'

2. Consider that the deferral mechanism, in the nomination process, could be used more effectively by the Committee to ensure the sites long-term ecological connectivity and integration with its surrounding area has been taken into account with the nomination

⇒ In para. 160 OG concerning deferral of nominations, it states that '*the Committee may decide to defer a nomination for more in-depth assessment or study, or a substantial revision by the state party.*'

The Nancy Policy dialogue recommends that the World Heritage States Parties:

3. Recognize that for new sites, as well as those already listed, the supporting ecosystems in the landscape beyond the boundaries of the WH site must also be considered

⇒ The CBD PoW PA: *'Goal 1.2 – To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function. Target: by 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity.'*

⇒ OG para. 94 addresses the specific condition of integrity which biodiversity sites such as the majority of WH Forest sites should meet. This section gives examples of tropical forests and coral reefs and states that a property should include '*all necessary elements that are essential for the long term conservation of the ecosystems and the biological diversity they contain.*'

⇒ OG para. 90, on the statement of site integrity that should be developed for each property, addresses *'traditional societies and local communities which are consistent with the maintenance of the OUV of the area where they are ecologically sustainable.*

⇒ Paragraphs 103-107 OG deal with 'Buffer zones', '*which should include areas or attributes that are functionally important as a support to the property and its protection.*' In paragraph 106 it is also stated that *'where no buffer zone is proposed, the nomination should include a statement as to why a buffer zone is not required.'*

4. Acknowledge that when considering new nominations to the WH list approaches such as serial nominations, trans-boundary clusters or expansion of existing sites to include other ecologically connected protected areas should be given a high priority.

⇒ CBD PoW PA – '*Goal 1.3 – To establish and strengthen regional networks, transboundary protected areas and collaboration between neighbouring protected areas*

across national boundaries'. The stated target is to: *'establish and strengthen by 2010/2012 transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation'*

⇒ CBD PoW PA, Suggested activities of the Parties – '*1.2.4. State Parties develop tools of ecological connectivity, such as ecological corridors, linking together protected areas where necessary or beneficial as determined by national priorities for the conservation of biodiversity.'*

⇒ OG para. 137. Regarding serial nominations, '*include component parts related because they belong to the same biogeographic province or the same ecosystem type.'*

5. Acknowledge that forest biodiversity sites, category ix and x, (previously ii and iv), nominated before 1985 should be re-evaluated in terms of their ecological and landscape connectivity

⇒ CBD PoW PA: '*Goal 1.4 - To substantially improve site-based protected area planning and management.* Suggested activities of the Parties 1.4.4. '*As appropriate, but no later than 2010, develop or update management plans for protected areas, to better achieve the three objectives of the Convention on Biological Diversity.'* These are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

⇒ OG relevant paragraphs on site integrity 87-119.

6. Recognize that national committees and focal points at country level need to be improved and coordinated with the other biodiversity conventions and related agreements, i.e. CBD, MaB, Ramsar

⇒ Decision VII/28 - CBD CoP 7– *'27. Invites Parties, other Governments and relevant organizations to organize regional technical workshops to advance implementation of and assess the progress in implementation of the programme of work.'*

⇒ Endorse the proposal that when nominating new sites a strategic approach based on the IUCN WH list gaps analysis or other scientific assessment should be employed

⇒ Decision VII/28 - CBD CoP 7. – *'16. While 11 % of the world's land surface is currently in protected status, existing systems of PA are neither representative of the world's ecosystems, nor do they adequately address conservation of critical habitat types*.'

⇒ OG para. 56 encourages State Parties, Advisory Bodies and the Secretariat to participate in the Global Strategy for a representative, balanced and credible WH list, and reaffirms that '*Global Strategy meetings and comparative and thematic studies are organized for this purpose.'*

Recommendations

The Nancy Policy dialogue recommends that the World Heritage Centre and IUCN:

8. Recognize that the fifty natural WH sites with the least resources should be targeted for sustainable financing initiatives

⇒ The World Summit on Sustainable Development, in its Plan of Implementation, has stated that the achievement of the CBD 2010 target, to significantly reduce the current rate of biodiversity loss, requires new and additional financial and technical resources for developing countries.

⇒ Consider that the WH Centre should share and pool resources, and improve coordination with other biodiversity related conventions within the CBD framework, i.e. through identification of large scale partnership agreements.

⇒ Decision VII/28 - CBD CoP 7 – *' 26. Requests the Executive Secretary to strengthen collaboration with other organizations, institutions and conventions, with a view to supporting implementation of the activities contained in the programme of work.'*

10. Consider that a sample of existing forest sites, should be analysed for their connectivity with the landscape, including the definition of appropriate indicators for monitoring WH values, potential threats, existing or planned development activities and their impacts on WH values. A participatory approach (e.g. model forest, biosphere reserves) should then be tested for nominating a selected number of new WHFS with the participation of stakeholders representing all components of the landscape.

⇒ CBD PoW PA: *'Goal 2.2 - To enhance and secure involvement of indigenous and local communities and relevant stakeholders. Target: Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas'*

The Nancy Policy dialogue recommends that the World Heritage institutional partners

11. Encourage NGOs and other partners to attend WH Committee meetings in order to highlight issues of concern and to influence the nature conservation agenda of the Committee.

II. CONSOLIDATING WORLD HERITAGE SITES

Recommendations

The Nancy Policy dialogue recommends that the World Heritage Committee:

12. Consider using the Reactive Monitoring and In Danger listing process when plans and events outside the WH site boundaries threaten conservation of ecosystem values of the site

⇒ OG para. 180; *'The property is faced with major threats which could have deleterious effects on its inherent characteristics'* for example *'development projects within the property or so situated that the impacts threaten the property.'*

The Nancy Policy dialogue recommends that the World Heritage States Parties

13. Explore opportunities for payment for the environmental services of WH Forest sites, for example, public utilities companies on water and energy or carbon sequestration.

⇒ DR – Work with governments, civil society, and the private sector to demonstrate how World Heritage status can contribute to effective partnerships between global, national and local stakeholders to ensure environmental, economic and social benefits within and beyond the boundaries of World Heritage sites

14. Consider developing clear business plans for WH sites incorporated into national policy and landscape planning decisions

⇒ CBD PoW PA – *'Goal 1.4 – To substantially improve site-based protected area planning and management. Target: All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing on existing methodologies and a long-term management plan with active stakeholder involvement.'*

⇒ See particularly the OG paragraphs 108-119 on Management Systems and Sustainable Use.

15. Confirm that WH PAs should be models of integration into national plans, demonstrating the contribution of PAs to poverty reduction and costs, benefits, and values of ecosystem services

⇒ Decision VII/28 - CBD CoP 7: *'17. Recognizes that the inadequacy of knowledge and awareness of the threat to, and the role and value, of biodiversity, insufficient financial sustainability and support, poor governance, ineffective management and insufficient participation, pose fundamental barriers to achieving the protected areas objectives of the Convention on Biological Diversity and stresses the need for Parties to adequately address these issues*

16. Include WH sites in National planning policies, allowing the possibility of development banks or other major multilateral sponsors to become involved in their sustainable financing

Recommendations

The Nancy Policy dialogue recommends that the World Heritage Centre and IUCN:

17. Consider using the state of Conservation reporting mechanism to address broader issues where factors beyond the WHFS boundaries could impact negatively on the site

18. Develop a strong brand for natural sites to help the mission of WH, relating to high standards of management for example

19. Consider using a third party accreditation scheme for listed sites which may help to raise the bar of site management

20. Engage more of the potential donors in the wider landscape within which WHFS exist

⇒ DR: *Urge the global donor community to follow the leadership given by the UN Foundation and consider giving greater special support to World Heritage Sites in recognition of their outstanding universal value to present and future generations*

21. Prepare case studies that would help to demonstrate how WHFS can be integrated into their landscapes and contribute effectively to employment generation and poverty reduction

⇒ CBD PoW PA, Suggested activities of the Parties: *'1.2.1. Evaluate by 2006 national and sub-national experiences and lessons learned on specific efforts to integrate protected areas into broader land- and seascapes and sectoral plans and strategies such as poverty reduction strategies.'*

22. Facilitate the formation of a forum for information exchange between managers of WHFSs. This should be a learning forum as well as a source of information, challenges and case studies for use by other interested parties.

⇒ CBD PoW PA – *'Goal 2.2 - To enhance and secure involvement of indigenous and local communities and relevant stakeholders. Suggested Supporting activities of the Executive Secretary - 2.2.6 Make available to Parties case-studies, advice on best practices and other sources of information on stakeholder participation in protected areas*

The Nancy Policy dialogue recommends that other sectors and programmes of UNESCO:

23. Promote and encourage forms of management which encompass all stakeholders

24. Contribute to a broader role of identifying and consolidating partnerships

Recommendations

The Nancy Policy dialogue recommends that the institutional partners

25. Collaborate with the WH centre to maximise potential benefits arising from WH association and avoid duplication, especially amongst those partners working in WH natural sites

26. Coordinate with the WH Centre, the sources of financing going to a site, potentially avoiding duplication of effort and streamlining expenditure

27. Acknowledge that WH Partnerships at various levels are essential in supporting WH sites, for example the GEF, NGOs, Private sector, tourism and mining

28. Work towards developing strategic partnerships with the WH Centre

29. Support managers of PAs who are operating on a minimal budget and who therefore may not have sufficient resources to broaden their view to a landscape level without additional assistance

4

The Convention on Biological Diversity Ecosystem Approach: Forests and Protected Areas

by Sarat Babu Gidda[1]

[1] Secretariat of The *Convention on Biological Diversity*

Biodiversity, the variability among living things and the ecosystems that support them, is the foundation upon which human civilizations have been built. Sustaining that biodiversity in the face of considerable threat from human activities constitutes one of the greatest challenges of the modern era. The importance of this challenge was universally acknowledged at the Earth Summit in Rio de Janeiro in 1992. The *Convention on Biological Diversity* (CBD), which followed from this summit and entered into force in the next year, now has 188 Parties and reflects virtually universal participation. The objectives of the *Convention* are the conservation of biological diversity, sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

The *Convention* sets out broad commitments for Governments to take action, at the national level, for the conservation and sustainable use of biological diversity. Since its entry into force, the Parties have translated the *Convention* into a series of programmes of work. Each programme of work establishes a vision and basic principles to guide future work, identifies goals, objectives, and activities, determines potential outputs, and suggests a timetable and means for achieving these outputs. At its sixth meeting in 2002, the Conference of the Parties to the CBD developed the Strategic Plan for the *Convention*, which commits Parties to a more effective and coherent implementation of the three objectives of the *Convention*, and to the achievement by 2010 of a significant reduction of the current rate of biodiversity loss at the global, regional, and national levels as a contribution to poverty alleviation and to benefit all life on earth.

For more than a century, countries throughout the world have been setting aside areas for special protection because of their natural beauty and their repository status as spectacular concentrations of biodiversity. Protected areas are the cornerstones of in situ conservation of biological diversity, and have long been recognized as a key tool to counter the loss of the world's biodiversity. Over the last 40 years there has been a paradigm shift in the role of protected areas, from national parks and reserves to a broader conceptual and practical approach that includes sustainable use areas. Today it is recognized that protected areas contribute, besides their conservation function, to human welfare, poverty alleviation, and sustainable development. The goods and services that protected areas provide include, inter alia, protection of species and genetic diversity, maintenance of ecosystem services such as watershed and storm protection, carbon sequestration, products for livelihoods of local people, and tourism and recreation.

Globally the number of protected areas has been increasing significantly over the last decade and there are now more than 100 000 protected sites worldwide covering about 12 percent of the Earth's land surface; this makes them one of the earth's most significant land uses. However, while the number and size of protected areas have been increasing, biological diversity loss has continued unabated. The existing global system of protected areas is thus inadequate in several ways: (i) it is incomplete, and does not cover all biomes and critical species; (ii) protected areas are not fulfilling their biodiversity conservation objectives; (iii) participation of local communities in the establishment and management of protected areas is inadequate; and (iv) protected areas in developing countries are poorly funded.

THE CBD'S PROGRAMME OF WORK ON PROTECTED AREAS

The seventh meeting of the Conference of the Parties (CoP) to the Convention on Biological Diversity, using the impetus provided by the Millennium Development Goals, the Plan of Implementation of the World Summit on Sustainable Development, and the Durban Accord and Plan of Action from the Vth World Parks Congress, adopted a Programme of Work (PoW) on protected areas. The overall objective of the Programme of Work is to establish and maintain '… comprehensive, effectively managed, and ecologically representative systems of protected areas' that collectively will significantly reduce the rate of loss of global biodiversity. The Programme of Work on protected areas contains a specific set of targets and timetables, primarily organized around national-level actions. The ultimate objective is to be achieved on land by 2010 and in marine areas by 2012, with intermediate targets to be achieved by 2006 and 2008.

The Programme of Work consists of four interlinked elements, mutually reinforcing and cross-cutting in their implementation. Each programme element is structured into specific goals and/or targets, and activities. The PoW contains 16 goals, which are outcome-oriented statements of ultimate purpose. Each goal is accompanied by a target that sets a specific date by which the goal is to be accomplished, and in many cases provides indicators to measure progress towards the goal. Each paired goal and target are followed by a list of activities, which individual countries should implement in order to meet their commitments.

Programme Element 1: Direct actions for planning, selecting, establishing, strengthening, and managing protected area systems and sites.

This programme element includes establishing and strengthening national and regional systems of protected areas; the integration of protected areas into the larger landscape and seascape, and into various sectors of

planning; strengthening collaboration between countries for trans-boundary protected area conservation; improving site-based planning and management; and preventing the negative impacts of key threats to protected areas. Programme element 1 is in many ways the essence of the PoW. Taken together, the goals, targets, and activities of Programme Element 1 define the objectives, nature, and extent of the national protected area systems; the latter will ultimately constitute an effective and ecologically representative global network of national and regional protected areas systems. Achieving Goal 1.1 is an essential precondition for achieving the overall objective of the PoW, and can be done through systematic conservation planning.

Programme Element 2: Governance, participation, equity, and benefit-sharing.

This programme element includes promoting equity and benefit-sharing through increasing the value of protected areas for indigenous and local communities, and increasing the involvement of indigenous and local communities and relevant stakeholders. The central importance for protected areas of governance, participation, equity and benefit-sharing is reflected by devoting one of the four programme elements in the PoW to this set of issues. Simply stated, achieving the ultimate goal of the PoW - establishing comprehensive, ecologically representative, and effective protected area systems - requires that serious and systematic attention be paid to these socio-economic and institutional matters, and not just to biological factors and criteria.

Programme Element 3: Enabling activities.

This programme element includes providing enabling policies and institutional mechanisms; building capacity for the planning, establishment, and management of protected areas; applying appropriate technologies; ensuring financial sustainability; and strengthening communication, education, and public awareness. Programme Element 3 provides an umbrella for a number of crucial areas where action is needed to generate the resources, capacities, and public support to plan, establish, and effectively manage comprehensive, ecologically representative systems of protected areas. Achieving the goals and targets under this programme element clearly requires action by policy-makers and decision-makers in many sectors other than protected areas. Policies, laws, and resulting economic incentives in the broader economy are the responsibility of a wide range of government agencies and legislative bodies, and in many cases can only be changed with strong leadership from senior political leaders.

Programme Element 4: standards, assessment, and monitoring.

This programme element includes developing and adopting minimum standards and best practices; evaluating and improving the effectiveness of protected area management; assessing and monitoring protected area status and trends; and ensuring that scientific knowledge contributes to protected area establishment and effectiveness. Programme Element 4 addresses the need for Parties to put in place mechanisms to assess and monitor the effectiveness of their protected area systems. To do so requires a set of standards and criteria against which to measure the effectiveness of management (Goal 4.1), a system for evaluating the effectiveness of management interventions (Goal 4.2), and ongoing monitoring of status and trends of both protected areas themselves and the biodiversity they contain (Goal 4.3). In addition it is widely recognized that scientific knowledge on biodiversity needs to be improved and more widely disseminated to those responsible for protected area management (Goal 4.4). Implementing the goals under Programme Element 4 is therefore essential in order to determine whether the actions taken under Programme Elements 1-3 are actually having their intended impacts, and to allow for changes in management wherever that is not the case.

In essence, Programme Element 1 deals with what protected area systems need to conserve, and where. Programme Elements 2 and 3 address how to effectively implement protected area systems, including issues such as the policy environment, governance and participation, and capacity-building. Programme Element 4 covers the steps needed for assessing and monitoring the effectiveness of actions taken under Programme Elements 1-3.

The overall target deadline for implementation of the Programme of Work is 2010 and 2012 for terrestrial and marine areas respectively. The CoP has put forward intermediate target dates for many activities, with time-bound deadlines of either 2006/2008 or 2010/2012, in recognition of the fact that many of the goals and targets will require a phased, step-by-step approach.

The CoP made clear that fully implementing the PoW will require increased financing, including external financial assistance for developing and transitioning countries, and therefore urged Parties, other governments, and funding organizations to mobilize financial resources as a matter of urgency for implementing the Programme of Work. The CoP also called on both Parties and development agencies to integrate protected area objectives into their development strategies.

In the face of increasing human pressure on the planet's resources, an effective global protected area system is the best hope for conserving viable and representative areas of natural ecosystems, habitats, and species and achieving the 2010 biodiversity target. The PoW on protected areas is ambitious; parties to the CBD have agreed on a far-reaching program of action to establish and maintain '… comprehensive, effectively managed, and ecologically representative systems of protected areas' that, collectively, will significantly reduce the rate of global biodiversity

loss. For the first time, the global community of nations, meeting under the auspices of an inter-governmental treaty, has agreed to work together - in-country and internationally - to meet clearly defined, science-based goals for the planet's protected areas.

THE CBD'S EXPANDED PROGRAMME OF WORK ON FOREST BIOLOGICAL DIVERSITY

Together, tropical, temperate, and boreal forests offer diverse habitats for plants, animals, and micro-organisms, and constitute a large percentage of the world's terrestrial species. Forest biological diversity provides a wide array of goods and services, from timber and non-timber forest resources to an important role in purifying, recycling, and storing water and mitigating climate change. At the same time, this diversity provides livelihoods for hundreds of millions of people worldwide. Forest biological diversity plays a particularly important economic, social, and cultural role in the lives of many indigenous and local communities.

The Conference of Parties to the CBD in its sixth meeting adopted an elaborate programme of work on forest biological diversity. This programme includes a broad set of goals, objectives, and activities aimed at the conservation of forest biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from the utilization of forest genetic resources. The programme of work consists of three elements. The first element covers largely biophysical aspects, such as the reduction of threats to forest biological diversity through restoration, agro-forestry, and watershed management, and the establishment of protected areas. The second element deals with the institutional and socio-economic environment that enables the conservation and sustainable use of forest biological diversity. The third element covers assessment and monitoring. Together, these elements and the goals and activities contained therein are designed to address the main causes of forest biological diversity loss.

THE CBD'S ECOSYSTEM APPROACH

The processes linking ecosystems and species are complex, and an action taken in one location may have unforeseen consequences elsewhere, often far away and many years later. In this context, the ecosystem approach offers a powerful strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the *Convention*. The approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential processes, functions, and interactions among organisms and their environment. It recognizes that humans and their cultural diversity are an integral component of ecosystems.

The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often nonlinear, and the outcome of such processes often shows time lags. The result is discontinuities, leading to unforeseen outcomes and significant uncertainty. As such, management must be adaptive in order to be able to respond to these uncertainties. The ecosystem approach does not preclude other management and conservation approaches, and may be in fact consistent and compatible with them. Some notable complimentary approaches include ecosystem-based management, integrated marine and costal management, integrated river basin management, and responsible fisheries. These approaches may support the implementation of the ecosystem approach in various sectors.

Even though the ecosystem approach is a central concept to the Convention, it has proven difficult to define in a simple manner. The fifth meeting of the Conference of the Parties endorsed a description of the ecosystem approach and a five-point operational guide. It also recommended the application of 12 'principles of the ecosystem approach'. Although defining the ecosystem approach has not been easy, many Governments and organizations are already implementing it. Case studies have proven a valuable source of information on the success and failures of the practical application of the ecosystem approach. The CoP has placed much emphasis on the collection and analysis of case studies, some of which are available from the *Convention*'s website (referenced in this publication). A web-based source book currently under development at the request of the seventh meeting of the CoP will also incorporate a searchable, case-study database.

THE ECOSYSTEM APPROACH AND SUSTAINABLE FOREST MANAGEMENT

Since 2002 research organizations, governments, and relevant intergovernmental bodies have carried out a number of analytical studies aimed at comparing the ecosystem approach and the concept of sustainable forest management. These studies served as further input for a global assessment of sustainable forest management and ecosystem approaches, undertaken between 2004 and 2005. One of the main findings of this pioneering effort is that the principles of the ecosystem approach have helped to catalyse the reform of sustainable forest management practices towards a more holistic, human-centred activity that is less commodity-oriented and includes other benefits and services provided by forest ecosystems.

The assessment also reveals the need for further strengthening of the institutional and human capacity for implementing adaptive management; for facilitating dialogue among all forest stakeholders; and for enhancing the effectiveness of payments for environmental services in

supporting the productive function of the world's forests (website:http://www.biodiv.org/programmes/cross-cutting/ecosystem/cs.aspx).

5

The United Nations Forum on Forests and the *World Heritage Convention*

by Michel Laverdière [1]

[1] United Nations Forum on Forests

The United Nations Forum on Forests and the World Heritage Convention

In March 2005 the United Nations Forum on Forests (UNFF) Secretariat participated in the UNESCO meeting, 'World Heritage Forests - Leveraging Conservation at the Landscape Level', held in Nancy, France. The UN Forum on Forests Secretariat welcomes the initiatives of UNESCO on the management of forest and nature reserves, and supports UNESCO in this endeavour of great significance. The following pages highlight the Forum's objectives and approaches, as well as its engagement with the issues of landscape management and forest reserves.

The world has nearly four billion hectares of forests, covering 30 percent of the Earth's land area, and everyone depends to varying degrees on forests for their livelihood. Forests provide subsistence and income to about 350 million people who live in or near them; forests are the largest reservoir of terrestrial biological diversity, providing habitat for a large number of plant and animal species; and forests act as regulators of climate and water cycles, and as spaces for the cultural and spiritual well-being of human civilization.

However in many parts of the world, forests are in crisis. Alarming, unabated rates of deforestation and forest degradation have resulted in many environmental, economic, and social disasters on scales from local to global. Land erosion, drought, food insecurity, displacement of human settlements, and loss of livelihoods are often attributed or linked to mismanagement and loss of forest resources. Coupled with these problems are the risks of irreversibly damaging the planet's life support system as a whole, and of losing many known and unknown benefits. On the other hand, responsibly managed forests have significant potential to contribute to economic development and social well-being without compromising environmental integrity. These contributions directly address the eight Millennium Development Goals, in particular those related to alleviating poverty and ensuring environmental stability.

Wangari Maathai speaks at UNFF, May 2005

In the words of UNFF guest speaker Nobel Laureate Wangari Maathai (Kenya) '… the foundations of a secure state are a sustainably managed environment, democracy, and a culture of peace'. Ms. Maathai also emphasized the importance of environmental education.

These issues and the potential of forests have galvanized the international community into action in combating deforestation and promoting sustainable forest management – this as a collective responsibility. As a result, in 2000 the Economic and Social Council of the UN established the United Nations Forum on Forests with the main objectives of promoting the management, conservation, and sustainable development of all types of forests and of strengthening long-term political commitment to this end. The establishment of the UN Forum on Forests was preceded by an understanding developed at UNCED in 1992, and its comprehensive policy discussions on issues related to conservation, management, and sustainable development of all types of forests through the *ad hoc* Intergovernmental Panel on Forests (IPF) and the *ad hoc* Intergovernmental Forum on Forests (IFF). Those discussions resulted in a global agenda on forests, known as the IPF/IFF proposals for action. One of the issues addressed in these proposals for action is forest conservation and protected areas. The member States agreed to the establishment of networks of protected forest areas; the development of partnerships among stakeholders; and international cooperation on financial assistance and the transfer of environmentally sound technologies.

The UN Forum on Forests fosters the promotion of sustainable forest management through the implementation of those proposals for action, periodic review of implementation, international cooperation, stakeholder participation, and the exchange of experiences among member States and relevant organizations.

At its second session in 2002, the Forum reviewed progress in implementing the IPF/IFF proposals for action related to forest conservation and protected areas. Countries were urged to strengthen linkages between science and policy, including by developing criteria and indicators, integrating them into national forest conservation programs, and applying them at the landscape level. The Forum also encouraged countries to explore options to decentralize decision-making, and underscored the need for flexibility in responding to local situations; furthermore it encouraged countries to develop ways and means of sharing experiences.

Member States of the Forum can collaborate more on issues related to governance at the landscape level; they can also work on strengthening institutional capacity for governance, including participatory approaches, and on improving education on conservation issues. Opportunities also exist to better use the results of research, and to facilitate the appropriation of science at the landscape level for the improvement of management practices.

The World Heritage Forests Programme of UNESCO has a wealth of experience in forest reserve management at the local and national levels. It is important that this experience and knowledge be shared with individual countries and the international community as a whole in order to

facilitate better understanding and policy formulation. It would be highly advisable that UNESCO consider sharing its experience and knowledge with the Forum at its sessions. Synergy and cooperation between the two UN bodies committed to the sustainable management of forest resources is possible as well as desirable.

The sixth session of the Forum will be held in February 2006 in New York. At this session the member States will complete the review of the effectiveness of the Forum's work, and chart out its future direction. Countries will have the opportunity to strengthen their commitment to the sustainable management of forests and to show vision, leadership, and determination. It is anticipated that in the new phase of the Forum's work programme, adequate political attention and commitment will be directed to conservation and protected areas at the landscape level.

6

How Useful is the Landscape Approach?

by Benjamin Singer[1]

[1] Science Po/ *Centre de Cooperation Internationale en Recherche Agronomique pour Développement* (CIRAD)

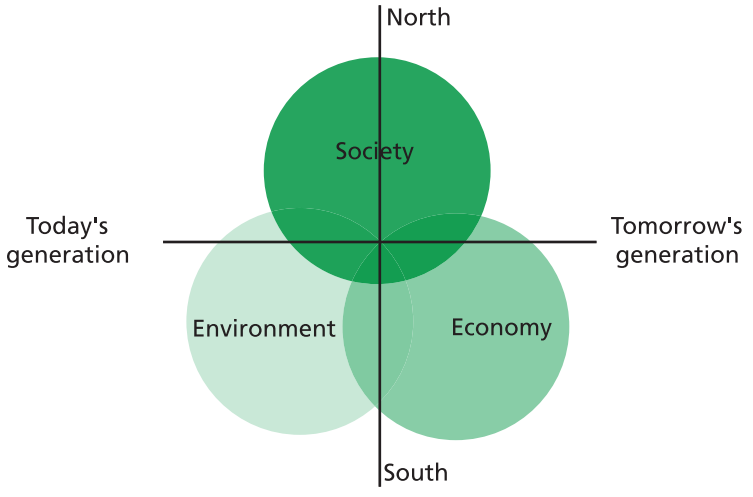
The landscape approach has been heralded as the dawn of a new era in nature conservation, a paradigm shift that enables stakeholders to come together in order to better understand and preserve their environment. Initially championed by a handful of organisations, it is now widely used in conservation circles. This paper casts a new light on the landscape approach from a social science perspective; in particular, it aims to offer a more rigorous definition and understanding of the reasons for the political significance and popularity of the concept. This paper also identifies a number of implications that need to be taken into account if the landscape approach is to be applied effectively to forest conservation.

TOWARDS A NEW DEFINITION

As is the case with many widely-used expressions, the 'landscape approach' is subject to a wide range of definitions and its relation to similar notions such as 'sustainable development' and the 'ecosystem approach' remain unclear. In order to avoid the common pitfall of ambiguity, it is essential to generate a clear and precise definition of what is understood as a 'landscape'. Within the field of political science, Giovanni Sartori emerges as one of the most quoted authorities in concept analysis. In order to define a term with '… a modicum of discipline', Sartori (1984) recommends that a list of definitions be drawn up from the existing literature (as shown in Table 1 below) and a set of common characteristics extracted. This set will constitute the meaning which can be expressed in a new definition.

Table 1. **List of definitions of 'landscape', 'ecosystem approach', and 'sustainable development' from the literature on environmental management**

No.	Expression	Definition	Source
1	Landscape	'A contiguous area, intermediate in size between an "eco-region" and a "site", with a specific set of ecological, cultural and socio-economic characteristics distinct from its neighbours.'	Dudley (2002)
2	Landscape	'Landscape is an interface between nature and culture, the consequence of human presence in the natural environment and the imprint of the natural environment on the culture and way of life of its residents, past and present. The landscape contains important evidence of past relationships with the land as well as present uses. Landscapes are central to a sense of identity, a sense of place.'	Lucas (1992)
3	Landscape	'The interaction between people and nature … is at the core of the idea of landscape. Landscape, defined in these terms, has certain distinctive characteristics: • it contains both natural and cultural values and features, and focuses on the relationship between these; • it is both physical and metaphysical, with social, cultural and artistic associations. While landscape is how we see the world, it is thus much more than mere scenery and appearance. We take it in all our senses; • while we can experience landscape only in the present, it is the sum of all past changes to the environment: it is where past and present meet; • landscape is universal - it exists throughout the country; • and landscape gives identity to place, and hence diversity to the settings of our lives.'	Phillips (1999b)
4	Protected Landscape/ Seascape	'Protected 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.'	IUCN (1994)
5	Cultural Landscape	'Cultural landscapes are cultural properties and represent the "combined works of nature and man" designated in Article 1 of the Convention. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.'	World Heritage Centre (2005)

No.	Expression	Definition	Source
6	Sustainable Development[2]		Swiss Federal Office for Sustainable Development (2005)
7	Ecosystem Approach	'The ecosystem approach is a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention [on Biological Diversity: conservation, sustainable use, and fair and equitable sharing of benefits]. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions, and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems.'	Secretariat of the CBD (2005)

From this list of definitions, one can extract the following characteristics, displayed subsequently in Figure 1:

- The *interrelation between humans and nature*, along with the presence of social and natural factors, appears to be the core characteristic shared by all definitions and the common element to both the sustainable development and ecosystem approaches (definitions 1 to 7).
- *High (natural and cultural) value* also seems to be a salient feature of landscapes as in definitions 3 and 4.
- The importance of *past and present events* is also mentioned several times (definitions 3 and 5).
- Several authors point out a *contiguous geographical area* (definitions 1 and 4).
- The idea of *identity* or *distinctness* arises in three definitions (definitions 1 to 4).
- Finally, definition 3 points out that the idea of a landscape is *universally applicable*.

One may therefore use these retained characteristics to offer a new definition of the landscape approach:

> *The landscape approach in nature conservation may be defined as an analytical and/or normative perspective that is based on the interaction between people and nature. It explores the relationships between past and present natural and social processes that contribute to shape a contiguous area of high social, biological, and/or aesthetic value. This approach is universally applicable yet emphasises the identity of each landscape through the unique configuration of the processes involved.*

[2] Most authors use the Brundtland Report (1987) definition: 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. However, the diagram above

This definition represents a compilation of many other definitions found in the literature in that it retains the concept's main characteristics illustrated in Figure 1. The landscape approach is defined as either analytical or normative because it can be used as a basic assumption (i) to understand and analyse relationships between different processes that shape an environment, or (ii) as a principle underpinning the management of a particular area.

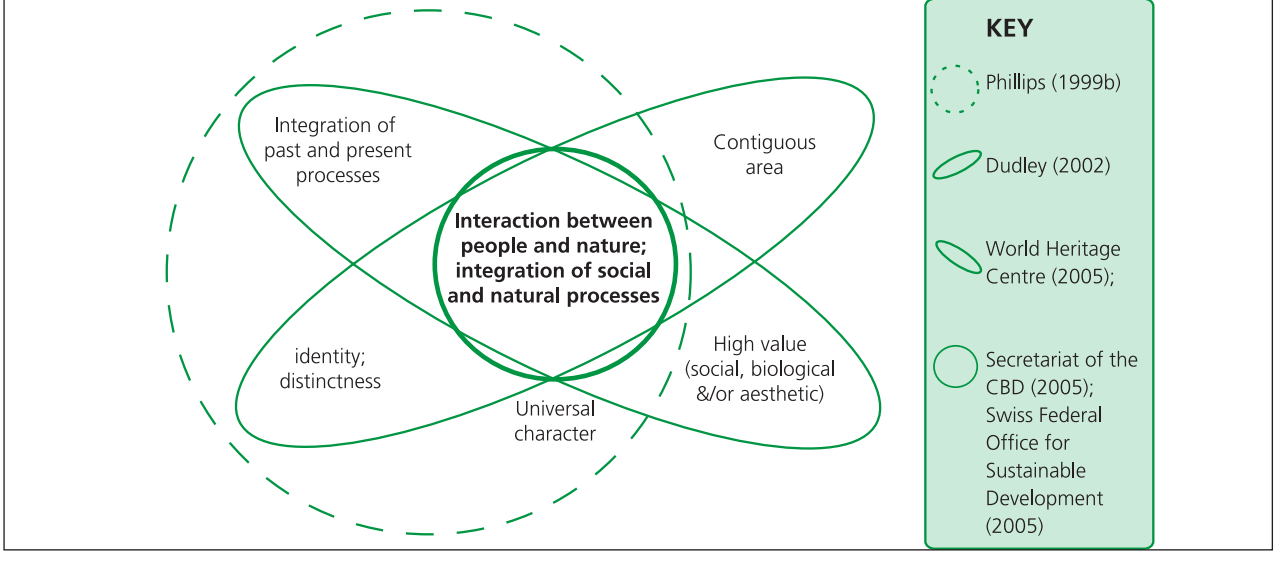
The above definition also acts as a starting point for subsequent discussion in that it reveals the strengths and weaknesses of the concept. On the one hand its main strength lies in its core characteristic, which it shares with the concepts of 'sustainable development' and the 'ecosystem approach'; as shown in the next section, this notion has underpinned the political popularity of the landscape approach as a uniting, universally applicable principle. On the other hand and as discussed in the last section, there are inherent weaknesses in four characteristics (integration of social and natural processes, contiguous area, high value, and integration of past and present processes); their lack of precision has consequences for the practical application of the concept.

THE POLITICAL SUCCESS OF THE LANDSCAPE APPROACH

From the then controversial creation of the IUCN's 'Protected Landscape' category in 1978 to the World Parks Congress held in Durban in 2003, the landscape approach has enjoyed a considerable growth in popularity. Key to explaining this success is the core characteristic that it shares with the concepts of sustainable development and the ecosystem approach, namely the interaction between people and nature. This characteristic is fundamental in understanding the recent history of conservation. In the 1980s and 1990s, this discipline underwent a paradigm shift (see Box 1) in terms of the perception of the relationship between 'Man' and 'Nature'. Ever since the creation of the world's first modern-day protected areas[3], their management was based on the notion of a 'pristine wilderness' and on the dichotomic, mutually exclusive relationship between humans and their natural environment. Throughout the Twentieth Century, it was believed that humans could only damage nature; in order to protect it, humans activities needed to be suppressed.

This management paradigm led to what has been described as 'fortress conservation', where geographical areas identified as either aesthetically pleasing or significant to the survival of a set of particular species were fenced off from their surroundings. In many cases, decisions to isolate these 'hands-off', 'no-go' areas from the rest of the region were conducive to considerable conflict. Such decisions were often resented by local populations, who saw the 'protection' of areas as a cutting off of their livelihoods and their reliance on what they considered as their environment. During the 1980s and 1990s, however, the underlying notion of conflict between human activities and nature was turned on its head: as biologists roamed what were once considered 'pristine' areas, it became increasingly obvious that no area on the surface of the earth remained completely untouched by humans. In other words, the areas valuable to conservationists were the product not only of natural processes but also of human ones. The relationship between humans and their environment began to appear more synergistic than conflictual.

Figure 1. **Principal characteristics of the terms 'landscape', 'sustainable development', and 'ecosystem approach' according to different definitions**



[3] Phillips (1999) defines a protected area as '… 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.'

The principle that epitomises this paradigm shift is that of sustainable development. Coined in 1987 in the Brundtland Report, it came to the forefront in discussions at the United Nations Conference on the Environment and Development in Rio in 1992 and was the subject of the 2002 World Summit in Johannesburg. This principle, based on the idea of a conciliation between human development and nature conservation, has rallied virtually all environmental and development organisations since the 1990s.

Box 1. The Landscape Approach as a Paradigm Shift in Conservation

In his book on scientific revolutions, Kuhn (1962) challenges the view that sciences witness a gradual, incremental accumulation of knowledge. Instead he suggests that every scientific discipline is home to a number of paradigms, or 'accepted models or patterns' that shape the way scientists collectively see the world. However every so often, discrepancies appear between the paradigm and empirical observation such that the former can no longer explain the latter; the scientific community then starts searching for a new paradigm.

The concept of paradigms has successfully been imported into political science and economy to explain why different actors see things differently and why certain types of behaviour are considered legitimate at a certain period in time whilst others are not.

Political scientists such as Surel (1995) have operationalised the concept by identifying four fundamental components to each paradigm:

- *General metaphysical principles: this is the most fundamental and abstract component of a paradigm, as it refers to people's 'view of the world'. It characterises the conceptual framework which underpins the behaviour of actors.*
- *Hypotheses and laws: axioms, theories of action, and types of reasoning that build the bridge between metaphysical principles and behaviour; these are normative in nature.*
- *Methodology: the nature of the relationships between different actors that are considered most appropriate (coercion, consultation, negotiation, mediation).*
- *Instruments and tools: political elements used in public policy and legislation to translate principles into action, and incite or coerce actors into behaving in a certain way (i.e. a law, an institution, etc.).*

This concept can easily be applied to the field of nature conservation. By the 1980s, it became obvious that the 'fortress' approach was unsuccessful; scientists and conservationists alike increasingly realised that areas previously considered 'pristine' were in fact partly shaped by human activities. These observations, highlighting fundamental flaws in the fortress approach, triggered a paradigm shift towards the 'landscape approach'. The components of each paradigm are shown in Table 2.

Table 2. **Breakdown of the fortress and landscape approach paradigms in nature conservation**

Components	'Fortress' Conservation	Landscape Approach
General metaphysical principles	Conflict between humans and nature	Synergy between humans and nature
Hypotheses and laws	Humans can only damage nature and need to be excluded when protecting natural environments.	Humans can contribute to enhancing natural environments and should be included in managing nature.
Methodology	Biologists and conservationists as the only legitimate stewards of natural environments; other stakeholders are excluded.	All stakeholders are considered legitimate stewards of natural environments; consultation and negotiation are strongly encouraged.
Instruments and tools	Isolation of protected areas from their environment; management focused on preserving certain species or habitats.	Studying and emphasising the links between (i) a site and its surroundings and (ii) natural and social processes which shape the environment; participation of all stakeholders.

Thanks to their similarity in meaning, the landscape approach has largely benefited from the political success of the concept of sustainable development. In this respect it can be perceived as the application of sustainable development to the management of protected areas, as it encourages exploration of the relationship between humans and nature within a geographically contiguous area. This probably explains why the landscape approach has been particularly popular among those whose main management tool is protected areas, namely conservationists: so far, the concept has indeed remained within conservation circles (mainly IUCN, the Convention on Biological Diversity, Conferences of the Parties, the World Heritage Centre, and WWF).

THE CHALLENGES AHEAD

Many authors refer to the landscape approach with great optimism, such as Phillips (1999b), who welcomes the new paradigm as a '… vision for the future'. However, the application of this concept remains fraught with difficulties, both (i) inherent to its definition and (ii) related to its political dimensions. The difficulties linked to the definition of the concept lie in what Sartori (1984) calls boundlessness, *i.e.* the fact that the characteristics listed do not allow one to discriminate precisely between which of the approaches 'out there' is a landscape approach and which is not[4]. Four of the six characteristics listed in Figure 1 contribute to the concept's boundlessness:

- *Integration of social and natural processes*. If one were to be meticulous, it would not be possible to identify *all* the processes which shape a particular environment. For example, the majority of tropical forests are shaped by obvious processes such as vegetation regeneration or local foraging traditions; however, global oceanic patterns and demand for traditional produce also shape forested landscapes in less clear ways. In fact, the butterfly's wing effect ensures that the world's landscapes are all connected to each other in some way or another, but in most cases these types of connectivity are negligible. However the cut-off point, or threshold[5], above which one can consider a process to have a significant effect, is largely fixed arbitrarily.
- A landscape is also defined as a *contiguous area* whose boundaries would logically be determined by the geographical extent of the processes shaping the landscape. Therefore, landscape boundaries will depend on the threshold mentioned above. It would appear sensible to include nearby villages in a forest's landscape since their livelihoods depend upon it, but how far into the ocean should one extend the landscape that crucially relies on warm sea currents for heavy rainfall?
- *High value*. Many landscape definitions include this characteristic, including that of the World Heritage Convention which refers to sites of 'outstanding universal value'. This should supposedly discriminate between processes which are to be enhanced (e.g. vegetation regeneration or collecting non-timber forest products) and those to be minimised (e.g. logging or agricultural encroachment). However, value is the essence of subjectivity and since the landscape approach encourages the participation of all stakeholders it may turn out to be extremely difficult to reach agreement; 'value' varies considerably across social and cultural backgrounds.
- *Integration of past and present processes*. Some definitions of a landscape, such as that offered by the World Heritage Centre (2005), point out that it is evolving. This appears to contradict the generally accepted idea that valuable landscapes are timeless, as illustrated by the idea of 'harmony' between social and natural processes. In this case, does the value of a landscape also evolve over time? More importantly, are we valuing certain types of landscapes and processes simply because they belong to the past rather than the present?

For example, indigenous Amazonian communities are often perceived as the epitome of timeless harmony between humans and nature. However, many of these societies are increasingly integrated into the margins of national economies, thus shifting their livelihoods from nomadic hunting and foraging to settled agriculture and animal husbandry. The indigenous people themselves often welcome these changes as 'development' and in some ways manage to enhance their natural environment by creating a mosaic of different vegetation types. However, many conservationists are appalled to see the 'primary rainforest' affected. Should conservationists go against the will of these populations, and prevent these livelihood changes on the grounds that they want to preserve what *they* view as timeless harmony?

The four above difficulties, inherent to the concept's definition, show how fundamental yet arbitrary the selection criteria can be within the landscape approach. These criteria - (i) degree of impact, (ii) natural, cultural, and aesthetic value, and (iii) temporality - will to a great extent define how the landscape approach is to be applied to a specific environment.

Two political dimensions of the landscape approach provide further challenges to the operationalisation of the concept. First and against the claims made by certain authors (such as Phillips, 1999a and 1999b), the paradigm shift described above remains incomplete. Despite the fact that conservationists now acknowledge the inextricable links between humans and nature and recognise that the border between the two is more blurred than was once thought, recent literature shows that many conservationists still think in human/nature dichotomic terms. For

[4] In Sartori's terms, boundlessness means that the relationship between meaning and referent is unclear.

[5] The use of the term 'threshold' assumes that the impact of a process on a landscape can be quantified; however, in many cases the influence of a process on the environment is qualitative, which adds further complexity to the notion of a cut-off point which would discriminate between 'important' and 'negligible' processes.

instance despite having adopted the landscape approach, many authors carry on referring to 'human disturbance', 'interference', or 'wilderness', thus harking back to the vision of humans and nature as mutually exclusive. Even the term 'integrity', central to the World Heritage Convention, is somewhat questionable since it is defined as '… a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes' (World Heritage Centre, 2005: 22). The landscape approach as a new paradigm and the human/nature dichotomy are not necessarily mutually exclusive. The dichotomy may be used as a heuristic model to better understand relations between processes of different kinds; but it should always be borne in mind that it should remain a model, a simplification of reality which does not in and of itself emphasise the importance of connectivity between processes.

The second political dimension is related to the first. The landscape approach has been adopted by conservation organisations only, and has yet to cross the bridge that divides conservation and development. This can have serious consequences on the application of the concept. The landscape approach requires participation of all stakeholders - not only conservationists, and so the concept needs to be understood and used by all actors involved in shaping a particular landscape. This restriction to conservationists also explains why most authors continue to consider the landscape approach as a tool for protected area management, rather than considering protected areas as an element of the landscape approach. The first configuration (applying the landscape approach to protected area management) contains a logical fallacy: it involves exploring the interrelation between humans and nature as a means of preserving only natural outcomes. Moreover, it would amount to considering a protected area as an outcome in itself rather than a tool. In short, it represents an incomplete paradigm shift because while the instrument changes (fortress to landscape), the outcome (the protected area) remains identical.

On the other hand, protected areas play a paradoxical yet crucial role in applying the landscape approach to a particular environment. At first sight, protected areas epitomise 'fortress conservation' in that they involve preserving natural processes from (usually) man-made threats. However, even when using the landscape approach one needs to recognise that not all processes are necessarily 'harmonious': clear-felling as a socio-economic process threatens forest regeneration as a natural process. Protected areas thus help to geographically hem in certain processes (such as logging) so as to protect others (such as forest regeneration), which in turn may have a 'harmonious' relationship with social processes such as the collection of non-timber forest products. This perspective allows us to see protected areas as a tool that helps preserve the synergy between human and natural processes, the resulting landscape being its outcome. In this sense, 'fortress conservation' and the landscape approach can actually go hand in hand. Protected areas managed using a 'fortress' approach (creation of integral reserves that exclude human activities from particularly vulnerable or threatened ecosystems) can be integrated within a larger landscape, where human activities are taken into account but defined geographically.

CONCLUSION

As numerous as they may appear, these challenges are far from insurmountable. The degree of arbitrariness related to the boundlessness of the definition can be solved through negotiations; stakeholders can reach a consensus on thresholds to be fixed, temporalities to be set, and values to be adopted. Stakeholder participation is a costly and lengthy process, but the recent political success of the landscape approach is an encouraging step in the right direction. Yet there remains a real danger in ignoring the difficulties involved in applying the landscape approach: the concept could end up on the already large pile of meaningless buzzwords that have fallen out of fashion.

7

The 'Forest Landscape Approach': Lessons Learnt from World Heritage Cultural Landscapes and Beyond

by Mechtild Rössler[1]

[1] UNESCO-World Heritage Centre

The 'Forest Landscape Approach': Lessons Learnt from World Heritage Cultural Landscapes and Beyond

'A culture is not better than its woods' - W.D. Auden

ABSTRACT

This paper looks at new approaches and practices (post-1992) in the context of the UNESCO World Heritage Convention, which with 180 States Parties is the most universal international legal instrument in heritage conservation. In 1992 the concept of cultural landscapes was introduced in the *Operational Guidelines for the Implementation of the World Heritage Convention,* **and the notion of 'integrity' was enlarged. Since February 2005 the notion has also been applied to cultural properties, many of which are protected areas: 50 official cultural landscapes inscribed on the World Heritage List focus on the outstanding interaction between people and their environment. This article reviews key case studies from World Heritage sites, by theme: (a) natural properties where the landscape approach was used in conservation issues focusing on forest areas; (b) forest cultural landscapes and integrity issues; and (c) the broader linkages in the landscape approach, including natural and cultural properties, and using the results of the 'Linkages in the Landscape' stream at the 2003 World Parks Congress.**

INTRODUCTION

The *Convention Concerning the Protection of the World Cultural and Natural Heritage* (World Heritage Convention), adopted by the General Conference of UNESCO in 1972, established a unique international instrument that recognizes and protects both the cultural and natural heritage of outstanding universal value. 'Natural heritage' encompasses outstanding physical, biological, and geological formations, habitats of threatened species, and areas with scientific conservation or aesthetic value, whereas 'cultural heritage' is defined as monuments, groups of buildings, or sites with historical, aesthetic, archaeological, scientific, ethnological, or anthropological value (Articles 1 and 2 of the *Convention*). The *Convention*'s definition of 'heritage' provided an innovative opportunity for the protection of sites linking natural and cultural elements (or 'tangible' and 'intangible' heritage), and for the conception of cultural landscapes as '… works of man or the combined works of nature and man'. Today the Convention covers 788 sites (154 natural, 611 cultural, and 23 mixed properties) in 134 countries; 50 of the 788 sites are recognized as cultural landscapes. The *Convention* not only links the protection of cultural and natural heritage, of cultural and biological diversity; it also links people with protected areas, and the 'tangible' with the 'intangible'.

INTEGRITY

In implementing the *Convention*, the Committee has developed criteria and conditions for the inscription of properties on the World Heritage List. The main document that reflects the evolving practice of the *Convention* is the set of *Operational Guidelines for the Implementation of the World Heritage Convention*. This document, which has been revised many times to reflect new concepts, knowledge, or experiences, contained until 2005 a 'test of authenticity' (for cultural properties) and 'conditions of integrity' (for natural properties), to be applied in the evaluation of nominees for the List.

As early as 1977, the first Operational Guidelines indicated that for natural properties, sites should also meet the conditions of integrity and should include '… key interrelated and interdependent elements in their natural relationships'; '… should have sufficient size and contain the necessary elements to demonstrate the key aspects of the process and to be self-perpetuating'; and '… should contain those ecosystem components required for the continuity of the species or of the objects to be conserved' or '… should be of sufficient size and contain the necessary habitat requirements for the survival of the species', depending on the criteria for which they were nominated. Over the years these 'conditions of integrity' have been further elaborated, together with the four natural heritage criteria.

A radical, twofold change to the Operational Guidelines occurred in 1992:

- The natural heritage criteria were changed, and conditions of integrity were adapted accordingly.
- The cultural criteria were slightly changed to accommodate cultural landscapes, and categories of cultural landscapes were introduced.

The changes are illustrated below in Tables 1 and 2:

In addition to the conditions of integrity directly linked with each of the four natural criteria, the following general conditions are also applied:

- The sites should have a management plan. The State Party should also provide other document(s), such as operational plans, which will guide the management of the site until such time that a management plan is finalized.
- The sites should have adequate long-term legislative, regulatory, institutional or traditional protection. The boundaries of the site should reflect the spatial requirements of habitats, species, processes, or phenomena that provide the basis for its nomination for inscription on the World Heritage List. They should also include sufficient areas immediately adjacent to the area of outstanding universal value, in order to protect the site's heritage value from direct effects of human encroachment and impacts of resource use outside of the nominated area. The boundaries may coincide with one or more existing or proposed protected areas, such as national parks or biosphere reserves. While an existing or proposed protected area may contain several

Table 1. **Natural heritage criteria and conditions of integrity, 1992-2004**

Natural Criteria (44a)	Conditions of Integrity (44b)
i. … be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features; or	**i**. The sites described … should contain all or most of the key interrelated and interdependent elements in their natural relationships; for example, an 'ice age' area should include the snow field, the glacier itself and samples of cutting patterns, deposition and colonization (striations, moraines, pioneer stages of plant succession, etc.); in the case of volcanoes, the magmatic series should be complete and all or most of the varieties of effusive rocks and types of eruptions be represented.
ii. … be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal, and marine ecosystems and communities of plants and animals; or	**ii**. The sites described … should have sufficient size and contain the necessary elements to demonstrate the key aspects of processes that are essential for the long-term conservation of the ecosystems and the biological diversity they contain; for example, an area of tropical rainforest should include a certain amount of variation in elevation above sea level, changes in topography and soil types, patch systems and naturally regenerating patches; similarly a coral reef should include, for example, sea grass, mangrove, or other adjacent ecosystems that regulate nutrient and sediment inputs into the reef.
iii. … contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; or	**iii**. The sites described … should be of outstanding aesthetic value and include areas that are essential for maintaining the beauty of the site; for example, a site whose scenic values depend on a waterfall, should include adjacent catchment and downstream areas that are integrally linked to the maintenance of the aesthetic qualities of the site.
iv. … contain the most important and significant natural habitats for in situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation;	**iv**. The sites described … should contain habitats for maintaining the most diverse fauna and flora characteristic of the biographic province and ecosystems under consideration; for example, a tropical savannah should include a complete assemblage of co-evolved herbivores and plants; an island ecosystem should include habitats for maintaining endemic biota; a site containing wide-ranging species should be large enough to include the most critical habitats essential to ensure the survival of viable populations of those species; for an area containing migratory species, seasonal breeding and nesting sites and migratory routes, wherever they are located, should be adequately protected; international conventions, e.g. the *Convention* of Wetlands of International Importance Especially as Waterfowl Habitat (the RAMSAR *Convention*) for ensuring the protection of habitats of migratory species of waterfowl, and other multi- and bilateral agreements, could provide this assurance. **vii**. Sites described … should be the most important sites for the conservation of biological diversity. Biological diversity, according to the new global *Convention on Biological Diversity*, means the variability among living organisms in terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and includes diversity within species, between species, and of ecosystems. Only those sites which are the most biologically diverse are likely to meet criterion (iv)...

management zones, only some of those zones may satisfy the nomination criteria; other zones, although they may not meet the criteria, may be essential for the management to ensure the integrity of the nominated site. For example, in the case of a biosphere reserve only the core zone may meet the criteria and conditions of integrity necessary for World Heritage listing, although other zones such as buffer and transitional zones would be important for the conservation of the biosphere reserve in its totality.

The critical change in 1992, which is relevant to the notion of integrity, was the deletion of '… man's interaction with his natural environment' from natural criterion (ii) and that of '… exceptional combinations of natural and cultural elements' from criterion (iii).

The second main change adopted by the World Heritage Committee in 1992 was the introduction of cultural landscapes into the Operational Guidelines, to be evaluated under cultural criteria as 'cultural heritage', and following the changes to the natural criteria as described above.

Table 2. **Changes to natural heritage criteria (ii) and (iii)**

CRITERION	1980-1992	1992-1999
ii.	… be outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment; as distinct from the periods of the earth's development, this focuses upon ongoing processes in the development of communities, of plants and animals, landforms, and marine and fresh water bodies.	… be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal, and marine ecosystems and communities of plants and animals.
iii.	… contain superlative natural phenomena, formations or features, for instance, outstanding examples of the most important ecosystems, areas of exceptional natural beauty or exceptional combinations of natural and cultural elements.	… contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.

Table 3. **Cultural heritage criteria vs. World Heritage cultural landscape categories, 1992-2004**

CULTURAL CRITERIA	CULTURAL LANDSCAPES CATEGORIES
i. … represent a masterpiece of human creative genius; or	**i**. The most easily identifiable is the clearly defined landscap designed and created intentionally by man. This embraces garden and parkland landscapes constructed for aesthetic reasons, which are often (but not always) associated with religious or other monumental buildings and ensembles.
ii. … exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design; or **iii**. … bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or has disappeared; or **iv**. … be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history; or **v**. … be an outstanding example of a traditional human settlement or land use which is representative of a culture (or cultures), especially when it has become vulnerable under the impact of irreversible change; or	**ii**. The second category is the organically evolved landscape. This results from an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment. Such landscapes reflect that process of evolution in their form and component features. They fall into two sub-categories: • A relict (or fossil) landscape is one in which an evolutionary process came to an end at some time in the past, either abruptly or over a period. Its significant distinguishing features are, however, still visible in material form. • A continuing landscape is one which retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress. At the same time it exhibits significant material evidence of its evolution over time.
vi. … be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance (the Committee considers that this criterion should justify inclusion in the List only in exceptional circumstances and in conjunction with other criteria cultural or natural);	**iii**. … The final category is the associative cultural landscape. The inclusion of such landscapes on the World Heritage List is justifiable by virtue of the powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent.

As cultural landscapes, considered 'cultural heritage', are reviewed under the cultural criteria, the following test of authenticity has been applied to this type of property until 2005:

> *24b i. … meet the test of authenticity in design, material, workmanship,or setting and in the case of cultural landscapes their distinctive character and components.*

In addition, the provisions for management and protection, as applied to cultural heritage, had to be fulfilled for the inscription of cultural landscapes.

> *ii. … have adequate legal and/or traditional protection and management mechanisms to ensure the conservation of the nominated cultural properties or cultural landscapes. The existence of protective legislation at the national, provincial or municipal level and/or a well-established contractual or traditional protection as well as of adequate management and/or planning control mechanisms is therefore essential and, as is clearly indicated in the following paragraph, must be stated clearly on the nomination form. Assurances of the effective implementation of these laws and/or contractual and/or traditional protection as well as of these management mechanisms are also expected. Furthermore, in order to preserve the integrity of cultural sites, particularly those open to large numbers of visitors, the State Party concerned should be able to provide evidence of suitable administrative arrangements to cover the management of the property, its conservation and its accessibility to the public.*

Although substantial change had been made with the integration of cultural landscapes, '… well-established contractual or traditional protection' was also introduced into the Operational Guidelines in 1992;[2] the problem with the evaluation of cultural landscapes remained that 'conditions of integrity' were not applied unless the site was also nominated under natural criteria.

In 1996 an important expert meeting took place in La Vanoise, France, on 'Evaluation of general principles and criteria for nominations of natural World Heritage sites'. The expert group discussed the continuum from nature to culture that is covered by World Heritage, and acknowledged the complexity of the interactions between nature and culture. The expert group recommended that the Committee consider developing one set of criteria, incorporating existing natural and cultural heritage criteria and promoting a unified identity for all World Heritage sites, as the outstanding heritage of humankind. The expert group also stated that the notion of integrity has not been fully examined to date, and that its complexity needs to be further investigated. They recognized that, from the point of view of natural heritage, there are different notions of integrity, including structural integrity (*i.e.* the species composition of an ecosystem), functional integrity (glacial series with the glacier itself and its deposition patterns), and visual integrity (a notion which relates to both natural and cultural heritag

The experts also considered the notion of natural heritage, and proposed the following text:

> *A natural area is one where bio-physical processes and landform features are still relatively intact and where a primary management goal of the area is to ensure that natural values are protected. The term, 'natural', is a relative one. It is recognized that no area is totally pristine and that all natural areas are in a dynamic state. Human activities in natural areas often occur, and when sustainable may complement the natural values ofthe area.*

The dilemma of the nature-culture continuum was taken into account during a subsequent World Heritage Expert Meeting, held in Amsterdam, The Netherlands in 1998 (von Droste, Rossler, and Titchen, 1999), and those present proposed to merge the natural and cultural criteria. Following this proposal, consultations were held with the advisory bodies IUCN, ICOMOS, and ICCROM to review whether the conditions of integrity could be applied to the integrated set of ten criteria. Seven years later, in February 2005, the new Operational Guidelines were finally adopted with ten criteria and conditions of integrity for both natural and cultural heritage; authenticity remains in the case of cultural nominations:

> *All properties nominated for inscription on the World Heritage List shall satisfy the conditions of integrity … Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity therefore requires assessing the extent to which the property:*
>
> *a) includes all elements necessary to express its outstanding universal value;*
> *b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;*
> *c) suffers from adverse effects of development and/or neglect.*
>
> *This should be presented in a statement of integrity. (Paragraphs 87-88)*

[2] This concept was applied to natural heritage only in December 1998, following the inscription of the first site from the Pacific, East Rennell (Solomon Islands).

Interestingly, the notion of authenticity was also expanded from the original 'test of authenticity' to include management systems: 'Depending on the type of cultural heritage, and its cultural context, properties may be understood to meet the conditions of authenticity if their cultural values … are truthfully and credibly expressed through a variety of attributes including form and design; materials and substance; use and function; traditions, techniques, and management systems; location and setting; language, and other forms of intangible heritage; spirit and feeling; and other internal and external factors.' This also leads to a new interpretation, moving from materials to character and a sense of place, to communities and the maintenance of tradition and cultural continuity.

As a whole this should be interpreted as a step forward in interpreting 'heritage' in a new way, taking into account its contexts, linkages, environment, and the people living in and around the sites. As the new Operational Guidelines illustrate, much progress has been made with enlarging the concept of 'integrity' and linking it clearly to the notion of outstanding universal value. Due to the integration of new heritage concepts into the Operational Guidelines, in particular that of cultural landscapes, the scope and understanding of 'integrity' in relation to World Heritage sites has broadened. From a narrow definition of including certain natural elements in a property, it has changed to a broader vision of wholeness and intactness alongside factors such as elements and size.

WORLD HERITAGE AND FORESTS

Many forests have been inscribed since 1978, including the first National Park (Yellowstone National Park, USA); nature conservation and forest protection are cultural concepts, and the history of forestry and hunting are linked to cultural perceptions and practices (Miller and Lewis, 1999). Interestingly, there are many forest areas on the list that were not listed for their biodiversity but for other values, such as the Swedish High Coast for geological heritage or the Bialowieza National Park (Belarus/Poland) for its scenic value under the criterion of natural beauty, another cultural concept. Besides these there are many forested areas included in the World Heritage List as part of cultural nominations - see below for some examples. This has far-reaching implications and repercussions for the boundaries and management of such areas.

Three themes will now be considered, using key sites for the analysis of forest and landscape integrity issues:

- *Natural properties where the landscape approach was used in conservation issues focusing on forest properties.*
- *Forest cultural landscapes and integrity issues.*
- *The broader 'linkages in the landscape' approach, including natural and cultural properties and using the results of the 'Linkages in the Landscape' stream at the 2003 World Parks Congress.*

Using the Landscape Approach

As discussed above, the notion of integrity has been enlarged due to the introduction of new concepts into the World Heritage framework. Sites should not be seen as protected areas without people, or islands to be protected *from* people, but in their functional landscape context. Some examples will illustrate this change.

Yellowstone National Park (USA).
The origin of the *World Heritage Convention* in 1972 was also the 100th anniversary of the creation of the first National Park on earth: Yellowstone National Park (circa 1872). This key forest site on the World Heritage List was included on the List of World Heritage in Danger in 1994, following a gold mining project outside of the World Heritage property; the proposal would have impacted on the outstanding universal value of the site and its integrity. The President of the United States stopped the mining project, and the site was removed from the Danger List in 2003; mining activities in and around World Heritage properties have been one of the most frequently reported threats. It is not only the direct impacts on the protected areas, but often secondary impacts (the influx of workers, constructions and infrastructure) which jeopardize World Heritage values. The World Heritage Centre took a proactive approach in a dialogue with the mining industry, which led the International Council on Mining and Metals (ICMM) in the same year to recognize World Heritage properties as 'no-go' areas. This commitment reflects efforts to raise awareness about World Heritage and conservation issues, but also negative experiences such as the mining disaster in 1998 at Donana National Park (caused by a broken tailing dam 40 km away from the site). Clearly an integrated conservation approach, taking into account areas outside the protected property, is required.

Belovezhskaya Pushcha/BiałowieĐa Forest (Belarus/Poland).
Situated on the watershed of the Baltic Sea and the Black Sea, this immense forest range consisting of evergreens and broad-leaved trees is home to some remarkable animal life, including rare mammals such as the wolf, the lynx, and the otter, as well as some 300 European Bison, a species which has been reintroduced into the Park. Today the forest is divided by a fence which marks not only the Polish-Belarusian border but also the EU outside border within the Park, another challenge to the trans-border management of this site. Crucial to the integrity of this virgin forest are the buffer zones and forest areas outside the Park. Logging activities frequently take place outside of the protected World Heritage area, and many NGOs turn to UNESCO in protest. There are about 4,000 people living within the Biosphere Reserve: 2,500 within the transition area and 1,500 in the buffer zone. Their livelihood is predominantly agriculturally based, the main crops being potatoes, rye, wheat, oats, barley, and sugar-beet. The reserve offers few financial benefits to the local

population, and therefore new approaches are taken in environmental education and awareness-raising as well as training opportunities in forestry, forest protection, and other services. However, the forest is and always has been important to people's lives, as they depend on timber and non-timber products and their traditional folklore and handicrafts are also closely linked to the woods. Only close cooperation between local communities and Park authorities can ensure the long- term protection of the site and give the heritage '… a function in the life of the community' as requested in Article 5 of the *Convention*.

Forest Cultural Landscapes

The Holy Valley (Ouadi Qadisha) and the Forest of the Cedars of God (Horsh Arz el-Rab).
One of the world's key forests in terms of cultural value is the sacred cedars of Lebanon, which are mentioned in the Bible. The site was nominated as a natural property, but not inscribed on the World Heritage List due to major integrity issues. The Lebanese authorities then decided to re-nominate the site as a cultural landscape, which brought worldwide recognition to the specific relationship between people and the sacred forest. The Qadisha Valley is one of the most important early Christian monastic settlements in the world. Its monasteries, many of which are very old, stand in dramatic positions in a rugged landscape. Next to the valley are the remains of the great forest of cedars of Lebanon, highly prized in antiquity for the construction of great religious buildings. This site illustrates the problem of fragmentation in the landscape, and demonstrates the new approach required for management and protection. The management system should include the surrounding landscape to provide the context for the site, integrating the natural values and historical links of the cedar forest and the Quadisha valley. Since the revised Operational Guidelines in 2005 require the application of the 'conditions of integrity' to cultural properties and more specifically to cultural landscapes, this has to be applied in a revised management plan that takes into account both the ecological linkages and the cultural linkages (both tangible and intangible, including spiritual) in order to ensure an integrated approach.

Hallstatt-Dachstein Salzkammergut Cultural Landscape (Austria).
The cultural landscape of Hallstatt Dachstein has up to 70 percent forest cover, however this component was not included in the nomination and thus the forest heritage is not recognized as part of the World Heritage value, which is focused entirely on the history of salt production starting with Neolithic salt mining. The cultural heritage of forests is evident in this site, as the salt processing would not have been possible without the forests as a source of energy and construction materials for the mining itself, the village of Hallstatt, and the boats on Hallstatt Lake. These boats are also intrinsically linked to the intangible heritage of the region, such as the Christi Himmelfahrt procession by boat across Hallstatt Lake. For the local communities of this cultural landscape, the forest in fact may constitute the most important natural resource; the forest's management has to be integrated into the overall regional development context.

The Curonian Spit (Lithuania/Russian Federation).
Human habitation of this elongated sand dune peninsula, 98 km long and 0.4 km wide, dates back to prehistoric times. Throughout this period it has been threatened by the natural forces of wind and waves. Its survival to the present day has been made possible only as a result of ceaseless human efforts to combat the erosion of the Spit, as illustrated by continuing stabilisation and reforestation projects. This site illustrates human creativity and the continuous interaction between people and their natural environment. It is also an example of the forest as a place of stories, associated values, and rituals. The struggle to survive and the constant loss of villages to the moving dunes created a specific relationship to the forest, which was considered a safe haven and protection from nature. The site was later protected as a National Park, which includes the conservation of its natural assets and cultural heritage; these are presented together on-site with educational programmes for local children. The Spit was nominated as a mixed natural-cultural heritage but not inscribed under natural criteria, due to integrity issues and the fact that the forest ecosystem was not considered of outstanding universal value. The Committee then decided to recognize it as a cultural landscape, and the Spit's management now integrates both natural and cultural values. Major threats come not only from the over two million visitors per year, but also from oil exploration in the Baltic Sea.

This example demonstrates yet again that a site cannot be considered in isolation within its boundaries, even if it terrestrial site is surrounded by water: the threats to the value and integrity of the property include potential oil spillage from a platform located only 2.3 km away, and from nearby shipping routes. Having said this, it should also be noted that both States Parties have now ratified the *1974 Helsinki Convention*, now The *Convention* on the Protection of the Marine Environment of the Baltic Sea Area (1992) which became binding on 17 January 2000. The case of the Spit also illustrates the importance of enhancing cooperation between Conventions and international agreements in order to address integrity issues. In Europe, the Ministerial Conference on the Protection of Forests in Europe (MCPFE) is a high-level political initiative in support of the protection and sustainable management of forests. This political commitment involves 44 European countries and the European Community, and cooperates with other countries as well as international organizations including UNESCO.

The 'Linkages in the Landscape' Approach: Natural and Cultural Properties

The World Conservation Congress, themed 'Benefits beyond boundaries' and held in Durban, South Africa in 2003, was a turning point. Over nine days of plenary meetings, workshops, and field trips, the participants attempted to address the broadest of all issues, namely conservation linkages in the landscape and seascape. The landscape theme not only became mainstream, it was also interpreted in the broadest sense as linking different systems of protected areas: large-scale landscape management, landscape in the ecosystem approach, improved landscape management effectiveness, reviewing and identifying new, legislative arrangements for cultural landscapes, and forming possible new alliances. Linkages were therefore seen as ecological, economic, cultural, spiritual, and political including trans-boundary.

Linkages in the landscapes and seascapes, as well as World Heritage, featured prominently in the Congress's three principal outcomes: the *Durban Accord*, the *Action Plan*, and 32 recommendations approved by the workshops held during the Congress. The 'linkages' theme was in the end a cross-cutting one, as it integrated protected areas into broader economic, social, and environmental agendas; it also addressed the benefits of protected areas to societies worldwide. Moreover in addressing other values of protected areas, including sacred sites and associative landscapes, the theme provided a unique opportunity for indigenous peoples and local groups, whose voices were hardly heard in the past, to speak out. This new approach was to a great extent accepted and put into practice, reaching 3,000 site managers and protected area specialists from all parts of the world. This outreach may assist in tackling the complex issue of linkages in the daily work of site managers and protected area specialists, as the mainstreaming also attracts governments, donors, and civil society into implementation of the recommendations and the *Accord*.

For the purposes of this article, the workshops on category V Protected Landscapes were of particular relevance: the different discussions explored the idea of landscapes with natural and cultural aspects and values and, through case studies, examined current practice including the application and use of a number of designations including that of World Heritage. It was demonstrated that Categories V and VI, as well as international designations such as World Heritage Cultural Landscapes and UNESCO Biosphere Reserves, can be used together effectively and with other IUCN Categories in order to create linkages in the landscape that conserve biological diversity, respect cultural traditions, and bring benefit to the people and communities closely associated with the landscape. World Heritage sites and cultural landscapes in particular are often central components of a larger landscape strategy, that combines many designations into a strategic landscape 'mosaic' supporting sustainable development.

The planning and management approaches for cultural and protected landscapes are well-suited to accommodate local communities' and indigenous and mobile peoples' traditional management systems, systems of land and natural resource ownership, and entitlement patterns and institutional relationships. These are needed to sustain many landscapes, including the ones shaped by people over time and those with purely 'natural' ecosystems. The underlying principles of Category V and World Heritage Cultural Landscapes include a participatory approach that acknowledges both material and non-material values; considers local and indigenous people; and supports an open and transparent planning and management process based on equity and sustainability.

The cases presented, and the principles discussed, in Durban will hopefully be tested in practice as they are crucial for many forest sites and forest landscapes around the world. A case in point is the Kaya Forests of Kenya, a group of forest patches along the coast nominated for World Heritage listing; they contain 75 percent of the endemic species of the country, but without broader linkages in the landscape. Many such sites may be lost for future generations.

CONCLUSIONS

The case studies above illustrate a diversity of settings and the complexity of the landscape approach, which takes into account interaction between people and their environment. However only the first steps have been taken towards a truly integrated approach. It is crucial to recognize the broader approach on the local, regional, and national levels, and to ensure full stakeholder consultation in particular with local communities and indigenous people. Furthermore, the benefits for the people living in and around the sites must come to the fore; this is essential in order to fight poverty and ensure sustainable development without threatening the values of the sites, whether cultural or natural, tangible or intangible.

World Heritage sites can be key examples not only the nature-culture interaction, but also of the linkages between various protected areas and systems, if they are managed with a comprehensive, integrated system and using a regional 'linkages in the landscape' approach. This also requires new frameworks for training site managers.

In order to better address these issues, the following points should be taken into account:

- Encourage collaboration between different agencies (natural and cultural heritage, forestry and environment, etc.) to ensure coordination.
- Enhance conservation within the broader landscape, and look at the functional and spatial connectivity and buffer areas in order to ensure long-term integrity.

- Involve people in the protection of forest sites at all levels: even more crucial are information, education, and awareness-raising in collaboration with local schools and regional training centres.

The involvement of all stakeholders can be very complex in the case of forest sites in the broader landscape, including forest owners (large companies or private owners), farmers, mining companies, the tourism industry, and local and national governments. Like World Heritage, forests are and have always been a shared heritage between people and nations, both as cultural and natural heritage. With globalization comes the obligation to raise awareness about this heritage, and the intrinsic links between peoples and their forest environments, and between their tangible and intangible heritage. We must cherish our heritage as part of our regional and national identities, and develop innovative tools to protect its future. Sustainability and the regional landscape approach must ensure a use that does not jeopardize that of future generations.

8

Managing the Protected Areas - Landscape Dynamic: The International Model Forest Network Program

Peter Besseau[1]

[1] International Model Forest Network

The International Model Forest Network (IMFN) has been in existence for over a decade. In celebration of its tenth anniversary in 2005, the IMFN Secretariat published *Partnerships to Success in Sustainable Forest Management*[2], which highlighted key areas of impact throughout the world's nearly 40 model forest sites. One of these areas of success, which continues to show great promise, is how model forests and protected areas within their boundaries are working together to address a range of issues - chiefly by looking beyond boundaries to the social, environmental, and economic dynamics at work within the larger landscape or ecosystem. Frequently, this results in better management, fewer conflicts, innovative approaches, and stronger collaboration among traditional and non-traditional stakeholders within that landscape.

BACKGROUND

Two key features of model forests are their large land base and their broad and inclusive partnerships. In the case of the former, the boundaries of a model forest area are meant to include all of the key types of land use and resource values within that landscape or ecosystem. Complementing this, the partnership of a model forest aims to include those who manage the land and those who represent its full range of social, economic, and ecological values. Not surprisingly, given their size (from 85,000 ha to 20 million+ ha), virtually every model forest around the world includes a protected area, from small conservation areas to large national parks or reserves.

Over the past decade, the work on individual model forests has demonstrated a strong positive relationship between protected areas and the broader ecosystems in which they are located. Issues they have tackled range from conflict abatement to consensus-based problem solving, research, enhanced biodiversity protection, engagement of riparian communities and settlements, and enhanced livelihood opportunities. At a landscape or ecosystem scale, model forest partnerships are successfully translating the policies of sustainable forest management (SFM) into practice.

The roots of the IMFN program are found in the Canadian Forest Service (CFS), which piloted a domestic network of ten model forest sites through a competitive process initiated in the early 1990s. The goal of Canada's Model Forest Program was to promote multi-stakeholder cooperation and collaboration in order to advance the conservation and sustainable management of forest resources. Within this definition, protected areas were considered as legitimate entities in the SFM landscape mosaic. The Canadian government brought this promising idea to the 1992 United Nations Conference on the Environment and Development (UNCED), in Rio de Janeiro; with a pledge of ten million Canadian Dollars, Canada's then Prime Minister invited other countries to join in and build an international network of model forest sites to advance field-level progress in the implementation of SFM. To date nearly 20 countries from almost all regions of the world have accepted that invitation, and have contributed to making the IMFN one of the world's largest experiments in developing and demonstrating practical approaches to SFM.

WHAT IS A MODEL FOREST?

A model forest is both a geographic area and a specific, partnership-based approach to SFM. Geographically, a model forest must encompass a land base large enough to represent all of the forest's uses and values: it is a fully working landscape of forests and farms, protected areas, rivers, and towns. As noted above, a model forest is also a voluntary, inclusive partnership whose members fully represent the environmental, social, and economic forces at play within the land base. The partnership works to define a shared, locally relevant vision of SFM, and then works to translate that vision into concrete terms for the benefit of all stakeholders. These partnerships operate on the basis of transparency and consensus. Model forest partnerships are indeed diverse, generally including all or most of the following groups:

- Industry
- Community groups
- Municipal, regional, and national government agencies
- Non-governmental environmental and forestry groups
- Academic, educational, and research institutions
- Indigenous groups
- Private landowners

All model forests share a set of six attributes. These not only provide consistency and coherence across the Network, but also provide the basis (shared approach) upon which networking can take place at multiple levels. These six attributes are:

[2] The publication is available on-line as a pdf file, at http://imfn.net/en/ev-89990-201-1-DO_TOPIC.html

- A partnership that includes key land users and other stakeholders represented in the geographic area.
- Commitment to SFM: overall objectives and program of work are based on an ecosystem approach to forest management, and reflect a shared vision of sustainability.
- Scale: model forests operate at a large scale: for example, landscape, ecosystem, or watershed level.
- Scope of activities: this reflects stakeholders' needs and values (local, regional, and national), and a transparent and accountable governance structure
- Commitment to networking: cooperation, sharing knowledge and experience, and capacity-building. What model forests do depends upon the priorities identified and agreed upon by the partnership group. Within the broad context of SFM, however, these priorities have tended to emerge along the following themes: governance and conflict mitigation at the local and landscape levels; conserving biodiversity and ecological processes; supporting the rights of indigenous peoples and other marginalized groups; economic diversification and poverty alleviation; education, capacity-building, and outreach; and research and development of new management approaches to SFM.
- Finally, model forests are country-driven. They are seen as directly relevant to National Forest Programs, as demonstration areas of national significance, and as cost-effective initiatives to experiment with innovative forest management policies and practices. Model forests provide a forum where stakeholders recognize the impact of their activities on the land base, develop a shared understanding of SFM, and learn what it means in real, operational terms. With this knowledge the partners can take concrete steps, on their own and as a group, to move toward an SFM regime.

THE INTERNATIONAL MODEL FOREST NETWORK

As a member of the IMFN, a model forest organization and its lead national or sub-national agency (as appropriate) commit to sharing experiences and innovations with other model forests, as well as with others who can benefit from this expertise locally, nationally, and internationally. The 40 sites that currently make up the IMFN represent an aggregate base of some 1,000 partners, in almost all regions of the world and in forest types ranging from northern boreal to humid tropical. Networking at regional and international scales is complex, with differences of program focus, language, time zone, and culture; to coordinate and facilitate such linkages, the government of Canada supports the operation of a network Secretariat, based at the International Development Research Centre (IDRC) in Ottawa.[3] The Secretariat provides technical support, site- and regional-level training, and information and communications functions, and facilitates exchange and learning opportunities between model forests. It provides limited financial support for model forest and network activities.

Objectives of the International Model Forest Network Secretariat

1. *To foster international cooperation and exchange of ideas on the concept of and practical experiences in sustainable forest management;*
2. *To facilitate international cooperation in field-level applications of sustainable forest management; and,*
3. *To use these concepts, experiences, and applications to support ongoing international discussions on the principles, criteria, and policies related to sustainable forest management*

More recently and as the number of model forest sites has increased substantially, the IMFN has managed this growth by developing regional networks. In addition to 'packaging' delivery of a network program into more manageable subunits, regional networks also have the advantage of ensuring that program development and regional priorities are set by the regional participants themselves; Canada, Latin America and the Caribbean, and Asia each work within a formal or (in the case of Asia) informal network of sites. The IMFN is also closely linked to and supportive of several major themes of the World Summit on Sustainable Development, including health and environment, international environmental governance, stewardship and conservation, innovation and partnerships for sustainable development, and sustainable communities. It is worth noting here that the most significant challenge post-Rio has been to make sustainable development practical by translating concepts, policies, and commitments into action on the ground. Model forests are demonstrating how this can be done.

MODEL FORESTS AND PROTECTED AREAS

Under a common SFM framework, the model forest draws together many of the stakeholders who, in their respective decision-making processes, are likely to have a heavy influence on the nature of the forest landscape surrounding the protected area (PA) embedded within its boundaries. Forest product companies, landowners, farmers, municipal and national governments, protected area managers, recreational organizations, tourism interests - all have a unique influence on how the landscape will evolve over time and each may react differently to changing social, political, and economic circumstances affecting the landscape.

[3] The IMFN Secretariat is governed by a Board of Directors consisting of its four core funders (IDRC, Foreign Affairs Canada, Natural Resources Canada/Canadian Forest Service, and the Canadian International Development Agency), as well as the United Nations Food and Agriculture Organization (FAO) and the Chair of the Regional Model Forest Network for Latin America and the Caribbean.

Under these circumstances, the model forest provides a practical forum through which PA managers can reach out to a broad range of forest interests to ensure that landscape level issues affecting protected area integrity can be discussed, concerns expressed, and solutions proposed. These issues are raised within an SFM perspective, *i.e.* with a look at how the forest can deliver a variety of measurable benefits to the collection of different stakeholders over the long term. As forest PAs are the source of a particular set of forest-related benefits (water, soil and biodiversity conservation, game animal habitat, microclimate regulation, economic development through tourism and recreation, and more, depending on the nature of the PA), they represent SFM elements of value to a diversity of stakeholders.

As can be seen from the examples below, the participation of PA managers and staff in a model forest has provided many benefits in several directions. What is not clear from the examples though, and what is important to highlight, is that a key strength of the model forest is derived from the fact that the model forest partnership has no executive authority over the land-base. This feature provides the conditions under which those with ownership or authority (forest industry, government at all levels, private owners) agree to sit and discuss issues with those without it (community groups, recreational users, indigenous people). Essentially, the model forest provides a risk-free and non-threatening platform for stakeholders to explore issues in an open and creative way, indulge in 'What if?' discussions on alternatives to the *status quo*, and find sufficient common cause to agree on a path of action. What compels participation in a non-traditional partnership arrangement is often the recognition that while each has a different role to play, sustainability is a shared problem that will require shared efforts. Indeed, model forest representatives are consistently of the view that the advances they have made would not have been possible without the partnership.

Fundy Model Forest

The Fundy Model Forest (FMF), in New Brunswick, Canada, for example, includes Fundy National Park. It is bounded by small private woodlands, industrial freehold lands, and communities. Fundy National Park is a partner of the Fundy Model Forest, and Park staff members, including their Manager of Heritage Protection, actively work on model forest program teams. Through the model forest partnership, and with the model forest approach, Fundy Model Forest has made important inroads into the management of key natural values both inside and outside of the National Park. Thus the partnership has been directly involved in the development of guidelines on indicators of sustainability, to assist in wildlife management and biodiversity protection strategies. Some of this work was led by the Greater Fundy Ecosystem Research Group, one of the founding partners of the FMF. This is a collaborative research group, made up of researchers from Universities and both federal and provincial levels of government; their mandate is to help preserve the ecological integrity of the Fundy Park, and this group of researchers has collaborated with the FMF and co-funded a large number of research projects over the years. This new knowledge has led to indicator development, determination of threshold levels, habitat suitability models, and other areas.

Fundy Model Forest work on ecosystem-based natural disturbance regimes has been possible largely because of the perspective that the comprehensive model forest partnership brings. In addition partners have worked jointly, including on National Park management, to address issues of forest fragmentation and natural Acadian forest restoration. With two important salmon-bearing rivers shared by Park, forest industry, and private land owners, the partnership is now collaborating to better coordinate and improve the formers' management. This will probably also include model forest input into proposed new provincial guidelines to protect Atlantic Salmon habitat. Finally, the model forest partnership, including National Park staff, provided know-how in setting up ten biological reserves outside of the park area and thereby further enhancing biodiversity in the province.

Foothills Model Forest

Foothills Model Forest, in Alberta, Canada, encompasses roughly 2.75 million ha of Alberta bordering neighbouring British Columbia. This model forest includes Jasper National Park, one of Canada's most renowned, Willmore Wilderness Park, and approximately 800,000 ha of managed forest. In addition to being a significant wilderness area with tourist and recreational value, the region also features oil, gas, coal, and forest industries. Historically, the large stakeholders (park and various natural resource-based industries) did not have a tradition of communication, let alone of working together; each had a different management objective within the areas they were responsible for. However, this Rocky Mountain ecosystem, which includes insect and forest fires as part of the natural disturbance regime, has significant populations of grizzly bear, moose, mountain goat, sheep, caribou, and other wildlife. Over time and with significant resource extraction activity, increasing recreational use, and a growing population, there were more and more compelling reasons to start looking at the whole landscape rather than its individual pieces. The model forest provided was a platform and mechanism for this to happen; the model forest program provided a non-threatening and risk-free way for the stakeholders to join together, and to begin the process of understanding and managing their own individual land bases and of understanding the positions of others: essentially, a broader-scale appreciation of the natural and human influences on the landscape. As in the case of Fundy Model Forest, the Superintendent of Jasper National Park became active in the Foothills Model Forest, holding one of the seats on its Board of Directors.

The model forest created opportunities that would not otherwise have occurred. These include:

- Joint development of local-level indicators of sustainability for the model forest area.
- An extensive study of grizzly bears that was linked to land use patterns, especially cut-blocks and roads.
- Interpretive and educational programs inside and outside the Park.
- Joint work on community health and well-being.
- Creation of demonstration areas to reproduce natural disturbance regimes, including controlled burns inside and outside of the Park.
- Joint GIS and cartography work.
- Collaboration on multiple studies of Aboriginal communities' traditional knowledge and culture.

According to the model forest general manager, natural disturbance- and ecosystem-based planning are now the models for the area, representing a major breakthrough: the landscape is now understood and viewed without borders. Today, the model forest has succeeded in undertaking groundbreaking research on wildlife and natural disturbances. It has brokered stronger relations among traditionally distant stakeholders, including stronger federal/provincial relations; and it has leveraged significant additional funds that allow it to address a host of shared issues within the landscape.

Chiloé Model Forest

Chiloé Model Forest is located in the X Region of the Chilean archipelago. The one million ha island is, in fact, a UNESCO World Heritage site. In 1982, well before the Model Forest was established, the Chilean National Forest Commission (CONAF) established Chiloé National Park with a view to protecting forest and biodiversity from agricultural expansion and local pressure for fuel-wood. The area that was made into a Park was also home to indigenous Mapuche-Pehuenche peoples. The problem, including for the Chilean government, was that the Park was established without a consultative process with local inhabitants and this resulted in expropriations, community relocations, and limitations on access. This, in turn, resulted in frustration and conflict; these problems and grievances persisted without resolution until the model forest was established in 1997. Through it the model forest partnership, which includes CONAF, has worked to address local grievances while supporting the management values the Park represents, and to address the legitimate economic and other needs that the local communities have.

The result of the model forest's work is the development of new policies on consultation and planning around conservation and protected areas, chiefly by strengthening local input and building awareness of potential impacts. In Chiloé, the model forest successfully brokered creation of a local advisory council and initiated integrated management planning for the first time. In addition to other advances, all partners came to agreement on establishing buffer zones around the Park. At present the model forest is working to develop best practices for SFM and is extremely active, through a small grants program and educational outreach, in improving livelihood opportunities and alternatives. The model forests' environmental education program is very strong, and culminates each year in an 'enviro-fair' that draws thousands to learn about the island's ecology, the products derived from its natural resources, and the visitors' collective stewardship responsibilities.

Li'nan Model Forest

China's Lin'an Model Forest, located three hours west of Shanghai, includes the Tian Mu Shan (Heaven's Eye Mountain) protected area. Home to a nearly 1,000 year-old Buddhist monastery, the area is also culturally and historically significant. With Shanghai's 16 million people within an easy drive, there was a clear need to manage, and perhaps even limit, access in order to safeguard key ecological and cultural assets. Through the model forest, work was undertaken to better derive acceptable tourist loads for the area, to support sustainable levels of tourism and ecotourism, and in so doing to maximize job creation and the retention of wealth in the model forest region. This work, on both tourism and ecotourism within its protected areas, was one component of an integrated package of activities for the entire model forest territory.

AN EMERGING GOVERNANCE MODEL

The examples cited above represent only a small cross-section from the IMFN and its work. Virtually every model forest has a number of protected areas. For example Gassinski Model Forest, in Russia's Far East, worked to develop the region's first National Park, the Aniuski. Elsewhere, model forests that contain biosphere reserves are able to use their partnerships to better protect the values for which the biosphere reserve was established. The potential of model forests to strengthen protected areas, though, has not been adequately documented or analyzed. But the results documented to date, and feedback from PA and non-PA representatives, clearly show that this arrangement is generating positive results.

The partnership and program structure that has emerged through the IMFN experience suggests a possible governance model that could have high value for other protected areas. Opportunities should be sought, for example, to work with the network of World Heritage forests, particularly in Africa; to explore its potential contribution to making communities in and around protected areas full and active stakeholders in protecting the natural values of their ecosystem; and to provide them with the means of realizing their legitimate economic and social aspirations.

9

Managing a Protected Area Within its Wider Landscape: Tools for Assessment and Enhancement

Leonardo Lacerda[1], Marc Hockings[2], Steven Ripley[3], and Luiz Roberto Numa de Oliveira[4]

[1] WWF International
[2] IUCN WCPA
[3] UNESCO World Heritage Centre
[4] Forestry Institute of Brazil

INTRODUCTION

There are now over 100,000 protected areas (PAs) worldwide, covering over 12 percent of the Earth's surface. Merely measuring the number of protected areas, however, only provides a one-dimensional indicator of political commitment to biodiversity conservation; it gives no information on a key determinant for meeting global biodiversity targets, namely a site's 'effectiveness' in conserving biodiversity (Chape et al., 2005). A protected area that has been designated to conserve in situ biodiversity can only fulfil its intended function if it is effectively managed. In its broadest sense, 'management' includes all actions by all relevant actors which have a bearing on the continued integrity of the protected area. Management effectiveness should therefore include as a central component a protected area's integration with its surrounding landscape.

For countries who are signatories to the Convention on Biological Diversity (CBD) and therefore must comply with international obligations concerning protected areas, there is a need to assess the question of how effectively managed their protected areas are, including how well the latter are integrated with their social, political, environmental, and decision-making landscapes. This is invariably a difficult question to answer. When a large number of sites, or indeed entire national protected area systems, are to be assessed in relation to the goals and targets set out in the CBD's Programme of Work on Protected Areas (PoWPA) for example, the challenge becomes even greater.[5] Without such an assessment however it would be difficult for a national government and its agencies to formulate appropriate policy or to identify the areas or specific sites on which to focus effort. Furthermore, without such an assessment at the appropriate scale it would be difficult to know what objectives to set. A country, national government, or protected area authority must ask some fundamental questions including the following: Are the protected areas achieving their objectives? If not, what are the proximate and root causes? How can management interventions mitigate these factors, so that PAs make an optimal contribution to biodiversity conservation and local sustainable development?

Once pressures have been identified and assessed, it is important to build in strategies that address both the proximate threats (such as poaching, encroachment, or illegal logging) and the underlying or root causes (such as poor governance, poverty, and perverse subsidies). Consistent with a landscape approach, strategic interventions will range from site-based actions to those at national, landscape, eco-regional, or even international levels. A system-wide assessment of this type should help landscape planners and other relevant stakeholders produce a general map, or land-use mosaic, that not only makes optimal use of the resources present (including applicable concessions and trade-offs to local people or legal loggers respectively) but also minimizes the ecological gradients between protected areas and adjacent lands.[6] In practice the starting point may be a 'landscape' defined along strictly biological parameters, which can then be refined to take account of social, economic, political, and institutional realities (Aldrich et al., 2004).

The tools outlined below demonstrate three incremental scales, based on the World Commission on Protected Areas' Management Effectiveness Evaluation Framework (WCPA Framework), at which an assessment can be made, from the most general to the most in-depth. Each of these processes results in a corresponding set of recommendations which may be most appropriately directed to an eco-region, country, or specific site. The first of these, the World Bank/WWF Management Effectiveness Tracking Tool, is the most general, broad-scale of the methodologies and is as such most suited to consideration of large areas. This methodology and process form part of a series of management effectiveness assessment tools, which also includes secondly the WWF Rapid Assessment and Prioritization of Protected Areas Methodology (RAPPAM), used to identify key protected areas at risk within a protected area system, and thirdly the highly detailed and time/labour intensive monitoring systems such as those being developed by the Enhancing our Heritage project in several World Heritage sites. Each of these three, along with the overarching WCPA Framework, is covered separately and in more detail below with particular reference to the landscape approach.

The WCPA Framework

The WCPA Framework, on which the suite of assessment tools is based, was developed by the IUCN's World Commission on Protected Areas. The Framework guides the development of assessment systems by providing an overall structure for evaluation, a checklist of issues to be assessed, suggestions of some appropriate indicators, and basic standards for assessment and reporting. The WCPA

[5] For example Programme Element 1, 'Goal 1.2 - To integrate protected areas into broader land- and seascapes and relevant sectors so as to maintain ecological structure and function. Target: by 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, by applying the ecosystem approach and taking into account ecological connectivity/ and the concept, where appropriate, of ecological networks.'

[6] For an in-depth study of adjacent land use and ecological gradients see 'Land Use Planning and Regulation In and Around World Heritage Sites and Other Protected Areas: A Study of Best Practices and Capacity Building Needs in Mexico and Central America' in this publication.

Framework is based on the premise that the process of management starts with a vision, progresses through planning and allocation of resources, and as a result of management actions, produces results that are intended to lead to the desired outcomes. Monitoring and evaluation of these stages provides the link that enables planners and managers to learn from experience. The Framework also helps governments, funding agencies, and communities measure how well their project or area is doing. Figure 1 presents a common framework within which evaluation and monitoring programmes can be established.

Ideally assessments should cover all of the elements in the Framework, because it is the relationship *between* performances in different aspects of management that often provides the most useful information. For example, monitoring inputs and outputs over time can be especially useful to show changes in management efficiency and may highlight the effectiveness of a particular change of management. However, it should be stressed that assessment of outcomes is the most important (and often neglected) aspect of management effectiveness.

Figure 1. Evaluation in the management cycle

Table 1. **Summary of the WCPA Framework**

Elements of evaluation	Explanation	Criteria assessed	Focus of evaluation
Context	Where are we now? Assessment of importance, threats and policy environment	- Significance - Threats - Vulnerability - National context - Partners/Stakeholders	Status
Planning	Where do we want to be? Assessment of protected area design and planning	- Protected area legislation and policy - Protected are system design - Reserve design - Management planning	Appropriateness
Inputs	What do we need? Assessment of resources needed to carry out management	- Resources of agency - Resources of site	Adequacy
Processes	How do we go about it? Assessment of the way in which management is conducted	- Appropriateness of management processes	Efficiency and appropriateness
Outputs	What were the results? Assessment of the implementation of management programmes and actions; delivery of products and services	- Results of management actions - Services and products	Effectiveness
Outcomes	What did we achieve? Assessment of the outcomes and the extent to which they achieved objectives	Assessment of the outcomes and the extent to which they achieved objectives, conservation of values and abatement of threats	Effectiveness and appropriateness

Using this Framework, more detailed methodologies and implementation processes have been elaborated. The numbered sections below briefly describe the three examples of tools cited by the authors, which have been developed from the above framework. The three methodologies are briefly described, including their limitations and an example of their application with the corresponding results reported. The results include general trends that are pertinent to the landscape approach as well as some specific references to WH sites.

1. THE WORLD BANK/WWF TRACKING TOOL[7]

A broad instrument for eco-regional, continental, or even global application, the World Bank/WWF Tracking Tool has been used in over 300 protected areas and over 40 countries. At a basic level the tool consists of 30 questions with an ordinal scale of assessment for each, alongside a qualitative response option.[8] This tool was developed to help track and monitor progress over time. When the system was developed, desirable design characteristics included expediency, ease of replication, consistent data to allow for tracking progress over time, minimal resource demands, the capacity to provide a 'score' if required, ease of understanding by non-specialists, and nesting within existing reporting systems in order to avoid duplication of effort. The Tracking Tool provides a relatively quick and easy method to evaluate progress over time in individual protected areas, which do not necessarily conform to a network or system of PAs. The tool has been adopted and is used by The World Bank, WWF, and the Global Environmental Facility.

Limitations

The tracking tool was developed to provide a quick overview of progress in improving the effectiveness of management in individual protected areas. Because of the great differences between expectations, resources and needs around the world, the tracking tool also has strict limitations in terms of allowing for comparison between sites; the scoring system, if applied at all, will be most useful for tracking progress over time in one site or a closely related group of sites. The tracking tool is also too limited to allow a detailed evaluation of outcomes, and is really aimed at providing a quick overview of the management steps identified in the WCPA Framework up to and including outputs.

In spite of its simplicity and many limitations, the Tracking Tool has proven to be a very useful instrument for building a baseline of management effectiveness, for tracking progress over time, for providing critical information about systemic protected area issues that need to be addressed, and for putting in place a simple monitoring system in sites which may be able to afford a more detailed system in the future.

Case study: 207 Protected Areas in 37 Countries

The 2005 WWF publication 'Are Protected Areas Working?' presents an analysis of 207 protected areas in the WWF project portfolio through the Tracking Tool. Among the protected areas studied, 15 are Natural World Heritage sites in 11 countries. Examples of the findings extracted from the WWF Report are given below.

Status of management performance:
In general, issues relating to legal establishment, biodiversity condition assessment, boundary demarcation, design, and objective setting were satisfactorily addressed, while activities relating to people - both local communities and visitors - were less effective, as were management planning, monitoring and evaluation, budget, education, and awareness. There is a very good correlation between the success of a protected area in education and awareness-raising and its overall effectiveness, with the highest correlation coefficient out of all those tested. This is highly significant in terms of future interventions, because education was one of the issues in which many parks scored lowest. Closer attention thus suggests that a good monitoring and evaluation system is also closely correlated to those protected areas where biodiversity is being best conserved. Unfortunately, few protected areas reported having comprehensive monitoring and evaluation programmes.

One problem identified consistently was the failure to manage relations with people. Problems are evident in channelling the input of local communities and indigenous peoples, and in securing their voice and participation in decision-making. Management of tourists is also problematic, with the provision of visitor facilities and access to commercial tourism scoring lowest of all. In spite of this, respondents identified work with communities among the top critical management activities. The two charts below show the key strengths and weaknesses of the 15 WH sites studied. In terms of strengths, the sample demonstrated that research and resource inventories are more systematic in WH sites than in the other protected areas studied. With respect to weaknesses the lacking participation of indigenous peoples and local communities in protected area governance, limited financial resources, absent budget security, and the lack of good monitoring and evaluation were consistent with the overall portfolio of protected areas analyzed. It was disappointing however to note that the relationship of the WH sites to commercial tourism remains very weak, particularly as many of these areas offer opportunities for recreation; the lack of management plans was another surprise. Finally another important weakness was that the current design of WH sites

[7] The Tracking Tool is available in the following languages: English, French, Spanish, Portuguese, Chinese, Russian, Bahasa Indonesia, Lao, Khmer, Vietnamese, and Mongolian. The methodology is available, in English, at http://www.panda.org/about_wwf/what_we_do/forests/our_solutions/about_programme/tools.cfm#tracking

[8] The report, 'How effective are Protected Areas?' is published by WWF International and can be consulted online at: http://www.panda.org/downloads/forests/protectedareamanagementreport.pdf

imposes limits on the achievement of area conservation objectives; this requires a broader landscape approach to serve the purpose for which the areas were designated, and in some cases a revision of PA design.

Trends - Are PAs being managed better over time?
There was a highly significant relationship between overall score and IUCN category, with the most highly protected categories exhibiting more effective management (although caution is needed here, as the sample size of less highly protected categories was low). Interestingly, there were no significant differences in effectiveness between World Heritage, UNESCO Man and the Biosphere, and RAMSAR sites as compared to other protected areas. The expectation may be that the protected areas of greatest global relevance should also be exemplary in their management, but this hypothesis could not be confirmed. The critical message is that a great effort needs to be made to improve management of the natural WH forest sites, and in order to be able to track such improvement over time.

Threats - What is eroding biodiversity in our forest protected areas?
Protected areas face a series of critical threats. The most severe threats to forest protected areas identified spontaneously by respondents were poaching (identified in a third of PAs), encroachment, logging (mainly illegal), and collection of non-timber forest products. These four were considered to be key threats in more protected areas than all the other problems combined.

Critical management activities: key success factors for management effectiveness.
Enforcement showed one of the strongest relationships to management effectiveness. Enforcement activities carried out by a motivated, competent, and empowered corps of rangers are critical, particularly where protected areas face problems from poaching or invasion. However, it should be noted that protected area staff also placed a strong emphasis on community issues and sustainable resource use - issues that would not have appeared in most protected area management plans a few years ago.

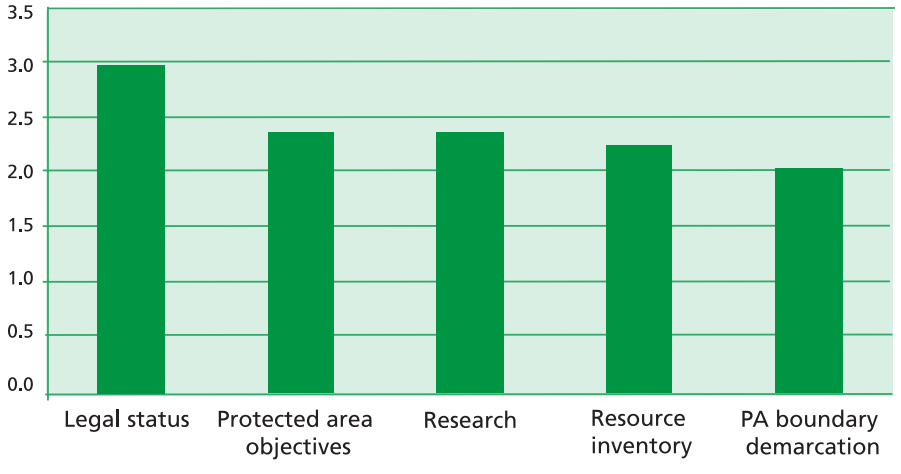
2. RAPPAM[9]

The next level of detail and corresponding resource commitment is the Rapid Assessment and Prioritization of Protected Area Management, or RAPPAM. This assessment tool can be applied to a national network of protected areas, and implementation of the methodology consists of administering an adapted questionnaire, analyzing the resulting data, and producing recommendations for future strategic actions. This process includes convening a series of associated workshops, amongst other things, to develop and refine the questionnaire and promote more effective participation. The questionnaires are then presented in a series of modules on subjects such as biological importance and vulnerability. Relevant modules were answered firstly by managers, and eventually by the community representatives and stakeholders linked to each protected area.

Limitations

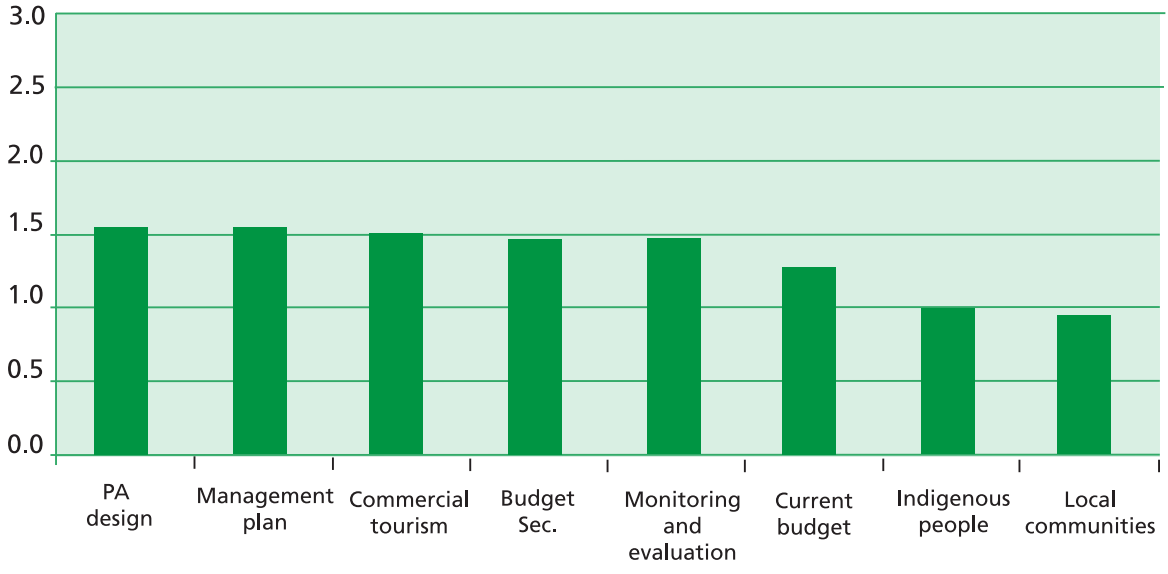
As with the other tools discussed here, the limitations of this approach largely result from the scale at which it is effective: the series of workshops flowing from this methodology would be difficult to organize were the scale of application significantly larger. Also as a result of the scale, emerging recommendations are of a general nature: they point to trends across a national protected area system rather than to specific issues at an individual site.

Chart 1: Key strengths of a sample of 15 World Heritage Natural sites



[9] For details on the RAPPAM methodology see the WWF Forest Program pages at: http://www.panda.org/about_wwf/what_we_do/forests/our_solutions/about_programme/tools.cfm#RAPPAM

Chart 2: Key weaknesses of a sample of 15 WH sites



Case Study: 32 Protected Areas in Brazil

São Paulo State has the highest levels of urbanization and industrialization of the country. It also features the largest remnants of Atlantic Forest, which shelters a large proportion of Brazil's endangered animal species, and is classified as one of the world's most important biodiversity conservation areas (a 'Biodiversity Hotspot'[10]). The protected areas in the Atlantic Forest also function as ecological corridors inter-linking the forested areas of Rio de Janeiro State to the north and Paraná State to the south; together these form the main Atlantic Forest stretch in Brazil. Approximately half of the forest's area is strictly protected, and most of it was in the study area which also included the UNESCO Atlantic Forest Biosphere Reserve, the São Paulo City Green Belt Biosphere Reserve, and the Atlantic Forest Southeast Reserves World Heritage site.

In São Paulo State the Forestry Institute, a division of the Environment Secretariat, is the main institution with responsibility for the management of strictly protected areas (such as State Parks and Ecological Stations). Together with WWF Brazil and the Forestry Foundation, the Institute formed a team to coordinate the implementation of the RAPPAM methodology in the state's protected area system.

The outcomes of the different questionnaire modules offered some unexpected results, as well as reaffirming some general patterns already observed in protected areas. The results of the vulnerability module for example, which looked at cultural practices and traditional uses that conflict with conservation objectives, the existence of high market value resources, and ease of access for illegal activities, demonstrated that most of the protected areas are very vulnerable regardless of their designation. A particularly evident problem was the ease of access for illegal activities, largely due to the proximity of a dense and well maintained road network. On the other hand, certain factors were found to have little influence: conflict with cultural practices, traditional beliefs and uses, the occurrence of bribery and corruption, and the existence of civil unrest and/or political instability. Positive points in the 'management process' section of the effectiveness framework were clear: internal organization, participatory decision- making, and regular staff collaboration with partners, local communities, and other organizations.

Use of the RAPPAM methodology showed that all the protected areas present satisfactory management effectiveness, as their establishment conditions are consistent with the objectives, legal security, site design, and connectivity of the protected areas in the region. Besides these issues, the layout and shape of the protected areas optimize conservation of biodiversity, and are consistent with the socio-environmental situation and its management categories. Partners, local communities, and other institutions regularly collaborate, and there is clear internal organization as well as participatory and transparent decision-making. Of the 32 classified protected areas in the study more than half scored well on issues of participatory management, with no unsettled disputes regarding land tenure, use rights, and visitor control. Nine protected areas received a low evaluation, mainly due to insufficient staff inputs. Moreover, staff performance and progress in reaching targets was not periodically reviewed, training and development opportunities were not appropriate, and employment conditions were not attractive enough to retain a highly qualified staff. These protected areas also show deficiencies related to the identification and prioritization of research and monitoring needs, inventory of natural and cultural resources, and research on key ecological and social issues.

[10] See Conservation International's Biodiversity Hotspots at: http://www.biodiversityhotspots.org/xp/Hotspots/atlantic_forest/

The RAPPAM methodology also includes a protected area system-level design module, as an indicator of the system's management effectiveness in preserving a representative sample of key species and ecosystems. In this case study the system-level design assessment indicated some problems, in that the system needs to be enlarged to include floodplains, mountain grasslands, enclaves of Brazilian Savannah, and mangrove and beach environments, among others. The maintenance of natural processes at a landscape level also shows weaknesses, and improvement is needed particularly for these habitats. In addition, the system layout and configuration does not currently optimize biodiversity conservation, as it excludes areas that preserve flows between ecosystems and the above-mentioned areas.

A selection of the recommendations emerging from this application of the RAPPAM methodology includes introducing entrance and public use services charges and concessions; improving transparency regarding reinvestment of generated incomes; establishing a financial return from water resource use and other environmental services; establishing a communication programme for São Paulo State's protected area system involving media and park-radio; preparing campaigns aimed at surrounding communities; and establishing an articulation and communication advisory group to improve internal and external information exchange.

3. ENHANCING OUR HERITAGE[11]

The most detailed and intensive process of assessing and improving management effectiveness based on the WCPA framework is the methodology currently being developed through the Enhancing our Heritage project (EoH project). This project was initiated in a small number of pilot World Heritage sites in Africa, Asia, and Latin America to develop and test assessments not only of management systems but also of social and ecological impacts. The underlying premise of the EoH project is that World Heritage sites undertake the assessment of their own management effectiveness; for the self-assessment to be rigorous, it is essential that site managers develop a team of stakeholder representatives to work with them in developing the process. Although all sites in the case study below were engaging in some level of stakeholder dialogue, this was more commonly a one-way conversation rather than working with stakeholders to ensure effective site management (EoH, 2004).

Limitations

The major limitations of this methodology are the resources, in terms of both finances and time, which this assessment requires. The basic tool kit for assessing management has now been incorporated in a workbook and a CD (the latter contains both the workbook and explanatory PowerPoint presentations). There is also a corresponding and regularly updated website that includes all the publications relevant to the project. However due to the relatively intense resource input necessary for this process, it is likely that external support will be needed to conduct the assessment system in most cases.

Case Study: Nine World Heritage Sites in Africa, Asia, and Latin America

Among the sites that are currently participating in this project, a number of examples clearly demonstrate the recurring incidence of landscape-level considerations effecting management intervention priorities. For example in Keoladeo, India, the needs of local people to have access to fresh water must be balanced with the needs of the park and its water-birds. By supporting research aimed at understanding wetland dynamics, the EoH project is supporting the development of long-term monitoring regimes for assessing water balances. Also notable in this site is the direct consultation with local villages which will hopefully enhance understanding of the participatory processes.

In Uganda, gorilla-based tourism constitutes a major source of income for the local population surrounding Bwindi Impenetrable National Park. The Park's management and the Bwindi-based Institute of Tropical Forest Conservation recognize the need for knowledge and assessment of a far broader range of community interactions with species and ecosystems. As such, the EoH project supports an updated vegetation mapping, resource inventories, and research on the sustainability of local non-timber forest product harvesting (among others). The level of community participation in this site is particularly strong, resulting in the most diverse range of views being expressed; conversely this highlights the difficulty of reconciling the views of local stakeholders with those of Park staff. As part of the assessment process, Park staff members have worked with stakeholders to include the views of the latter in the overall assessment; despite continuing difference on some issues, the results have been very positive (Hockings, 2003). The outcomes so far include an increased awareness of management issues and conservation objectives; one tangible result is the handing over of over four km^2 of community land for gorilla conservation.

In Canaima, Venezuala, managers have worked with a team of stakeholders to develop monitoring and assessment processes. In this National Park the EoH project has brought together representatives of all the principal stakeholder groups: civil society, the private sector, local and national governments, indigenous groups, and the National Guard, for the first time and to form a local consultative team. This element of the EoH project, also found in other approaches that reconcile the needs of the local population with those of conservation, constitutes one of the central pillars of the ecosystem approach. A more

[11] Information on the project and its methodology is available at http://www.enhancingheritage.net

detailed example of one of the other World Heritage sites in which EoH is being carried out is featured elsewhere in this publication.

DISCUSSION

The summary table below reviews the scale, resources, and perceived strengths and weaknesses of the three management effectiveness evaluation systems.

As protected areas become more fragmented and the pressures on them increase, the premise that World Heritage forest sites should be as pristine and undisturbed as possible and that management should protect World Heritage forests against all human intervention becomes progressively less tenable.[12] The ecosystem approach, founded on a '… strategy of equitable management of land, water, and living resources for conservation and sustainable development' (Smith and Maltby, 2003), attempts to reconcile proximate human demands with those of broader conservation aims. The landscape approach expands this framework yet further, to take into account national development trajectories. Much of what will be attempted with the ecosystem and landscape approaches is quite new, and it is therefore especially important to ensure that progress is monitored effectively and that lessons are both used to improve the programmes as they develop, and transmitted around and beyond the immediate conservation programme.

Whether applying a landscape approach to a single World Heritage forest site or a national system of protected areas, the necessity of first assessing the site or system is clear. Without this assessment any activities or interventions risk being at best misdirected, or at worst counter-productive. Of course not all management interventions will be concerned with the wider landscape, but it is highly probable that a PA management authority that has completed an evaluation exercise such as those above will be better placed to identify and prioritize threats and to counter them in a targeted and effective manner. Moreover and also as above, where such an evaluation process has highlighted deficiencies in community outreach and local population education, it is more likely that the management will be able to act in order to counter developing threats in the surrounding landscape.

Another use of the management effectiveness evaluation tools is the consideration of a specific threat, for example poaching or agricultural encroachment. As evidenced here

Table 2. **Summary of the three tools**

	Tracking Tool	RAPPAM	EoH Tool
Scale	Global, eco-regional, national	National, protected area system	Small number of selected sites
Resources	Small	Medium	Large
Turnaround Time	Short (weeks-months)	Intermediate (6 months to 1 year)	Long term (2 to 4 years)
Strengths	Expedient, allows rapid baseline establishment and subsequent progress monitoring	Detailed survey and recommendations for a specified system or network of protected areas	An effective and integrated management system adapted to each site's particular conditions
Weaknesses	Not in-depth, only indicative of areas for more detailed study	Difficult to coordinate over a larger area, best focused on a region of neighbouring protected areas	Resource intensive, requires staff able to dedicate significant time and effort
Users	Organisations wanting a global perspective: development banks, international NGOs, bilateral development agencies, UN organisations	Agencies dealing with a defined group of neighbouring protected areas: national government agencies, NGOs	Agencies and managers targeting a specific and limited number of sites: bilateral and multilateral aid agencies, local communities, national or local NGOs

[12] For a specific example of counter-productive intervention, see the section on the rise of illegal incursions after a local community's rights to enter a PA were revoked, in 'Capacity-Building of Managers in Multi-Use Landscapes: Recent Experiences of CATIE in Sustainable Forestry Management' (in this publication).

and in other articles in this publication, these are some of the most serious and prevalent threats to PAs, particularly in developing countries. Without quantifiable evidence however these threats may not receive the level of political attention they deserve. On the other hand if such factors can be identified as system-wide issues that must take priority, this will give them the needed weight in national policy settings. Thus management effectiveness evaluations may assist, if indirectly, in tackling the root causes of threats to PAs. For example the cost-efficient, broad-scale WWF tracking tool might be used to provide a first indication, followed by a more in-depth evaluation (such as the RAPPAM) of an identified priority area, resulting in the identification and/or quantification of threats such as poaching. Conservation proponents would then have clear evidence to support their calls for additional resource allocation or policy change. Alternatively, the demonstration of one thorough methodology may be enough to encourage a national government to incorporate the methodology's 'best practices' into national PA policy, as was the case with the EoH project in Ecuador.

In conclusion, if an ecosystem or landscape approach is to be adopted and applied successfully to a protected area system, the system itself should be first assessed at a range of levels. As a result of these assessments targeted capacity-building can be directed towards appropriate site managers or decision-makers, who may otherwise be ill-equipped to meet the wide range of complex and demanding roles required of them (Ishwaran, 2004). Concurrently to capacity-building efforts, resources should be directed towards establishing local consultative entities that feature all relevant stakeholders and thereby relieve some of burden on the managers' shoulders. While assessments are not a panacea, protected areas that *have* carried out an effectiveness assessment, directed resources accordingly, and established a multi-stakeholder consultative group in which representatives have legitimate voices will be better able to conserve biodiversity, counter environmentally damaging infrastructural projects, and contribute to sustainable development.

10

Land Use Planning and Regulation In and Around World Heritage Sites and Other Protected Areas: A Study of Best Practices and Capacity-Building Needs in Mexico and Central America

George N. Wallace[1], James R. Barborak[2], and Craig MacFarland[3]

[1] Colorado State University
[2] Conservation International, Mexico Central America
[3] Colorado State University

Land Use Planning and Regulation In and Around World Heritage Sites and Other Protected Areas: A Study of Best Practices and Capacity-Building Needs in Mexico and Central America

INTRODUCTION

In many developing countries, the current conservation era is characterized in part by internal and external land use threats to protected areas (Dudley, Hockings, and Stolton, 2003), the decentralization[4] of functions traditionally carried out by central governments (Agrawal, 2001; Ribot, 1999), and changing perceptions regarding the roles of protected areas (PAs) in the landscape (Phillips, 2003, 1998; Hales, 1989). As local governments and civil society become increasingly involved in land use decision-making, the authors propose that this moment in history constitutes an important and unique opportunity to integrate the goals of protected area management and local land use planning. The elicitation study that follows explores this proposal in six Mesoamerican countries.

The intensification of land use near PAs: Intensifying land use near a protected area's boundary (or corridor) has the effect of sharpening ecological and social gradients (Reynolds and Schonewald, 1998; Schonewald-Cox, 1992, 1988), thereby reducing the area's effective size and the opportunities it offers. As land is cleared, divided, and developed, the normal cross-boundary movements of wildlife, plants, natural disturbances, hydrological functions, and energy flows are frequently disrupted. In the United States, land values have increased next to PAs. More compatible ranches and farms providing a relatively shallow ecological gradient (Knight *et al.*, 1995) have been sold, and local governments have approved the subdivision and development of hundreds of thousands of adjacent properties. Such changes typically result in many new roads, fences, structures, artificial lighting, noise, disturbed areas, erosion, impacts to air and water quality, altered vegetative communities, and the introduction of exotic and generalist species and domestic animals that displace endemic or native wildlife (Knight and Landres, 1998; Glick, 1998; Glick and Alexander, 2000). Protected area managers in the USA are now forced to expend a frightening amount of their resources controlling fires, insects, disease, and wildlife (and other natural phenomena) that threaten adjacent private properties. The responsibility for most land use decisions in the USA was decentralized and given to local (city and county) governments in 1928 (United States Department of Commerce, 1928), before development near protected areas was a topical issue. As such, land use decision structures and processes evolved with little collaboration between PA managers and local government. Some efforts are being made to change this (Wallace, 2002, 2001) but high land values and the 'property rights' movement mean that costly economic incentives rather than planning or land use regulations must be used to mitigate development pressures near PAs.

Land use next to protected areas is intensifying worldwide where no one thought it would. It often arrives with the agricultural frontier (Sherbinin and Freudenberger, 1998) and later intensifies with the advent of tourism and second home development (Stonich, 1998; Theobald and Hobbs, 2002). Likewise, many PAs in Mexico and Central America are superimposed on communities and contain considerable private or communal land. In most cases, adjacent land use decisions are not the exclusive domain of the PA managers[5] but are shared with local governments - even in PA buffer zones. As elsewhere, incompatible land uses have the potential to undermine the functioning and value of those PAs, and to create enormous financial and administrative burdens.

The motivation for this study: Over the years the authors have seen a variety of integrated conservation and rural development projects (ICDPs) near PAs in Mesoamerica move through different stages. Land titling, agricultural diversification and marketing, environmental education, community-based ecotourism, and other similar projects were thought for many years to be the best way to stabilize encroachment into PAs, provide options for residents asked to forego the use of resources, and win support for conservation goals. While these have been important projects to which PA managers have given considerable effort, participation is usually voluntary, limited to part of the population, and may only temporarily stabilize land use next to protected areas (Wood, Stedman-Edwards, and Mang, 2000; Barborak, 1998; Hough, 1988; Oates, 1995). Such projects often have the unintended effect of making rural areas more attractive for outside investors (Tosun, 2000) intent on changing somewhat compatible extensive agricultural land uses (agro-forestry, some grazing systems, etc.) to more intensive and less compatible land uses. This stage of development is not conceived in the cooperatives and community associations formed by ICDPs or community-based ecotourism projects; in fact, those who participated in land titling programs and agreed to manage those lands with conservation objectives may quickly sell out when an attractive offer arrives. The upshot is that without access to a legally binding local government land tenure and use decision process, where community members or their representatives (with input from PA managers) can make land use decisions based on their vision for the future, the intensification of land use next to PAs is likely to become increasingly problematic for managers and local residents alike (Tosun, 2000; Clark, 2000).

[4] 'Decentralization' here refers to a country's system of governance and not the decentralization of protected area management.

[5] 'Managers' may be from national, state, NGO, tribal, private, or other designated protected areas.

For some time, the authors have wanted to systematically look at adjacent land uses and land use decision structures regarding protected areas in Mexico and Central America. They have wanted to document land use changes near PAs, and see if decentralizing countries might be able to integrate protected area and local land use planning into new land use decision structures and as responsibility is passed to local government. The authors have wondered if it might be possible to avoid some of the obstacles to cross-boundary collaboration that now exist in the countries that decentralized before the concepts of environmental services, recreation, biodiversity protection, and ecosystem management began to redefine the role of protected areas in society (Phillips, 2003). The authors also wanted to see what kinds of cross-boundary collaboration and land conservation mechanisms were already being used or could potentially be used near the region's PAs. Finally, the authors were interested in the capacity-building that might be needed to address adjacent land use issues.

FINDINGS

National Legal Frameworks Affecting Land Use near Protected Areas

Centralized and decentralized review of development proposals:
Municipalities carry out most non-centralized governmental functions in the countries studied, and their role has been strengthened by recent constitutional reform and decentralization legislation. It appears however that even with the expansion of powers given to local government, national and regional agencies will continue to have a stronger hand in land use decisions than is the case in countries that have long been decentralized. Notwithstanding, national natural resource management and conservation agencies have played an important role in the centralized decision process and even have veto power over land use changes within buffer zones in Mexico and Guatemala. In all six countries studied, the review of development proposals at the municipal level was occurring, albeit sporadically and sometimes circumvented by special interests.

When reviews occur, municipalities that lack the capability or 'real authority' for proposal review have typically forwarded them to national-level public works, health, transportation, tourism, and importantly, natural resource agencies (including PA managers). Where environmental impact assessments (EIAs) are required, PA managers are frequently consulted on proposals near protected areas. Once these reviews are completed, the municipality typically provides administrative approval (often rubber stamp) and issues a building permit. Most study participants felt that the referral of development proposals to conservation professionals would be transferable to the local level as devolution occurs. In Nicaragua for example, the General Environmental Law directs the National Territorial Institute (INETER) to work with the Natural Resources Ministry (MARENA) in developing land use planning guidelines for municipalities as part of the preparation for decentralization.

Use of Environmental Impact Assessments:
All countries studied have national environmental laws and/or other legislation that requires EIAs for public or private proposals above a certain cost. Because the review process at the municipal level is still weak, EIAs have been a widely utilized method of controlling changes in land use affecting PAs in the countries studied. A common complaint was that during a centralized EIA local officials have less influence, as the assessments are usually carried out by a consultant hired by the developer and reviewed by distant central government officials without site visits or adequate consultation with local government or stakeholders. Manipulation of the decision process by powerful national or 'special interest' lobbies was decried as a common occurrence. Only in Honduras and in one state in Mexico (Lybecker and Mumme, 2002) has the Environment Ministry passed responsibility for EIA oversight to larger municipalities with environmental departments. The authors found meaningful public input limited, as in Nicaragua where public review only occurs for three days, in certain offices, where only executive summaries are provided. However in a few countries, legislation now requires governments to publicly disseminate EIA findings and implement mitigation measures.

Legal requirements, definitions, and guidelines for buffer zones and corridors:
While four of the six countries studied now require, and two encourage, the creation of buffer zones for PAs, clear jurisdictional guidelines and regulations are often lacking. The omnibus bill for protecting Honduran cloud forests mandates the creation of buffer zones around 37 cloud forest parks and reserves, about half the total system. Sixteen years after the passage of that bill (1987) however, the majority of these PAs still have not had their final core zone and buffer zone limits defined by specific decrees. Although there are agreements among all Mesoamerican nations to promote a regional corridor network, and tens of millions of dollars are being invested in national and regional biological corridor projects in the region, clear guidelines on what constitutes a corridor and how it should be created and managed remain lacking. Without incorporating such projects into local government planning and future zoning strategies, the former have little chance of surviving over time.

Inter-institutional advisory councils and mandates for cross-boundary collaboration for PAs:
Policy documents guiding PA planning in the region mandate stakeholder participation, open meetings, and inter-institutional plan review; this was previously a top-down exercise done by central office technicians or consul-

tants. In Mexico national environmental legislation (LEEPA) calls for the creation of standing local advisory councils for PAs, and many now exist. Similar local and regional advisory councils are now being established for many Honduran PAs. Such councils provide a way for PAs to take a leadership role on cross-boundary land use issues, even where local governments lack the experience, will, or resources to establish planning or environmental commissions. In several cases studied, these advisory groups have created consultation mechanisms that may well transfer to a legally binding land use decision process as it develops at the local level.

Requirement for municipal land use planning and regulation:
Except for the Mexican states and two autonomous regions in eastern Nicaragua, regional political subdivisions (*i.e.* states, departments, or provinces) in Central America do not play a prominent governmental role. They denote geographical regions, and may have a governor, house some regional offices for national agencies, or be electoral districts; but they do not deal with land use directly. As with most decentralizing governmental functions, land use planning and decision-making is carried out by municipalities.[6] The authors found a slow but increasing emphasis on developing local master plans (often called *planes reguladores)*, zoning, and procedures for local development review, though there are still few examples of these in the rural towns near most protected areas. This usually begins with urban development plans in larger towns, and is slowly expanded to include entire municipalities as local planning capabilities improve. The updated municipal laws in most nations studied create local planning and development and/or environmental advisory boards that are named by local mayors or municipal councils. Protected area managers and staff may (but are not usually required to) participate. Municipal councils frequently retain the quasi-judicial functions of a planning commission, but such commissions can now legally emerge as local governments and advisory groups mature. Improved land registration systems (see below) are strengthening the role and interest of local governments in land use planning and regulation. New general environmental laws and legislation guiding PA management now encourage cross-boundary planning and coordination with other national agencies, local governments, and stakeholders. In Mexico and Guatemala, PA managers have veto power over development proposals in a PA buffer zone, although this power is seldom exercised. Recent national environmental legislation in Mexico requires that PA managers join with municipalities and other agencies in a bio-regional planning process, where all jurisdictions must plan at the landscape level. Sixty percent of these plans have been completed to date but only ten percent are functioning well.

Decentralization of cadastre systems and revenue streams:
Land and title registry, which has long been managed at the national level, is being transferred to local governments in Costa Rica, Honduras, Nicaragua, and Guatemala. In Mexico it remains at the state level, and Panama retains records at the national level. Concomitantly, control over revenue from land taxes and a limited number of other taxes is being given to local governments, which have historically been dependent on transfer payments from central government treasuries (albeit at lower levels than constitutionally mandated). Major investments, often supported by multilateral and bilateral aid agencies, are building the capacity of local governments to assume these functions. Assistance with geographic information systems, land surveys, titling, replacement of outmoded land registration systems, and staff training has been provided to help cash-starved local governments determine the land values and real estate taxes that help fund land use planning and other services. Focus group participants noted that inadequate revenue leads local governments to promote, or at least permit, unsustainable development projects. Land titling and registration has helped to stabilize land use near some PAs studied, and provides land managers with improved information regarding ownership for PA in-holdings, buffer zones, and corridors. Participants often stated that encroachment into PAs will continue until ownership is stabilized. Unfortunately, the authors found no titling programs that placed restrictions defining compatible uses on lands adjacent to PAs at the time of titling, even when titles are given to former squatters.

Support agencies for municipality strengthening:
Most nations studied have created a central government agency charged with providing technical assistance to municipalities. This study found, however, that there was confusion regarding which agencies were responsible for it. In addition, municipalities have themselves created national and regional umbrella groups (see below) to improve their planning capacity and defend their interests. These groups, in addition to training local government staff, provide technical assistance, develop guidelines and procedural manuals, and assist in obtaining access to international funding for municipal and regional planning and capacity-building.

Regional planning and management for multiple municipalities:
Legislation in most countries studied now also permits groups of municipalities to form *mancomunidades* [commonwealths or municipal councils] where economies of scale or the shared nature of problems make such cooperation appropriate. For example, in Honduras the municipalities surrounding the Lake Yojoa basin, a multiple-use conservation area including parts of two national parks, have formed such a group called AMUPROLAGO, which has a co-management agreement with the government forestry corporation for management of the watershed. It

[6] *Municipio*, or municipality in Spanish, denotes a sub-region equivalent to a county or township in some countries. Several countries like Mexico also have *ejidos* and/or *tierras communales* - lands held collectively by some or all community members respectively. Although these lands are subsumed by municipalities, they carry some long-decentralized land use decision powers that were given at the time of their creation.

is funded by a share of the land taxes from each member municipality. In Mexico, the new national environmental law (LEEPA) calls for the development of bio-regional land use plans to guide the municipal planning process, including guidelines for compatible land use in PA buffer zones.

Legislation regarding private and municipal reserves and forest concessions:
Recent reforms in municipal laws in most of the countries studied either directly or indirectly provide municipalities with the power to create municipal protected areas, and to work actively to conserve and improve the environment within their jurisdictions. While many of the wealthier and more populated municipalities have created municipal planning and environmental departments, few have yet to create municipal parks and reserves systems. Through the initiative of a number of individuals, corporations, and NGOs, the number and total size of private protected areas in the countries studied has expanded rapidly in recent years. Several countries including Costa Rica and Guatemala specifically authorize the creation of private reserves, some of which can qualify for inclusion in the national PA systems. Other nations provide tax exemptions, environmental service and trail payments, or law enforcement assistance in dealing with squatters to those landowners who voluntarily conserve their properties. National associations of private reserves have been established in several nations. Many of these 'private PAs' are located adjacent to, or in, buffer zones and conservation corridors around and between designated PAs, and can help reduce the fragmentation and isolation of national PAs. However, few private reserves have initiated a plan for perpetual protection. Guatemala passed legislation enabling the creation of forest concessions (for 25 years, renewable if performance criteria are met), which are granted to local community groups that agree to do land use planning and steward forest resources. Such plans call for community site planning, but have thus far focused on resource utilization and not the impacts caused by the settlements themselves.

Conservation easements and transferable development rights:
In all the countries studied except Panama, the authors found that modified conservation easements are allowed, but usually through recent court interpretations of existing civil code (contractual) provisions regarding easements, which are not as flexible for conservation purposes as easement-specific enabling legislation elsewhere. In Guatemala easements are not permanent, which limits their usefulness as a conservation tool. In Honduras, the first conservation easements were recently developed in the Lake Yojoa watershed to protect an important micro-watershed. Only in Costa Rica are easements being used, together with environmental service payments, to support private reserves. In Mexico innovative legislation is being developed for the transfer of development rights from sending areas needing protection to receiving areas designated for more intensive development.

National environmental service payment programs:
There has been considerable interest recently in how to internalize the costs of conservation, specifically within mechanisms for compensating both private landowners and PAs for the environmental services (such as carbon sequestration and water production) that they provide; Costa Rica has become a leader in such efforts. Using a combination of debt for carbon swaps, a fuel tax, and international donations, the government has established an environmental service payment system to compensate private landowners (including conservation NGOs) for maintenance or restoration of forest cover and for sound land stewardship practices. Since demand for the program exceeds available funds, regional conservation areas in Costa Rica each prioritize payments based in large part on the buffering and corridor functions of eligible private parcels.

Environmental law groups:
In all of the countries studied, national environmental law NGOs have recently been established. Rather than emphasizing litigation, these groups tend to assist with the creation or improvement of legislative frameworks and capacity-building for conservation. They have formed regional and extra-regional alliances to train judges, law enforcement, and PA personnel, law students, government agencies, and citizen groups regarding best practices and minimum standards for environmental legislation. They have also published and disseminated easy-to-read documents on environmental law, conservation easements, and coastal zone legislation (Paniagua Alfaro and Villalobos Molina, 1996; Ferroukhi, Aguilar, and Wo Ching, 2001), and have provided assistance to NGOs, private landowners, and municipalities on conservation planning.

Case Studies: Adjacent Land Use Decisions in 16 Protected Areas

Once national legal frameworks were better understood, the authors wanted to know what was actually happening on the ground and/or how PA managers were dealing with adjacent land use decisions. Numerous national-level participants in this study forewarned that the body of law has outpaced actual practice. Although the space allotted here does not allow for a detailed account of the case studies (these will be published separately), Table 3 summarizes the adjacent land use impacts described by case study participants, and Table 4 describes the 'mechanisms' that managers used to address incompatible land uses near PAs.

Two major findings and challenges emerge from the information provided by study participants - most of whom are experts in their own right. First, although there is confidence regionally that the planning and development review and decision processes will be transferred to local government, and that it is very likely that PA managers will be able to participate, there is still limited confidence that the

Table 3. **Type and frequency of impacts from inappropriate land uses within or adjacent to 16 Mesoamerican PAs or designated corridors (as described by case study participants)**

Impacts	Protected Areas affected	Frequency
Inappropriate tourism development	Tikal; Copan; Chocoyero; Manuel Antonio; Bastimentos; Gandoca-Manzanillo; Sian Káan; Pinacate	8
Proliferation of vacation homes	Yojoa; Bastimentos; Chocoyero; Manuel Antonio; Gandoca Manzanillo; Sian Káan; Pinacate	7
Intensifying agricultural encroachment by squatters or intensification of private property	Uaxactún; Bosawás; Bastimentos; Barú; Manuel Antonio; Soberanía	6
Unplanned or inappropriate subdivision of land, often purchased by outsiders and foreigners	Tikal; Gandoca-Manzanillo; Sian Káan; Pinacate	4
Approaching urbanization	Copan; Pinacate; Manuel Antonio; Sian Káan	4
Illegal, unplanned, or poorly designed or located roads	Copan; Yojoa; Barú	3
Clearing of forest for logging, grazing	Uaxactún; Yojoa; Bosawás; Manuel Antonio	3
Unlicensed vendors with makeshift stands	Yojoa; Tikal; Pinacate	3
Airports and over flights, illegal landings	Uaxactún; Copan; Pinacate	3
Runoff from agrochemicals and concentrated animal wastes affecting rivers, groundwater, and/or costal zones	Manuel Antonio; Soberanía; Gandoca-Manzanillo	3
Solid waste from nearby population centres accumulating on beaches, shores	Barú; Bastimentos; Gandoca-Manzanillo	3
Mangrove and/or coastal dune destruction	Manuel Antonio; Bastimentos; Sian Káan	3
Road-kill of wildlife from adjacent roads	Barú; Pinacate; Sian Káan	3
Billboards and advertising	Tikal; Pinacate; Sian Káan	3
Trespassing, drug cultivation, and smuggling emanating from adjacent private lands, resorts	Pinacate; Bastimentos; Bosawás	3
Plans for an international highway through the Petén	Uaxactún; Tikal	2
Highly visible communication towers	Copan; Pinacate	2
Mining	Bosawás; Pinacate	2
Urban or industrial sewage contamination of rivers, groundwater, and costal zone	Manuel Antonio; Bastimentos	2
Solid waste dumping at reserve boundary	Tikal; Pinacate	2
Sand and gravel extraction from beaches, marine reserves, and rivers	Manuel Antonio; Gandoca-Manzanillo	2
Use of area by military	Uaxactún	1
Tanks, ponds, cages built for raising of exotic fish	Yojoa	1
Border with USA causes PA to be used as crossing point - fatalities	Pinacate	1

Table 4. **Mechanisms used in/near 16 Mesoamerican protected areas to reduce the threats from adjacent land uses[1]**

	1.Pinacate 2.Monarca 3. Sian Káan			4.Uaxact. 5.Tikal		6.Copan 7.Yojoa 8.La Tigra			9.Man.Antonio 10.Gandoca 11.Baru			12.Soberan. 13.Bastim.		14.Choco. 15.Bosaw.	
Mechanisms being used	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Maps/database explaining adjacent land uses and ownership near the protected area		X	X	X		X	X	X		X	X	X	X		X
Management plan (MP) directs, or staff is assigned (SA) to, tracking of land use proposals on adjacent lands		X	MP/ SA	X		X	X		X	X	X	X	X		
Designated buffer zone (BZ) or coastal protection zone (CP)	CP/BZ	BZ	BZ	BZ	BZ	BZ		BZ		CP	CP		BZ	BZ	BZ
Established criteria for land uses in the buffer zone	X	X	X	X	X	X		X		X			X		X
Municipal master plan (MP)/land use code (LUC) with prescribed zoning and permitted uses next to or within the PA		MP	MP LUC			MP									
Local development (DC) committees, environmental committees (EC), or watershed committees (WC) that advise elected officials	DC			X	DC	X	WC								
Protected area has citizen advisory committee			X	X		X	X		X	X	X		X	X	X
Bioregional (BP), regional master plan (RP), regional tourism plan (TP), or corridor plan (CP) to guide municipal plans	BP		BP	BP		RP			RP	CP	CP		TP		RP/ TP
PA staff are participating in the local planning (P) and development review (DR) process			P	P		X	P/ DR		X						X
Municipal PAs exist							X						X		
Agricultural extension diversification/stabilization programs used to reduce encroachment into PA		X	X	X			X	X		X		X		X	X
Resettlement of populations living within or next to PAs					X										
Increased patrolling and enforcement of regulations prohibiting squatters in PAs	X	X		X			X				X	X	X	X	
Land titling, registration (LT) or land concession (LC) programs that target populations within/near protected areas			LT	LC			LT			LT		LC	X		
Perpetual (PE), contractual (CE), or temporary (TE) conservation easements						TE					PE				
The purchase (P) or transfer (T) of development or use rights are used to reduce the impacts of adjacent development		p	T												
Commonwealths (C), or intergovernmental agreements (IG), are used to enhance land use decision-making or to buffer PAs	IGA		IGA				C/ IG								
Financial mechanisms such as endowments (E), reforestation or environmental service payments (ES), or taxes (T) are used to improve neighbouring land uses or purchase in-holdings		E					ES		E	ES	ES	ES			

[1] Upper case letters denote that mechanism is being used; lower case letters denote sporadic use, or that the use of the mechanism is just beginning.

decentralized land use decision process will be honoured by special interests or all elected officials. Secondly there is a lack of confidence that beyond master plans, a land use code with specific zoning, permitted uses, and performance criteria will be developed. Since land use codes are the basis for decision-making in most countries and, if followed, tend to quell abuses by decision-makers, these two findings suggest a basic lack of confidence that the 'rule of law' can prevail.

DISCUSSION AND RECOMMENDATIONS

The Potential for Wide Integration of Best Practices into Land Use Decision Structures

The authors encountered a diverse array of practices and projects being used to improve land use planning, regulation and stewardship in and around protected areas in all six Mesoamerican countries. No single country or protected area could be said to have an integrated approach for anticipating and mitigating incompatible adjacent land uses, or to draw on a full range of the techniques identified either by this study or in the literature. Even in those countries with more advanced legislation and programs, and greater levels of investment in improved land use planning and management around PAs, there is at best sporadic knowledge about, confidence in, and implementation of best practices - at least for the 16 case study PAs. For protected area managers to be able to influence significant adjacent land use decisions on a continuing basis requires a stable, enforceable local planning and development review process, in which PA managers can legitimately participate. During the impending and historically unique period of decentralization, managers must participate in both their own capacity-building and that of civil society if cross-boundary collaboration is to become institutionalized within a trustworthy, inclusive, proximate, and democratic land use decision process that incorporates local knowledge and institutions. Only then can we expect that a more complete set of the best practices encountered will be integrated and applied consistently (Few, 2000; Borrini-Feyerabend and Buchan, 1997; Mumme and Korzetz, 1997). It is the authors' observation and that of others (Sundberg, 2002; Brocket, 1998) that this will be more difficult and more important for those PAs that were originally designated without consultation with local communities, or in regions that have been subject to warfare or government and/or corporate repression; this was the case in Guatemala's Petén and parts of Nicaragua and Panama during the study.

What To Do As Land Use Decision Structures Decentralize

There are things that managers can do while the local land use planning process matures: A) The stage can be set for cross-boundary reciprocity with the creation of protected area advisory groups, allowing local input on land uses and management actions within the protected area while participants simultaneously become more familiar with the PA's mission, management objectives, and the issues related to its boundary or buffer zone. B) Managers can designate staff that will begin tracking, mapping, and analyzing adjacent land uses, especially in sensitive areas where changes in the ecological gradient would be most detrimental (Wallace, 2001). C) If these are not already in place, managers should be ready to participate in the development of local or regional master plans and land use codes, paying special attention to the zoning, permitted uses, and development criteria that are proposed for lands in the buffer zone or adjacent to the boundary. D) Of special importance is the refinement of a more decentralized review and decision process that will institutionalize input from PA managers when changes in land use (land subdivisions or development) are proposed near protected areas, and will allow reviews to be tracked. E) Managers can become familiar with the new legal frameworks, land conservation tools, best practices, and obstacles that were identified in the course of this study.

The Good News for Protected Areas

The challenges of creating communities that regulate and control development activities via a civil society that has confidence in its own empowerment, and through a participatory, transparent, and enforceable democratic decision process, are considerable (Blair, 2000; Nepal, 1997). But they are essential for any landscape or ecosystem approach to conservation. Conservation professionals need not take the lead in improving civil society, but they must help. The authors' findings suggest that many Mesoamerican PA managers are in a better position to participate in and influence local land use decisions than their counterparts in decentralized countries. In the United States and Canada for example, local governments became developed and very autonomous prior to the era of conservation planning (Platt, 1996). Property rights groups and high land values in these countries make changes in zoning or land use regulations that favour PAs difficult (Glick, 1998). In the study area the combination of buffer zone legislation, the tradition of including PA managers in the referrals for EIAs, and the prevalence of integrated conservation and rural development programs (ICDPs) near protected areas may have a cumulative effect, namely of giving PA managers a legitimate seat at the land use decision 'table'. To institutionalize this potential at the local level means bolstering investments that improve local land use planning, regulation, and cross-boundary stewardship capacity. This capacity-building is needed nearly everywhere and must be proactive rather than reactive, since it is more easily implemented *before* PAs and their surrounds are 'discovered' and subsequently experience increases in tourism, land values, outside investors, enclaves, and rapid in-migration (Tosun, 2000; Trousdale, 1999; Wallace and Pierce, 1997).

Capacity-Building Recommendations

The authors encountered little investment in individual, institutional, or sector-wide capacity-building for sanctioned land use decision structures, or decentralized governance in general. The adoption of many of the best practices encountered during the study will require moving beyond the voluntary ICD projects that were observed and investing in the development of local institutions that can make and enforce legally binding decisions (Nepal, 1997). Target audiences for capacity-building aimed at integrating PA objectives and local land use decisions should include PA professionals, municipal planning staff citizens groups, and those national and multinational entities providing technical, financial, and legal support to local governments; they should also include environmental law groups, extension agents, NGOs that have focused on voluntary ICDPs, and academics among others. The following topics should be considered for inclusion in capacity-building activities (*i.e.* short courses, study tours, manuals, websites, and distance learning, workshops, and conferences):

Improving governance and the participation of civil society:
Topics of importance include stakeholder participation, creation and training of citizen boards and commissions, meeting and public hearing skills, the use of due process, balancing administrative procedures with citizen advisory groups, transparency, trust in the rule of law, accountability, public records, use of ombudsmen, appeals courts, and inter-jurisdictional agreements (Blair, 2000; Trousdale, 1999). Efforts should be made to blend new decentralized governance mechanisms with traditional or indigenous governance mechanisms within decentralized decision structures (Borrini-Feyerabend and Buchan, 1997). Discussion regarding what forms of governance should remain centralized, and how to phase decentralized governance, will be critical.

Planning and land conservation tools:
Capacity-building should help a wider array of people learn about what goes into legally binding mechanisms such as master plans or land use codes, how they interact, and what land use tools and best practices are available for implementing them. This should include both regulatory (zoning, performance criteria, phased infrastructure, fees, etc.) and market- or incentive-based land conservation techniques (easements, purchase or transfer of development rights, tax incentives, certification, municipal and private reserves, environmental service payments, etc.).

Incorporate cross-boundary activities into protected area management plans:
Define buffer zones, conduct PA boundary analysis (USDA Forest Service, 2001), locate corridors, and develop specific outreach programs that include staff participation in local planning and review of development proposals. Open this PA planning process to local governments and adjacent landowners.

Creation of inter-institutional mechanisms for land use decisions:
Improve local government's ability to oversee the review of development proposals using an inter-institutional, and when warranted, cross-boundary referral process that includes conservation professionals and citizen boards. Likewise, foster newly formed PA advisory councils and seek their input on management actions near the PA boundary, to set the stage for a reciprocal review of adjacent land uses by PA staff.

Strengthen and diversify revenue streams for local government.
Even though more are being enabled, many communities are not used to paying or managing sales taxes, special district taxes, or even fees for services. New taxes must be created, used wisely and seen favourably by those who pay if local governments are to function and provide decentralized services. Citizens must understand the strategies used for environmental service payments.

Pilot and prototype projects:
PAs and municipalities should create multi-year efforts to produce compatible municipal land use plans and park management plans, and employ a full range of best practices during a trial period.

Refinement of national enabling legislation:
In some countries, enabling legislation for buffer zones, corridors, easements, and private and municipal reserves is still lacking or unclear. Where it is lacking, clarify that the devolution of authority to local government must include a mandate to prepare and implement municipal land use plans and codes, and a development review process with more local responsibility for EIAs. Enable the use of appointed boards or commissions that are quasi-judicial or that advise elected officials, thus providing checks and balances and trust in democratic decision-making. Where none exists, legally enable a local government cadastre and land registration system accessible to all. Titling programs should be enabled to limit type of use and density for those lands titled adjacent to PAs or within biological corridors. National environmental legislation should be in place to both guide and restrain local decision-making with minimum standards for shared resources such as air quality, water quality, and biodiversity. As study participants have emphasized, local governments must be allowed to create new revenue streams if decentralization is to succeed. Most municipalities are only empowered to levy property taxes and a few fees for services.

Protection vs. Integrated Conservation and Development Projects (ICDPs)

There is currently a debate in international conservation circles over the extent to which protection measures, usually by central governments, can stem external threats to protected areas in developing regions (Wilshusen *et al.*, 2002; Rabinowitz, 1999). Some authors such as Van

Schaik and Kramer (1997), Terborgh (2000, 1999), and Oates (1999, 1995) cite the failures of voluntary ICDPs to protect biodiversity, and argue for a strengthened emphasis on law enforcement. Others believe this approach is doomed because it will increase conflict and alienate allies, and that the political will for such a solution is usually lacking (Wilshusen *et al.*, 2002; Phillips, 1998). Both views overlook the importance of participating in the development of local government land use decision structures as the most logical middle ground. All but the largest protected areas exist in a wider landscape dominated by human-altered ecosystems, and even where stronger protection measures are put in place, the ecological viability of most protected areas will depend on bio-regional and local land use planning, code enforcement, efforts to instil a land (and sea) ethic, and the promotion of land and resource stewardship beyond protected area boundaries. Where cross-boundary collaboration that benefits PAs is achieved, it will be in large part through strengthening the capacity of local government to integrate voluntary conservation and development projects, best practices for land use planning, and land use regulations that buffer PAs into emerging governance structures. Many have forewarned that the landscapes around PAs are likely to become more and more fragmented and intensely developed, leaving them as islands in a sea of incompatible land uses. National-level officials and PA managers in the study area have begun to address these issues in a variety of ways which, collectively, have provided some directions for the work ahead.

The Specific Challenges of World Heritage Sites and their Adjacent Lands

The listing of a protected area on the World Heritage Convention increases the responsibilities of a nation to adequately protect and manage such a site, be it a natural area, cultural park, or a site with combined natural and cultural features of global significance such as Tikal in Guatemala. There is growing recognition that many World Heritage sites, both natural and cultural, and particularly World Heritage forests, are threatened by inappropriate land use in surrounding landscapes (Pedersen, 2003; Shackley, 2000). There is also concern at an international level that to adequately conserve the globally significant resources of World Heritage sites, their managers and other land management authorities must redouble efforts to adequately plan and manage land use at the landscape scale, or 'beyond the boundaries'. This study shows that managers of the existing World Heritage (WH) sites included in the study (Sian Káan, Tikal, and Copán), the proposed WH sites (Soberanía in Panama and Bosawás in Nicaragua), and other reserves that constitute buffers or corridors adjacent to World Heritage sites (Uaxactún, adjacent to Tikal; and Gandoca-Manzanillo in Costa Rica, part of a corridor stretching from the La Amistad Biosphere Reserve/World Heritage site to the Caribbean coast), are using a variety of innovative techniques to deal with adjacent land use issues.

Yet the overall variety of techniques used, or their relative success, does not differ significantly from that at other PAs not listed as World Heritage sites or adjacent to them. In fact, the focus group results for Tikal in Guatemala, which has been legally protected for nearly 50 years and where the southern flank, in spite of being part of the buffer zone of the vast Maya Biosphere Reserve, has been nearly totally deforested in recent years, showed the greatest pessimism of all the areas studied regarding the feasibility of adjacent land management strategies.

ACKNOWLEDGEMENTS

This report was originally prepared for presentation at the Vth World Parks Congress Capacity Development Workshop in Durban, South Africa, September 2003. While space does not allow for a listing of all names, the authors are deeply indebted to the over 100 individuals and institutions that helped plan, and participated in, the six national and 16 protected area-specific case studies. The authors thank the USDA Forest Service International Programs and the Consortium for International Protected Area Management (CIPAM) for their financial support of this study, and Colorado State University and The Wildlife Conservation Society for supporting the research team. The authors also appreciate the opportunity given to them by Dr. Julia Carabias and the organizers of the Capacity Development Workshop to present a portion of their results in Durban. Finally, the authors are grateful for the opportunity, provided by UNESCO and the World Heritage Centre, to participate in the Berestagi + 7 Workshop on 'Contributing to Forest Conservation and Sustainable Development' held in Nancy, France, in March 2005, and to contribute to the current volume.

11

Landscape-Level Considerations in Protected Area Management: What We Have Learned

Ryan Finchum[1], George Wallace[1], Craig MacFarland[1]

[1] Colorado State University

Landscape-Level Considerations in Protected Area Management: What We Have Learned

After some 16 years of doing capacity-building, research, and training in the protected areas of the Americas, all of us here at the Centre for Protected Area Management and Training at Colorado State University (CSU) are concerned that in spite of all the discussion about gap analysis, ecosystem management, cross-boundary management, biological corridors, and the like, the majority of protected areas (PAs) still do not often look beyond their designated boundaries. Even if they do have a larger view or a desire to work across boundaries, many are still at a loss as to how to go about influencing the land use decisions that could in fact buffer their protected area or connect them across a larger landscape. Some countries, such as Brazil and Costa Rica, have taken a large landscape approach in designating protected areas that represent a full range of ecosystems, or identifying larger multiple-unit 'conservation areas' with potential connections between protected areas. In spite of this, it has been our observation that most individual protected areas are becoming ever more ecologically isolated in a sea of increasing development. They are becoming, or will become, magnets for intensified land uses outside their boundaries (and on private or communal land within their boundaries) that will fragment or cause ecological gradients with the surrounding landscape to become steeper. This is especially true of protected areas in stable countries with better access, higher levels of infrastructure development and visitation, or special designations (World Heritage, RAMSAR, etc.), or promotion as notable ecotourism destinations.

Interestingly, although development is increasing and producing more fragmentation around existing protected areas, the creation of private and local government protected areas is expanding protection across some landscapes and into heretofore unprotected potions of those landscapes. In some cases these new areas serve to buffer or help connect existing protected areas. All this is happening at a time when responsibilities for land use decisions - or what the larger landscape will ultimately look like - are being decentralized and passed down to local governments that do not yet have the decision structures or experience to make land use decisions. This can be both an advantage and a disadvantage. It is also taking place during a time of complex institutional arrangements regarding who ends up managing protected areas and what combination of national, state, NGO, private, or donor support they receive. We note that institutional arrangements also have the potential to fragment a large landscape view as diverse entities vie for resources and influence, and as national systems struggle to emerge as visible unifying entities.

In response to all of this, our Centre has tried to incorporate new research, new types of partners and participants, and new content into the research, courses, and technical collaboration that we are involved in. We have learned for example that we would be wise to:

- Include course participants from a wider array of protected areas, including local government and private protected areas, so that they are seen as important players alongside those from larger national parks, forest reserves, or wildlife refuges. We also try to include one or two youth participants who show potential as innovators and leaders, and who are still forming a vision of what protected area management is about.
- Pair NGO participants with their government counterparts as we select course participants, in order to emphasize that in the long run it will be national, state, or municipal systems who have the jurisdictional authority and decision power for managing public protected areas - even if the government organization is the weaker portion of the partnership. As we have done with a series of ranger training courses in four Andean countries, we also try to include all those who are managing protected areas and any semblance of a national capacity-building strategy (being developed in response to the Protected Area Programme of Work for the Convention on Biological Diversity developed during the COP7) in our planning for capacity-building, even if the funding is from a specific NGO or agency. We do these things to reduce institutional fragmentation and make a large landscape and unified approach more likely.
- Focus on the development of centres of excellence for training (that go beyond requests for training from specific protected areas), which take a larger landscape or protected area system approach. This follows the Durban Accords related to capacity-building. We think that each country should have such centres, linked to universities that are committed to the type of long-term training for PA managers that can weather the changes in government administrations and external funding that often undermine capacity-building efforts. In Mexico, CSU has embarked on a three-year program to help strengthen a university-based alliance of training partners including the federal and state protected area agencies and NGOs (with funding from USAID and the U.S. Forest Service as well as from the partners). Such centres are more likely to take a larger landscape approach to capacity-building than many site-specific programs do.
- Include (during our field courses and workshops) examples of real and successful ecosystem management and cross-boundary collaboration between entities. For example, during our five-week summer course for protected area managers from Latin America, we now include a seven-day exercise along a river corridor where four land management agencies (National Park Service, Forest Service, Bureau of Land Management, Bureau of Reclamation) have had to collaborate in order to address issues related to river flows, water quality, endangered species, concessions management, and the invasion of exotic species. During this trip, students must play the role of an interagency management team that establishes shared desired

future conditions, indicators and standards for a set of prioritized issues, and management actions and a monitoring protocol to address those issues. They meet with agency representatives to gather information and perspectives throughout the trip. Five of these days are spent on a working float trip down the Gren River, passing through each protected area and agency jurisdiction.

- During the same course, we also spend time (on another field trip) meeting with partners in a 'Mountains to Plains' corridor that is being formed and managed in an integrated fashion by several units of local government open space as well as private lands conserved through easements. We learn about the coordinated designation efforts, their revenue-sharing strategy, and future plans for co-management that include a livestock grazing association in order to manage a short-grass prairie ecosystem that evolved with grazing by bison.
- Include more units (during training) on land use decisions outside protected areas. We utilize a variety of activities to stress the importance of linking protected areas with local government/municipal land use decision structures and programs and emphasize the importance of participating in and 'greening' these newly forming processes before they crystallize and are taken captive by special interests. We talk about the importance of planning and zoning outside of protected areas that reduces the potential intensity for development next to and between protected areas, concentrating or clustering development, transferable development rights, conservation easements, conservation buyers, land banking and other techniques that protected area mangers can put on the table for the consideration of local officials or indirectly broker. These are ultimately the tools for large landscape conservation as the possibilities for designating new protected areas diminish.

Meanwhile the applied research done by Centre affiliates and graduate students is looking at the effects of adjacent land use, private land conservation, and cross-boundary collaboration on protected area management so that we have good data to share with managers in the field and upon which to base a variety of training activities. We are currently using such research to conduct collaborative planning on a large landscape matrix of federal, state, and private land on the Pawnee National Grasslands. We have done an analysis of the legal framework for land use decision-making in six countries in Mesoamerica, and of the effects of adjacent land use around 15 protected areas and the best practices within those countries (a summary of which appears elsewhere in the materials to emerge from the Nancy meetings). We have done research at the Copan Ruins and other sites on the effects of internal and adjacent development on the setting, and the experience of visitors; this to emphasize the importance of looking across boundaries and working with local government at World Heritage individual sites. We have also worked with six units of local government and the White River National Forest in Colorado in order to develop a collaborative model for dealing with the cross-boundary and large-landscape issues there.

We hope that these combined efforts continue to contribute to a larger landscape view of protected area management among those we work with. We intend to incorporate new activities and training materials as we learn, both from our own experiences and those of others.

12

Capacity-Building of Managers in Multi-Use Landscapes: Recent Experiences of CATIE in Sustainable Forestry Management

Glenn Galloway[1]

[1] *Centro Agronomo Tropical de Investigation* (CATIE)

INTRODUCTION

During the past 15 years, the Tropical Agricultural Research and Higher Education Centre (CATIE) has collaborated on a number of initiatives contributing to the capacity-building of key actors involved in sustainable forestry management (SFM) in multi-use landscapes in Central America. In Honduras and Nicaragua for example, CATIE participated in the establishment of 'operational networks of horizontal cooperation' bringing together diverse entities from the public and private sector, producer groups, technical schools and universities, non-governmental organizations, and research and development projects, among others. These networks have sought to advance the SFM of lowland, humid tropical forests in both countries through research, training, and technical assistance activities. These forests often form part of the buffer zones of protected areas located in national parks and biospheres (Pico Bonito National Park and WHS, Río Plátano Biosphere Reserve). In the Petén in Guatemala, CATIE has been closely involved with the community concession process, helping to develop the politico-legal framework for community concessions and carrying out a large number of capacity-building activities to strengthen the process. Community concessions now account for several hundred thousand hectares of certified forest under management in the Multiple-Use Zone of the Mayan Biosphere.

CATIE has also offered annual strategic courses, including 'Protected Areas Management' and 'Diversified Management of Tropical Forests', for the past 27 and 17 years respectively. The experiences and lessons learned from these and other initiatives provide the principal input for this paper. The primary focus of these initiatives has been to improve the SFM of tropical and subtropical forests as a means of forest conservation and to contribute to poverty alleviation in marginalized regions of Central America. CATIE has made an important contribution to these objectives, in conjunction with a wide range of organizations and key stakeholders in Central America.

Finally, one may question whether capacity-building in SFM contributes to the integrity of protected areas (PAs). Tangible evidence indicates that SFM in forested areas adjacent to PAs can indeed contribute to their integrity. Examples supporting the positive relationship between SFM and PAs are provided in the latter part of this paper.

THE CHALLENGES OF CAPACITY-BUILDING IN A MULTI-USE LANDSCAPE

Over time, the multidimensionality and complexity of SFM in a multi-use landscape has become increasingly clear. Experience has shown that capacity-building must address diverse aspects, including those that are:

- Social and organizational
- Technical and ecological
- Related to rural enterprise development
- Political-legal, and tied to governance

Within each of these broad categories, a wide range of topics often needs to be addressed in a capacity-building program.

With regards to *social and organizational* aspects, rural community groups often recognize the need for strengthening their internal organizations in order to take on forest management and other land-use activities in a successful manner. In the Mosquitia Region of Honduras, for example, indigenous groups requested support to better understand the comparative advantages of distinct forest management organizational models from legal and taxation perspectives. In this case, positive and negative experiences of community organizations in Honduras were documented and shared in workshops with representatives of the indigenous groups. Community-based forest enterprises require that community members possess a considerable number of capabilities, ranging from strategic and operational planning to the know-how required for carrying out effective negotiations, conflict management, accounting, and administration. Exposure to equity and gender issues has also proven to be important.

From a *technical and ecological* perspective, capacity-building needs are also quite extensive (see Table 1). In the past, forestry development projects tended to concentrate on the technical aspects of capacity-building, sometimes at the expense of other capacity-building needs. Because SFM processes are relatively new, information generated through the realization of forest inventories, research, and monitoring and evaluation activities should be used to improve the content of technical and ecological capacity-building activities over time.

In recent years greater effort has been made to focus capacity-building initiatives on topics related to *rural enterprise development*. As has been mentioned above, past initiatives have tended to focus on the technical and ecological aspects of SFM and to ignore other concerns crucial to rural enterprise development. Numerous instances could be cited where community-based forest management has been successful technically, but not commercially. Examples of important topics in this category are listed below in Table 2.

Table 1. **Partial list of technical skills required for forest management**	
Quality management of wood and non-wood products	- Selection and grading - Local processing - Stacking and drying - Transportation
Management of tropical broadleaf forests	- Ecological and economic considerations - Forest inventories - Management plans - Silvicultural treatments - Cost-benefit analysis - Organization of forest management - Fire control - Control of illegal logging
Low-impact harvesting techniques	- Roads and skidder trails - Directional felling - Prevention of accidents - Technical evaluation of harvesting operations - Equipment operation and maintenance

Table 2. **Partial list of skills required for the management of forest enterprises**	
Organization of forest enterprises	- Intra-business organization - Inter-business organization - Vertical integration vs. vertical alliances - Trust relationships with service providers and other actors along the supply chain - Institutional arrangements ensuring information flow and more equitable distribution of benefits
Administration	- Strategic and operational planning - Financial planning and management - Personnel management - Market analysis and marketing management - Product development - Quality control - Procurement and purchases - Auditing - Reporting and documentation
Certification	- Individual vs. group certification - Opportunities - Requirements - Costs and benefits - Chain of custody - Documentation

Finally, aspects pertaining to *politico-legal and governance issues* are increasingly important. Community groups are typically poorly informed about elements in the political and legal framework that directly affect the viability of their community-based operations. During planning sessions with indigenous groups in the Autonomous Region of the Northern Atlantic of Nicaragua for instance, community representatives expressed a desire to understand the content and purpose of forest management plans required by law, and the political and legal framework relevant to forestry development. Governance issues are also quite important for furthering SFM in multi-use landscapes. Institutional corruption, illegal logging, deficient law enforcement in rural areas, and unfair (and illegal) taxation schemes endanger the viability of SFM in many regions of Central America. Consequently, capacity-building initiatives that focus on these matters are extremely important.

THE IMPORTANCE OF COOPERATION AMONG DIVERSE STAKEHOLDERS

Recognition of the multidimensionality and complexity of the sustainable management and conservation of natural resources was one factor that led to the formation of the operational networks for horizontal cooperation described earlier. Once initial enthusiasm generated by the founding of the networks had waned, many network members felt that cooperative efforts required more direction (Galloway, 2000). In response to this concern, representatives of the Network for the Management of Broadleaf Tropical Forests in Honduras (REMBLAH) took the initiative of forming 'working groups' and later 'commissions' to ensure that adequate attention would be given to specific complementary dimensions of SFM within the network. As a result commissions were formed to address Community Development (social and cultural aspects of SFM), Forest Management (technical and ecological dimensions of SFM), and Industry and Commerce (economic and commercial aspects of successful SFM). An additional commission now devotes attention to political and legal issues, in order to provide the network with a voice in political and legal debates affecting the viability of SFM in Honduras.

This structuring of REMBLAH into commissions resulted in several tangible benefits:

- Each member organization became part of the commission(s) that most relates to their area(s) of interest and expertise. In this way, it was possible to channel the contributions of each member more effectively.
- During strategic planning exercises, it was possible to define shared long-term visions and prioritized strategic objectives within each of the aforementioned commissions (see below). Prioritized indicators were also proposed for each of the strategic objectives. Strategic plans have since served as platforms for operational planning.

- The attractiveness of this process led to a parallel structuring of Nicaraguan operational networks into working groups and to well-focused, cooperative participation in strategic planning exercises.

Strategic vision of the REMBLAH network in forest management: *Conserve, in a permanent fashion, the quality and quantity of the goods and services produced by broadleaf forests. Manage the latter to benefit society as a whole.*

The two strategic objectives *of REMBLAH in forest management:*

1. *Promote a policy aimed at increasing financial resources and incentives to encourage the SFM of broadleaf tropical forests in Honduras*
2. *Achieve greater participation of community groups in SFM of broadleaf tropical forests in Honduras*

To achieve the strategic objectives in community development, forest management, and industry and commerce, training and technical assistance were recognized as vital crosscutting activities. During shared operational planning exercises, network members were able to define each year a host of cooperative training and technical assistance activities, including cost-sharing and other schemes discussed below. By setting up cooperative capacity-building activities, member organizations gradually used more common conceptual and methodological criteria with regards to SFM approaches. Community groups participated directly in operational planning exercises, in order to ensure that training and technical assistance activities responded to their direct interests and needs.

THE IMPORTANCE OF CAPACITY-BUILDING AT DIFFERENT LEVELS

The word 'manager' used in the title of this paper should be understood in a broad sense. 'Managers', at different levels, greatly influence what happens in forests and protected areas in Central America. Certainly, capacity-building initiatives should never be limited to persons possessing professional degrees. And because of the multidimensionality and complexity of SFM in a multi-use landscape, capacity-building should target each of the following groups at different junctures:

- Representatives of community groups and others directly linked to forests (rural communities, indigenous groups, concessionaires, persons contracted by private companies, and forest workers)
- Field technicians and workers
- Project staff of NGOs and other organizations
- Private contractors
- Representatives from universities and technical schools
- Decision-makers

Collaboration in horizontal, cooperative networks facilitates the identification of the capacity-building needs of each of the above beneficiaries. Furthermore, a fairly uniform 'school of thought' can be fostered with regards to approaches to achieve SFM through cooperative capacity-building.

One successful effort to foster a 'school of thought' in SFM at the university level involved an exchange of professors between nine forestry faculties from five countries (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama). Initially, these exchanges were realized to encourage the sharing of research, outreach, and teaching experiences among forestry professors in the region, to collectively identify the desirable attributes of forestry graduates, to exchange information on curricular development, and to discuss the weaknesses and problems impairing the quality of academic programs. The interchanges then gradually devoted their efforts to the cooperative development of didactic university textbooks on topics related to SFM. To date four textbooks have been developed, all of which have enjoyed widespread use in Central and South America ('Silviculture of Humid, Tropical Forests with an Emphasis on Central America'; 'Diversified Forest Inventories of Broadleaf, Humid Tropical Forests with an Emphasis on Central America'; 'Reduced Impact Harvesting of Broadleaf Tropical Forests'; and 'Planning for the Diversified Management of Humid, Tropical Forests with an Emphasis on Central America'). The advantages of developing university textbooks such as these in a cooperative fashion are multiple:

- The texts incorporate quantitative and qualitative information from the region, drawing on the most promising research and operational experiences
- Disparities are lessened among faculty members from different institutions
- More knowledgeable and experienced faculty members have an opportunity to share their knowledge with less experienced colleagues
- High-quality, didactic university texts are invaluable for use in both university classes and the training of technical staff in research and development projects
- The sharing of knowledge and the widespread use of collectively developed, didactic texts favour the establishment of the aforementioned 'school of thought', in this case in SFM

THE IMPORTANCE OF DEVELOPING A CAPACITY-BUILDING STRATEGY

Capacity-building activities are costly and time-consuming. The formulation of a good capacity building strategy helps to ensure that those efforts undertaken are efficient, effective, and relevant. Surprisingly, a survey in 2000 of several organizations in Honduras and Nicaragua involved in forestry and agro-forestry development initiatives revealed that although nearly all recognized the impor-

tance of training programs to their success, approximately one half lacked annual training plans and nearly two thirds possessed no training materials to support workshops and courses. Recognizing the importance of a clear training strategy to the success of its initiatives, CATIE´s Natural Forest Management Unit (NFMU) formulated one by addressing, among others, the following questions:

- To whom are the capacity-building activities directed?
- What is the process of conceptualizing these activities?
- What topics should be covered?
- What are the approaches that will be employed?
- What types of capacity-building activities should be offered?
- When should these be carried out? Where?
- Who will serve as instructors for courses, workshops, and technical assistance activities?
- Who will pay for the capacity-building program?
- How can adequate follow-up be organized?
- How can a multiplier effect (of capacity-building initiatives) be achieved?

Briefly, examples of answers to these questions are provided, extracted from CATIE´s NFMU capacity-building strategy. This strategy was primarily implemented by the TRANSFORMA[2] project (CATIE/SDC), from 1997 to 2003 in Honduras and Nicaragua.

To whom are the capacity-building activities directed?
The target groups of the aforementioned strategy were defined as all actors involved in the SFM of broadleaf tropical forests. In each country strategic partners were identified, including community groups, development projects, public sector institutions, and private companies. Representatives from a considerable number of these entities became partners, and beneficiaries, of the capacity-building program. Special efforts were also made to direct training activities to decision-makers and women. Finally researchers, instructors, and students (from CATIE and its strategic partners) were also beneficiaries of the program in that experience in the field generates many opportunities for feedback and learning. During a six-year period, nearly 10,000 person days of training were directed to these target groups on diverse topics.

What is the process of conceptualizing these activities?
As has been shown, capacity-building needs are quite broad. In contrast, time and available human and financial resources are limited. Consequently, capacity-building activities must be defined with care. Since CATIE collaborated with a wide range of strategic partners, efforts were made to identify capacity-building activities that best responded to clear priorities. Indeed, the definition of topics was made with the direct participation of the target groups taking part in the capacity-building program.

Training priorities varied within any given year and among regions. For example, while experienced community groups in the Petén required capacity-building to comply with annual audits of forest certification and improve wood processing and commercialization, indigenous groups in the RAAN (Nicaragua) requested training on the significance of general management plans and on the political-legal framework of forest management. Gradually capacity-building needs evolve, reflecting an ever greater local capacity over time. Activities should clearly contribute to the achievement of desired improvements in SFM, and enhance the benefits of this responsible land-use practice.

Finally when working in collaboration with other organizations, an important challenge is to ensure that cooperative capacity-building activities are incorporated in the annual operating plans of each partner, detailing the persons responsible for each activity and the funds allotted to help cover costs.

What topics should be covered?
In a comprehensive capacity-building program, the topics covered will be quite diverse. As has been pointed out, SFM is a complex endeavour involving a wide range of skills and knowledge. The specific topics to be addressed will depend on the region, previous experiences, and existing priorities. One challenge is to develop a program in which activities can be carried out in a logical sequence, as SFM involves a number of activities that are sequential.

What are the approaches that will be employed?
It has often been observed that the most effective approach for capacity-building is 'learning by doing'. Efforts have been made to associate capacity-building activities with the specific operational activities carried out by various target groups. In this way, participants learn by applying the knowledge they acquired in capacity-building activities.

What types of capacity-building activities should be offered?
Within a capacity-building program many options exist, for example courses and workshops, technical presentations, in-service training, field days, seminars, forums, congresses, and direct technical assistance in the field. In addition to these types of activities, for many years CATIE has also offered strategic courses on protected area management and diversified forest management. Hundreds of professionals from over 25 countries have participated in these strategic courses, which have helped establish the aforementioned 'schools of thought' on the diversified management of lowland humid tropical forests and protected areas in tropical America.

[2] The TRANSFORMA Project supported technology transfer and the promotion of human capacity development in natural forest management. The project was financed by the Swiss Agency for Development and Cooperation (SDC).

When should these be carried out?
Time is one of the crucial limiting factors for any capacity-building program. When possible, training is best carried out to coincide with operational activities in the field. For example, reduced impact harvesting is best taught when harvesting activities are underway. Climatic considerations are also often important, as are those related to other productive activities (such as agriculture) carried out by community members.

Where?
When possible, capacity-building activities should be realized in a 'real world' context where land use practices of interest can be observed. Consequently, many activities should take place in the field: in forests, and in farmers' fields. Other types of training activities are appropriately carried out in the classroom, for example, technical writing, teaching methods, data processing, administration, and accounting. Nonetheless in each of these latter courses ample opportunity should also be created to 'learn by doing'.

Who will serve as instructors for courses, workshops, and technical assistance activities?
An organization such as CATIE often has a good number of capable professionals to support capacity-building activities. CATIE has devoted years to these types of activities (as have other highly capable organizations), giving rise to a growing body of persons who can make important contributions to capacity-building programs. Consequently, one element of the strategy is to take advantage of local capacity as a means to meet capacity-building needs in a greater number of regions at lower cost. Indeed, in some instances local capacity in specific topics is greater than that found in CATIE; in these cases it has been necessary to contract local instructors to meet local training needs.

CATIE has devoted considerable effort to the formation of local trainers from communities, especially in the operational skills required for reduced-impact harvesting. These highly skilled trainers have shown again and again the effectiveness of training using a 'producer to producer' approach, especially when local trainers have taken part in practical workshops on teaching and communication methods. The use of this approach has grown over time in the region.

Who will pay for the capacity-building program?
CATIE has benefited over the years from the generous donations of a wide array of international donors, who have financed both capacity-building activities and technical staff. These contributions have been crucial to maintaining a dynamic program in the region. Greater efforts have also been made over time to share capacity-building costs with strategic partners.

Participation in networks and shared planning exercises facilitates this trend towards an improved distribution of costs. Unfortunately however, in many cases even the organizations that recognize the importance of capacity-building activities fail to budget adequately for them. A clear demonstration of the tangible benefits of training and technical assistance is the best way to encourage greater investment in these activities. Finally, a growing number of donors and multilateral organizations are requiring that representatives from rural communities (however poor) and private companies pay for at least a portion of the services provided; when producers pay for these services, they have a greater voice in the topics covered and right to demand quality.

How can adequate follow-up be organized?
A great challenge for any capacity-building program is how best to evaluate its effectiveness and organize follow-up to activities. All capacity-building activities should of course be evaluated by the participants; participant evaluations provide invaluable feedback with which to gradually refine the activities. But beyond participant evaluations, organizations and donors also need to inform themselves about the effectiveness and impact of their capacity-building efforts. The lack of follow-up to capacity-building programs is a common deficiency, and one that was not completely resolved in the CATIE initiatives discussed in this paper. Nonetheless, various indicators of program effectiveness were monitored including the following:

- The degree of adoption of practices presented in courses and workshops
- Improvements in management plans
- Use of methodologies promoted by CATIE (permanent plots, application of criteria and indicators, sampling for silvicultural treatments)
- Use of CATIE training materials in courses given by other organizations and universities
- 'Willingness to pay' to take part in capacity-building activities
- Demand trends for capacity-building activities within and outside the region
- Testimonials provided by participants in capacity-building activities

Capacity-building is a process. This irrefutable truth should help guide all capacity-building programs, including the identification and selection of participants. Ideally, persons taking part in capacity-building activities should be those that consistently demonstrate an interest and commitment to put into practice and/or promote new knowledge. In this sense, capacity-building is a 'reward' for dynamic participation and commitment to improvement. Careful attention to the selection of participants always yields important benefits in improving program effectiveness. Furthermore since capacity-building is a process, continuity is crucial. Clearly, a critical mass of knowledge is not imparted in one or two courses. Experience has shown that long-term initiatives are the most effective in accomplishing clear capacity-building impacts.

How can a multiplier effect (of capacity-building initiatives) be achieved?
CATIE´s NFMU sought the development of local and regional capacity to plan and carry out programs and activities necessary for SFM. Evaluations in Central America and elsewhere have demonstrated that CATIE possesses invaluable technical expertise, and that this expertise has made an important contribution to SFM. Nonetheless the question remains: how can an organization such as CATIE reach an ever-increasing number of persons with its capacity-building program, taking into account the large disparity between available human and financial resources and the considerable demand for capacity-building activities? A key element in the answer relates to the development of *local* capacity to plan and implement capacity-building programs, and an important part of this local capacity is the formation of local trainers for courses and workshops. A few useful considerations for the formation of local trainers are as follows:

- Local trainers should participate in a systematic and coherent series of capacity-building activities to consolidate required knowledge
- They should generally specialize in specific areas and topics. Being a local trainer should not imply that one is capable of providing training and technical assistance in all topics
- They should be instructed to hone communication and teaching skills
- They should initially assist other instructors in a number of activities, before taking on the primary responsibility
- They should be dynamic persons with a keen interest in contributing to capacity-building

Once potential local trainers are identified, it is important that they have an opportunity to build their knowledge and skills over time. There should be a long-term institutional commitment to insure that these persons benefit from a series of opportunities and incentives over time. It is sad indeed when considerable time and resources have been expended to help form capable local trainers, only to fall prey to the latest budget cutback. Local trainers, once recognized as such, should also receive a formal certificate or diploma which can be used in the search for future employment opportunities. In many cases, highly trained and experienced local trainers have no document to certify their hard-earned status and capabilities.

HOW CAN A TRAINING CENTRE SUCH AS CATIE CONTRIBUTE TO CAPACITY-BUILDING?

A regional centre such as CATIE can make a number of important contributions to capacity-building programs, including the following:

- A regional centre is often aware of best practices being applied in different regions and countries. Oftentimes, CATIE has been able to facilitate a fruitful exchange of practices, knowledge, and methodologies across its region of coverage. On a broader scale CATIE has also cultivated a number of fruitful partnerships with centres from other parts of the world, thus augmenting the amount of available information to share in the Central American region.
- A regional centre often has the necessary continuity to build up an important body of knowledge over time. Ideally, this knowledge should be incorporated into training materials for use by a wide range of organizations. CATIE has also been able to play a central role in encouraging horizontal cooperation among diverse stakeholders at different scales. For example, CATIE has recently been selected to host the Regional Model Forest Network for Latin America and the Caribbean, an important initiative encouraging cooperation among stakeholders at the landscape level. As has been pointed out, horizontal cooperation is advantageous from many perspectives: knowledge-sharing, multi-stakeholder planning, efficient use of available resources, program continuity, etc.
- A dynamic capacity-building program requires a continuous influx of new knowledge from operational and research initiatives. Through its research, outreach, and education programs, CATIE generates a tremendous amount of knowledge and information on a continuous basis in technical, ecological, social, economic, institutional, and political terms. Each year between 50 and 60 masters' theses and a growing number of doctoral dissertations are submitted, as well as a large number of technical documents and articles directed to diverse audiences. This research is normally carried out in conjunction with research and development initiatives in many countries across the region.
- Finally, CATIE has a growing body of accomplished graduates who participate in the generation and dissemination of knowledge in their respective countries.

DOES SFM REALLY CONTRIBUTE TO THE INTEGRITY OF PAs?

In this section, experiences from Guatemala and Honduras are cited to illustrate how SFM can contribute to the integrity of PAs and to improving their linkages to the broader landscape. Most importantly, these experiences engage representatives from communities adjacent to PAs in activities aimed at fostering conservation and sustainable development.

In Guatemala, the community concession process in the multiple-use zone of the Maya Biosphere Reserve (MBR) in Petén arguably is the most important Central American example of community-based forest management that contributes to sustainable forest management and the integrity of the adjacent PA. When the MBR was created

in 1990, several communities were enclosed within the newly established reserve without legal access to wood and other resources. Community groups outside its boundaries were also prohibited from harvesting timber within the reserve. This policy decision, instead of reducing timber extraction in the protected area, led to a marked increased in the illegal logging and processing of timber with chainsaws within the reserve, as well as to a disorderly advance of the agricultural frontier (CONAP, 2002). Furthermore, restrictions prohibiting access to forest resources generated great friction between personnel of the National Protected Areas Council (CONAP) and representatives of local community groups (Carrera and Prins, 2002). Indeed, the situation became so tense that CONAP personnel were no longer able to enter the reserve due to security risks.

In the early 1990s, CATIE implemented a series of conservation-minded initiatives to promote the concept of sustainable development in Central America. A conceptual pillar of these initiatives was that conservation and production objectives can be compatible if adequate planning and operational controls are put into place. After much debate - sometimes heated - the decision was made in 1994 to grant the first community concession in the Multiple-Use Zone of the MBR to the community San Miguel La Palotada. This community had worked closely with CATIE's Project for the Sustainable Development of Central America (OLAFO), which received Norwegian, Swedish, and Danish financial support. They were granted a concession of 7,039 hectares for a period of 25 years (Carrera and Prins, 2002). Although this early concession demonstrated a number of inherent weaknesses as an incipient program (deficient technical backstopping and local technical capacity, excessive bureaucratic red tape, conflicts of interest, lack of experience in business management practices and the commercialization of forest products), it pointed the way for expansion. In the last decade, the expansion of this approach has placed primary responsibility for sustainable management of the forests in the MBR in the hands of community-based groups. The scope of the community concession approach is now quite ambitious, with nearly 500,000 hectares under certified management (FSC, 2004).

Although the community concession process is still in its beginnings, a number of tangible successes can be cited: reduction of forest fires during the dry season (Carrera and Prins, 2002), control of the expansion of the agricultural frontier within the MBR's Multiple-Use Zone (MUZ), and economic benefits to participating community-based groups (Mollineda, 2000; Carrera *et al.*, in press). Indeed, dramatic satellite images of the community concessions and adjacent national parks have shown that the incidence of fire is much greater in the national parks, where fire protection is supposed to be absolute (see CEMEC and CONAP, 2000; Carrera and Prins, 2002). Core protected zones in the MUZ embedded in a matrix of community and industrial concessions, on the other hand, have enjoyed almost complete protection.

On a more modest scale, community-based SFM has been promoted in the buffer zone of the Pico Bonito National Park in northern Honduras. Some of the more successful and dynamic community-based groups have successfully slowed the advance of the agricultural frontier into forested areas. Indeed, a recent undergraduate thesis in the community of Toncontin, analyzing the distribution of secondary forests, found that areas under secondary forests are increasing, at least temporarily. The community of Copen managed to reduce forest loss through proactive and participatory land-use planning within the community. These community-managed forests in northern Honduras play a crucial role in slowing forest loss and linking the Pico Bonito National Park to the larger landscape.

Although promising, these initiatives have also made clear that the process of consolidating SFM in a given region takes considerable time and capacity-building in a wide range of topics. A long-term commitment, and the ability to adapt to changing needs (regarding both information and skills), are needed to ensure success.

CONCLUSION

CATIE has cooperated in a number of important initiatives in Central and South America to promote capacity-building in SFM in all its dimensions. Because of the complexity and multidimensionality of SFM in multi-use landscapes, horizontal cooperation among diverse stakeholders is crucial. The establishment and consolidation of operational networks can be a useful approach to foster cooperation among diverse stakeholders.

The development of a capacity-building strategy is important to improve the effectiveness, efficiency, and relevance of capacity-building programs. A number of questions were presented above as examples to help orient the formulation of capacity-building strategies in other regions.

The importance (and difficulty) of monitoring and evaluating the effectiveness and impact of capacity-building programs has been highlighted. The challenge of how to attain a multiplier effect of desired impacts was also discussed. An important part of the solution clearly lies in the creation and consolidation of local capacity to plan and implement capacity-building programs, including the formation and certification of local trainers in a wide array of topics. Clearly, a long-term commitment is essential to the consolidation and success of SFM.

13

Mobile Seminars for Training Managers of World Heritage Sites and Other Protected Areas in Landscape-level Conservation Issues

James R. Barborak[1]

[1] Conservation International, Mexico/Central America

Mobile Seminars for Training Managers of World Heritage Sites and Other Protected Areas in Landscape-level Conservation Issues

INTRODUCTION

The global network of more than 100,000 protected areas now covers some 12% of the world's land area, and continues to expand. Global concern about advancing deforestation, biodiversity loss, deterioration of watersheds, degradation of coastal and marine resources, and the loss of flows of environmental goods and services provided by wild-lands has led conservationists and the general public to press decision-makers into concerted action regarding the conservation of remaining natural areas. While they are not a panacea for all environmental woes, protected areas are still considered to be the most effective tool in the *in situ* conservation 'kit'. Unfortunately, legal gazetting of parks and reserves is not enough to guarantee wise stewardship. In addition, the majority of protected areas that have been established are faced not only with internal problems but also with a series of threats that follow from inappropriate land use in surrounding landscapes and seascapes. World Heritage sites (WH sites) and many other strictly protected areas (PAs) are often surrounded by much more intensively used and degraded landscapes. Encroachment by expanding human populations, upstream watershed degradation, airborne contaminants, deleterious edge effects, visual blight, and fragmentation are all issues that affect the integrity of protected areas but that usually originate, or are more severe, outside their boundaries. Global change factors such as invasive species, massive demographic shifts within and between nations, climate change, and economic globalization add to the array of factors and threats that protected area managers now need to deal with. For these reasons the long-term integrity of natural WH sites and other PAs cannot be assured unless efforts are undertaken to stabilize and improve land stewardship on private and tribal lands and in extractive reserves, beyond the boundaries of strict reserves. Thus attention to landscape-level conservation issues, including buffer zone management and the establishment and management of ecological corridors, is of increasing interest to WH site and other PA managers.

Managers of WH sites and other PAs unfortunately often lack the skill sets and specific training or exposure to mitigate outside threats and to contribute to improved land stewardship beyond PA boundaries. Many are graduates of traditional agronomy, forestry, or biology programs at universities and technical schools that tend to be narrowly focused. Managers often lack the theoretical background or practical knowledge on how to apply an ecosystem approach to reserve management and to the conservation of protected area species and ecosystems, as recommended by the Convention on Biological Diversity. In a complex world of increased decentralization, privatization, and devolution of authority to local communities, tribes, and governments, protected area managers are also expected to contribute to poverty alleviation and to promote sustainable and equitable rural development. Thus success in PA management increasingly requires knowledge of participatory management, appraisal, social science, rural development, administration, and fundraising; these skills are all too often lacking among protected area professionals and are difficult to acquire in formal academic programs.

SPONSORING ORGANISATIONS

The University for Peace (UPeace) is an international institution, established by the United Nations in 1980 with the goal of working towards peace through education and studies in the fields of human rights, conflict resolution, education and communications for peace, and management of natural resources. Beginning in 1990, the University and The Wildlife Conservation Society (WCS) have collaborated on the development of a pilot, prototype international training event to deal with these issues: the Mobile International Workshop on Buffer Zone Management in Neotropical Protected Areas. The Workshop has been offered eight times as part of a program of intensive short courses in natural resource management organized annually by the Program on Natural Resources and Quality of Life of UPeace. Among UPeace professors are international experts in agro forestry, silviculture, protected area management, ecotourism, conflict resolution, and soil conservation. All of the instructors have considerable experience in short course and graduate-level teaching.

The event is financed by a variety of national and international organizations. UNESCO and the World Heritage Fund are among the principal donors, as many of the participants work in World Heritage sites and Biosphere Reserves. Other regular donors include WWF, WCS, the U.S. Peace Corps, GTZ, COSUDE, CARE, TNC, IUCN, USAID, and the U.S. Forest Service.

WORKSHOP OBJECTIVES

The six principal workshop objectives are as follows:

- Strengthen the knowledge of participants in basic planning and management principles and techniques related to PA management, particularly in buffer zones and corridors
- Provide first-hand exposure to management techniques and programs for PAs, buffer zones, and corridors at various sites and projects in different ecological zones in Costa Rica
- Analyze protected area, corridor, and buffer zones case studies to identify the strengths and weaknesses of different techniques and approaches

- Provide information for participants regarding sources of financial and technical support for the execution of conservation projects
- Review best practices, recent literature, and the 'state of the art' in neo-tropical PA, buffer zone, and corridor management
- Exchange experiences and information among participants from different countries regarding their own work and conservation projects

PARTICIPANTS

In the eight workshops to date, 191 technicians from 20 Latin American countries have participated, along with international cooperation specialists from four European and North American nations. Participants have included personnel from governmental organizations, non-governmental organizations, universities, community and tribal authorities, and development agencies. To be selected, participants must be directly involved in some aspect of protected area, corridor, or buffer zone management and have several years of experience. Participants must have the endorsement of their institution in order to receive a scholarship to participate in the workshop; most participants work directly in the field as protected area directors, technicians, or officials of NGOs or rural development projects. A small number of participants work at the regional or central level directing field projects, or are involved in conservation training and outreach. The course is for professionals with university-level education, or an equivalent combination of formal and experiential education; the latter allows carefully selected and highly experienced community and tribal leaders to participate.

WORKSHOP DETAILS

The event includes more than 20 intensive lectures on various aspects of the management of protected areas and buffer zones, given by specialists from the wide array of national and international conservation programs and institutions active in Costa Rica. While the course includes classroom instruction to ensure that all participants develop a common level of knowledge about key aspects of PA, buffer zone, and corridor management, the majority of the workshop is dedicated to visits to protected areas from diverse management categories, and to surrounding landscapes in different ecological zones and featuring different institutional arrangements and levels of financing, experience, and managerial success. The protected areas visited include two World Heritage sites, Guanacaste and La Amistad, two Biosphere Reserves (Central Cordillera and La Amistad), and several RAMSAR sites, including the Caño Negro, Gandoca-Manzanillo, and Palo Verde reserves. In these settings participants make trips to the field in small groups to examine different aspects of PA, buffer zone, and corridor management, and meet with residents of the zones and personnel from PAs and corridor and buffer zone sustainable development projects. Following site visits the observations, lessons learned, and problems encountered are discussed in small groups and subsequently in plenary sessions; conclusions and recommendations are shared with the staff of the projects visited, in the interest of two-way learning. Evaluations completed by participants address the relevance of the themes covered, teaching methods used, and interdisciplinary and international foci in the course. During the first few days of each workshop, participants also give presentations on their own work in PA, buffer zone, and corridor management in their home countries.

Duration and Timeline of the Workshop

The duration of the course and the time dedicated to different teaching modules have evolved based on the annual evaluations. In their evaluations participants have stated that three full weeks, with a free day in the middle, is the minimum necessary to cover the workshop themes and visit a variety of sites. Based on the recommendation of Workshop alumni, the course duration has been adjusted upward to a total of 19 days, beginning on a Monday and finishing on a Friday, which gives participants time to travel from and to their respective countries during weekends. Many participants and collaborating agencies have stated that it is difficult for well-qualified candidates to receive permission to participate for events lasting more than three weeks. Normally, the program begins with two days on the University for Peace campus that feature intensive technical lectures. This is followed by two weeks of trips to four different conservation areas, which last for an average of three days each, then two days at CATIE. The course ends in the capital city of San José with several days of wrap-up lectures and breakout groups that drive consensus on the general lessons learned regarding PA, corridor, and buffer zone management. These participant-derived 'lessons learned', and best practices observed, are then presented to the whole group for discussion.

Technical Lectures

Lectures given during this time and during final wrap-up sessions at the end of the Workshop include talks on principles of wildlife, fisheries, and PA management; silviculture; wetland, coastal zone, and watershed management; agro forestry systems; ecological certification of forest and agricultural products; natural resource conflict management; rural participatory evaluation; conservation biology; ecotourism in protected areas and buffer zones; reforestation with native and exotic species; gender issues; non-timber forest products; and financing and institutional options for protected area and buffer zone projects. There are also opportunities for talks with community leaders in the regions visited, where the former often serve as small group discussion leaders. Finally, since Costa Rica is a focal point for international conservation organizations and many have regional offices in the country, a roundtable discussion is held with representatives of as many of these groups as possible.

Mobile Seminars for Training Managers of World Heritage Sites and Other Protected Areas in Landscape-level Conservation Issues

Participant Presentations

Each participant is notified before arriving at the Workshop that he or she must be prepared to give an audiovisual presentation about the conservation programs in his or her country, with details about the work site. These presentations are given primarily during the first half of the workshop, so that participants have a chance to acquaint themselves with their colleagues' experiences early on. Although it requires a lot of time and many evening sessions, this aspect of the Workshop has always been positively evaluated by participants who emphasize the mutual learning that goes on.

Field Trips

The majority of the Workshop is dedicated to field trips throughout the country, during which a good number of protected areas and adjacent zones are visited. Four conservation areas are included - the ecosystems range from reefs and coastal wetlands to dry forests, humid tropical forests, and cloud forests. Costa Rica is ideally situated for this type of event because it has a decent road network and many of its protected areas have lodging, services, food, and academic facilities. Furthermore the country boasts a tremendous ecological diversity in a small area, and substantial experience in the management of protected areas and buffer zones. In addition, Costa Rica has two terrestrial World Heritage sites, two Biosphere Reserves and several RAMSAR Sites, and several trans-frontier reserve complexes with Nicaragua and Panama that speak to the management of internationally designated PAs.

So that participants may learn from these experiences and as a contribution to the management of the sites visited, on arrival at each site the personnel of the PA or development project visited give introductory talks about the history, achievements, and problems of their work, and provide real-world examples of the principles discussed in the classroom lectures. Participants are then divided into small groups of four to six members and conduct case studies at each site with the help of local resource-people. This provides the students with opportunities to interview local residents, technicians, business owners, and administrators and thereby to consider site-specific problems and alternatives. The results, which are later discussed in plenary sessions and included in the final Workshop compendium (provided to all participants), are also shared with the agencies and sites visited as a way of providing fresh, outside opinions on their work.

Lessons Learned

Each time the course has been given subsequent adjustments have been made, with the goal of improving the Workshop, regarding the sites visited, the lecturers invited, and the teaching techniques used. There are nevertheless some fixed limitations to an event of this type such as the high daily costs, the logistical difficulties of a 'mobile course', and problems specific to international capacity-building efforts including adequate funding and the recruitment and screening of good candidates.

The interdisciplinary, international, and mobile nature of the Workshop presents special challenges to the course organizers. The organization of a mobile event obviously makes certain aspects much more complicated, such as transport, lodging, meals, and the maintenance of a set schedule. Factors such as ensuring that international participants have the requisite visas, health insurance, etc. naturally add to the complexity. In spite of the proximity of sites visited and careful itinerary selection, travelling for hours by bus on often poor roads is tiring and the organization of small group trips at each site is logistically difficult. The invitation of instructors from many different institutions requires special care, in order to guarantee high-quality presentations and guided trips. Also, at times the best instructors simply have other obligations to meet and are not available, which then requires programming adjustments.

A mobile training event poses particular challenges. Although the physical plant of the University for Peace is excellent for classroom discussions before and after the series of field trips, and good buses are available in Costa Rica due to the booming tourism sector, during field trips portable computers and projection equipment are needed in order to prepare and present case studies. Sometimes suitable lecture and breakout rooms are hard to come by in remote PAs, and there are difficulties finding comfortable yet affordable lodging and places to eat. Mobile phones have become a very important tool to deal with emergencies, unplanned delays, and the reconfirmation of logistical arrangements.

Special care must be taken in the selection of rural communities in which to conduct field exercises, particularly in zones where there is any type of conflict. Also, it is necessary to ensure that the communities and projects visited receive the results of the group projects completed by Workshop participants, and do so in a timely fashion, as compensation for their generosity in sharing their time and experience.

SIMILAR EVENTS

The University for Peace Buffer Zone Workshop was designed taking into account the earlier experience of CATIE and the United States National Park Service (USNPS) in organizing international mobile seminars on protected area management. On four occasions in the 1970s and 1980s, CATIE organized an international mobile seminar on protected area management that visited three or four countries yearly over a several week period. The countries visited varied, but lay between Colombia and Mexico; that workshop was given in Spanish, but has not been repeated for some years. For many years, the USNPS organi-

zed a flagship international mobile seminar on protected area management in the USA and on some occasions with additional trips to Canada and Costa Rica. That seminar was primarily for high-level park service personnel, was global in its scope, and was given in English. While it is no longer given, the U.S. Forest Service and a collaborating consortium of universities from the western United States are now organizing a similar mobile seminar on PA management in English, in the USA, on an annual basis. However, neither of these events focused primarily on landscape-level conservation beyond the limits of traditional PAs.

The University for Peace Buffer Zone Workshop is not the only training event given for Latin American managers of World Heritage sites and other PAs in recent years that includes a combination of classroom instruction, field trips, participant presentations, and practical exercises on various aspects of PA management. Perhaps one of the most telling indications of the success and importance of the training approach used in the UPeace mobile workshop is the number of its spin-offs. A graduate of the UPeace workshop helped the Organization for Tropical Studies begin to organize international mobile courses on protected area management in Costa Rica, and these have been held on a number of occasions over the past decade. Over the past 15 years Colorado State University has organized an international short course on protected area management in Spanish for Latin American protected area managers, and several of the instructors had earlier been involved in the CATIE mobile seminars on PA management. UNESCO and the World Heritage Fund have sponsored a number of scholarships to this event, which includes a mix of classroom instruction and field visits. The Latin American Protected Area School (ELAP) of the University for International Cooperation in Costa Rica has likewise organized several short courses on buffer zone management in recent years, and plays an important role as the focal point for training for the Latin American network of Biosphere Reserves. Ducks Unlimited Mexico (DUMAC) has for many years organized, with the support of the U.S. Department of the Interior, a multi-week course for PA managers from throughout Latin America that shares some common elements with these other events.

CATIE, while it has not replicated its protected area mobile seminar in many years, has continued to organize its well-established short course on protected area management; this was held most recently in June 2005, for the 27th year. During the past two years the focus of this event, which has also received considerable support from UNESCO and the World Heritage Fund and is attended by many staff members from WH sites and other internationally designated PAs, has shifted its emphasis to buffer zones, corridors, and the ecosystem approach to biodiversity conservation. Of particular note is the fact that individuals involved in the development of all of these events have benefited from staff exchanges: the University for Peace Workshop has included visits to CATIE and lectures by CATIE staff; the organizer of the University for Peace staff has served as an instructor in the CATIE and Colorado State courses; and CATIE, OTS, UCI, UPeace, and other Costa Rican training centres have formed a consortium to further their joint activities and avoid duplication of effort.

Several graduates of the University for Peace Workshop have returned to their home nations and organized similar workshops in recent years, notably in Honduras and Venezuela. Several Honduran graduates organized a national spin-off seminar on one occasion. A Venezuelan graduate who works for a Venezuelan NGO, ACOANA, has now organized two short courses on PA management involving field trips and practical exercises within and around the Canaima National Park and World Heritage site.

CONCLUSIONS

The organization of international short courses and workshops involving participants from many, often distant nations is not easy or cheap. Logistical, financial, and even political issues such as visa requirements make organizing such events a major challenge. Many national institutions prefer, rightly, to invest their limited training budgets in internal events with much lower daily costs; they can thus train many staff members for the cost of sending just one representative abroad.

To maximize the impact, effectiveness, and efficiency of capacity-building programs for personnel of protected areas in Latin America, the biggest investment in training should not be at the international level. Rather the main focus of PA training should be *within* nations via local, regional, and national-level courses, and cost effective training mechanisms that do not require formal events: training 'tool kits' and libraries provided to PAs, personnel exchanges, strengthening of libraries in protected areas, and other mechanisms for distance learning. Events such as the UPeace Workshop and similar courses mentioned here and offered in Mexico, Costa Rica, and the USA should be seen as special supplements to in-country training programs for what may be termed the 'best and brightest' - high achievers who hold strategically important positions or are being groomed for leadership posts, who have already had national-level training, and who have demonstrated exemplary levels of responsibility, experience, and professional capacity, and/or who may become trainers of trainers.

There is no reason why practically-oriented, hands-on mobile seminars cannot enjoy much wider replication as a training tool for WH site and other PA managers, particularly at a national or sub-national level and wherever the institutional interest and funding, logistical possibilities, and diversity of PA and land management experiences permit. Even when not done on an international level, however, mobile seminars of this type require excellent

logistical coordination, a strong commitment on the part of one or more sponsoring institutions, and much 'sweat equity'. All the same, the evaluations of the UPeace Workshop suggest that the mobile seminar is an excellent mechanism for training personnel in those aspects of protected area management where it is important to be exposed to a broad range of comparative experiences, both by visiting a diversity of sites and by sharing experience with other participants. It is an alternative that deserves greater attention by the conservation agencies responsible for national PA systems. It is particularly important for contributing to the improved stewardship of internationally recognized PAs, such as WH sites, whose wise management requires strong commitments from national and international organizations. The long-term conservation of such globally significant sites requires cadres of well-trained technicians and critical thinkers, capable of applying a multidisciplinary approach and a wide range of land stewardship techniques to the land management issues and threats that usually range beyond PA borders.

ACKNOWLEDGEMENTS

The author would like to thank Mr. Felipe Matos, formerly of the University for Peace, Dr. Kristen Conway of WCS, and Mr. Steven Ripley of UNESCO for assistance in editing this paper, and UNESCO and the World Heritage Fund, the European Union, and the many other donors to the UPeace Buffer Zone Workshop for their support.

14

Kaziranga National Park and World Heritage Site, India: Taking the Long View

Vinod Mathur[1], Ashok Verma[1], Nigel Dudley[2], Sue Stolton[2], Marc Hockings[3], and Robyn James[3]
(UNF-UNESCO 'Enhancing Our Heritage' Project Team)

[1] Wildlife Institute of India, Dehradun.
[2] Equilibrium Consultants, UK.
[3] University of Queensland, Australia.

ASSAM: A RIVER STATE AND A DEVELOPING STATE

The valley of the Brahmaputra River covers some 60 percent of the state of Assam in northeastern India (Choudhury, 2004). This immense river, which flows 2,900 km from its source in the eastern Himalayas to the Bay of Bengal, is fed by the southwest summer monsoon when over 80 percent of India's total annual precipitation occurs (Asian International Rivers Centre, n.d.). Not surprisingly the Brahmaputra River has one of the highest flood potentials in the subcontinent (Kale, 2003), with on average five to 19 floods per season (Dhar and Nandargi, 1998). Floods can develop into social and economic disasters causing loss of life, livelihood, and infrastructure; but flooding is also part of the natural process of the Brahmaputra in creating one of the most fertile stretches of land in India. Assam has a primarily agricultural economy, with 74 percent of its population engaged in agricultural and allied activities. Monsoon-based rice production is the principal crop, covering 67 percent of the total cropped area (Coopers & Lybrand, 1996). Nearly 500,000 ha of the agricultural land are irrigated, over 50 percent of this from surface flow (Government of Assam, 2003). Assam contributes up to 55 per cent of India's tea output and 15.6 percent of world tea production (Bhattacharyya, n.d.).

Assam's GDP growth *per capita* is the lowest in India, due in part to high population growth but mostly as a result of immigration, the costs related to perennial flooding, slow agricultural development, high transportation costs, poor industrial growth, and a lack of infrastructure (Pathak, n.d.). Economic problems have been exacerbated by long-term insurgency and unrest. The Government of India is committed to '… accelerating the pace of socio-economic development' in the northeast region (Government of India, 2002) and the potential for developing natural resources in Assam has been highlighted (Coopers & Lybrand, 1996). As well as important mineral and forest resources and tourism potential, development opportunities have also focused on the water system of the Brahmaputra which has potential for energy, irrigation, and transportation development.

KAZIRANGA: ONE HUNDRED YEARS OF CONSERVATION SUCESS

The grasslands, floodplains and flood plain lakes (known locally as *beels*) of Assam provide an ideal habitat for a wide variety of species. Today many of these are endangered, and have had their habitat limited to small areas within the state, most notably Kaziranga National Park. Preliminary notification of the area as a forest reserve was given in 1905, and in 1985 the 430 km^2 Park was designated as a natural World Heritage site due to its outstanding biodiversity. Over the last 100 years Kaziranga National Park has become the habitat of several endangered species: the Park is home to about 60 percent of the world population of Indian one-horned rhinoceros (*Rhinoceros uncornis*), about 50 percent of the endangered Asiatic wild water buffalo (*Bubalus arnee*), and features the only viable eastern swamp deer (*Cervus duvaucelii*) population in the northeastern region, of about 400 animals. Its major conservation success has been the increase in numbers of rhinoceros: a few were recorded when the Park was first established, with the population counts recovering to 366 in the first survey in 1966 and 1,552 in 1999; today numbers are still on the increase (Mohapatra and Singh, 2003).

FUTURE CHALLENGES: AN 'ISLAND' IN A SEA OF DEVELOPMENT

Kaziranga National Park is now a protected area of global significance. While some issues remain to be addressed within the protected area, particularly with respect to constant poaching, the main challenges in the future will come from outside, and particularly from regional pressures at a landscape scale: Assam Government development priorities, and more diffuse pressures caused by a growing population and higher economic expectations. Kaziranga is thus facing a situation similar to that experienced in many other parts of the world, where success in management within the boundaries of the protected area itself is threatened by changes in the wider landscape. Future success will depend on the Government of Assam's commitment to adopting a landscape approach to conservation throughout the state, and to ensuring that changes that take place outside the park do not create pressures so great that it can no longer function effectively.

Some key landscape-scale issues addressed in this paper include:

- Changes to the hydrology of the Brahmaputra system.
- Infrastructure development, especially the widening of the current highway and its impact on animal migration in the event of flooding and increased mineral exploration.
- Impacts of climate change.
- General land use change, due to population pressure and agricultural development.
- Hydrological Change in the Brahmaputra system. Flood control is a major issue for the Government of India, and across the country infrastructure has been developed to protect towns and villages from flooding (Mohapatra and Singh, 2003).

A comparison of the three recent extreme floods (1987, 1988, and 1998) affecting Bangladesh (from waters of the Ganges, Brahmaputra, and Meghna basins) found intense monsoon precipitation was the principal cause of flooding (Mirza, 2003). Other causes are still being explored, although research data are somewhat lacking (Mirza *et al.*, 2001). In particular, there are differences of opinion concerning the significance of land use change and espe-

cially the role of deforestation in upstream areas, with some commentators believing this leads to accelerated soil erosion and landslides during monsoon precipitation, thus contributing to the floods downstream; others disagree with this interpretation (Mirza *et al.*, 2001; Mirza, Warrick, and Ericksen, 2003). Whatever the case may be, it is estimated that over 73 percent of the Brahmaputra watershed's original forest has been lost (Asian International Rivers Centre. n.d.).

The Brahmaputra is also one of the most sediment-charged rivers of the world (Biswas and Boruah, 2002) and the Brahmaputra region in India is highly prone to earthquakes; this causes landslides, which disturb the drainage system (Boruah and Biswas, 2002). Bank erosion for instance has become a serious problem following the 1950 Assam earthquake, which changed the course of the river and contributed to heavy flooding in the following years. Deforestation and flood control methods, such as the construction of embankments, have also altered the riverine ecosystem. This has resulted in the river becoming heavily silted; in Upper Assam the river bed has been raised to such an extent that only a few days of rain can result in major floods (Bandyopadhyay *et al.*, 2002).

A Likely Increase in Dams

India has over 4,000 big dams - only China and the USA have more (Ministry of Water Resources, 2002). Dams have been instrumental in increasing irrigated land, from 19.5 million ha in 1947 to 95 million ha by 2000 (Bandyopadhyay *et al.*, 2002); this change in land management is also partly responsible for the increase in food production, from 51 million tonnes in 1950-51 to 208 million tonnes in 1999-2000. Dams also provide power, contributing a total of 22,007 MW of hydropower generating capacity by the end of the 1990s. However, these 'temples of modern India', as dams were once described, also bring with them involuntary displacement, and inadequate resettlement and rehabilitation, of local populations (Bandyopadhyay *et al.*, 2002).

There are currently no large dams on the Brahmaputra. Given the river's international significance however, any plans to harness its power generate great interest. In 2003, for instance, the Indian press was quick to follow up reports on possible dam developments on the Chinese section of the Brahmaputra with the Chinese Foreign Ministry. China replied that there were no plans to build a 'power plant' on the river (The Hindu, 2003). The Board's 1997 government-approved Master Plan for the Brahmaputra proposes 34 'drainage development schemes' that include hydropower dams, embankment reinforcement, and other multipurpose projects (Government of Assam, n.d.).

Nationally there are also plans for a US$100 billion project to integrate most of India's major waterways, which could also have major impacts on the state and its river. The project aims to transfer 'surplus water' from the Himalayan and other rivers to regions where water is scarce. It has been estimated that 173 billion cubic metres of water (equivalent to a quarter of the Brahmaputra's flow) could provide drinking water, irrigation of 35 million hectares, and the generation up to 34 GW of electricity. Nationally, the project would also involve the construction of 12 reservoirs, displacing an estimated 450,000 people and flooding 80,000 ha of forest (Jayaraman, 2003).

Infrastructure Development

The 54 km of National Highway (NH) 37 that run parallel to the southern boundary of Kaziranga National Park, between Bokakhat and the Ghorakati range, divide the landscape between the low-lying grasslands in the north and the elevated Karbi Anglong hills in the south. During the rainy season, when flooding in Kaziranga forces wild animals to move southwards to higher ground, many are killed by vehicles while attempting to cross the highway (Bonal and Chowdhury, 2004). Hog deer, fishing cat, civet, swamp deer, and the hog badger suffer the highest mortality rates. The Park's managers have identified crucial animal crossing corridors on the road and have implemented several measures to reduce animal mortality including road signage, terrain easements, rumble strips, road awareness campaigns, intensive night patrolling, and regulation of vehicular traffic (Bonal and Chowdhury, 2004). However the Government of Assam, in its vision for Assam in 2025, highlights the need to develop urban roads, State Highways and National Highways to facilitate tourism, trade, and commerce (Government of Assam, n.d.); plans are thus underway to convert the existing NH-37 to a six-lane expressway (Bonal and Chowdhury, 2004). If it comes to pass, this linear development may cause a permanent barrier effect (Rajvanshi *et al.*, 2001) and also increase wild animal mortality. There is an urgent need to conduct a comprehensive Environmental Impact Assessment study, and to develop appropriate mitigation options. Options may include re-aligning the expressway through Nagaon-Silghat-Tezpur-Lakhimpur-Jorhat, to protect the ecological integrity of this World Heritage site.

Mineral-Based Industries

The Government of India opened up the oil and gas sector to private investments, with the aim of enhancing crude oil production to meet the rising consumption of petroleum products (Coopers & Lybrand, 1996). A Coopers & Lybrand guide for investors notes that Assam has rich deposits of many minerals *(id.)* Assam already accounts for nearly 50 percent of India's on-shore crude oil production, and has the highest success ratio (70 percent) in the world with respect to oil exploration (Coopers & Lybrand, 1996). The report notes that the state has over 1.3 billion tonnes of proven crude oil and 156 billion cubic metres of natural gas reserves. Approximately 58 percent of these reserves are yet to be explored, but offer '… tremendous scope for exploration'. Given these facts it is not surprising

that the report concludes that '… more areas in Assam are expected to be opened up' for hydrocarbon extraction. The areas recommended as having the best potential are the north bank of the Brahmaputra, the Brahmaputra river bed, and marshy areas on the Brahmaputra banks (Coopers & Lybrand, 1996). One oil refinery in Numaligarh has already been identified as a possible threat, positioned as it is upstream from the Park on the Dhansiri river (Choudhury, 2004).

Climate Change

Researchers have concluded that the strength of the Asian monsoon has often varied in response to changing global processes over the last few million years (Kale, Gupta, and Singhvi, 2004). There is therefore every possibility that current and predicted changes in climate and precipitation will also have impacts on the Brahmaputra River. Given the extent to which the ecology of Kaziranga is dependent on the variations in annual river flow, climate-induced changes could have a major effect on the Park's ability to maintain biodiversity over time. Firm evidence of a long-term regional trend in area-averaged precipitation for Asia has yet to be found (Mirza *et al.*, 2001) however various models have been developed to predict the possible effects of climate change in the region. Although the results differ in extent, all agree that an increase in water levels (and thus possibly also of flooding) is likely. One atmosphere-ocean-land model suggests that the Ganga-Brahmaputra discharge could increase by as much as 49 percent, due to an increase in the absolute humidity of air and the intensification of the South Asian monsoon circulation (Manabe, Milly, and Wetherald, 2004). A climate change scenario using UKTR results (a high resolution transient climate change experiment carried out by the Hadley Centre in the UK) show the peak discharge of the Brahmaputra increasing by 13 percent following a 6^{0}C global mean temperature rise (Mirza, Warrick, and Ericksen, 2003).

Land Use Change

There are 23 villages bordering Kaziranga and at least four tea gardens, with another 30 villages close by; the total population in the immediate area of the park is about 70,000 (Choudhury, 2004). The Karbi Plateau to the south of the Park is an important area of high ground. Large-scale habitat changes in the plateau include conversion to tea gardens, settlement, logging, and *jhum* (shifting agriculture). These developments have mainly occurred in the last 50 years. This has serious implications for the ability of Kaziranga Park, and for Assam as a whole, to maintain healthy populations of animal species. For example, the 2000 census recorded 86 tigers in the Kaziranga National Park (Vasu, 2003), which is a growing and healthy population; but the long-term survival of the species in the region is also dependent on maintaining links to other healthy populations, through biological corridors and the careful use of buffer zones. Currently these are not addressed in the management plan (Vasu, 2003). A recent global study identified the Kaziranga-Meghalaya region as one of the priority tiger conservation habitats in the Indian subcontinent (Wikramanayake *et al.*, 1998). As land use changes increase around the Park there are risks that the resident population of tigers and other animal species become genetically isolated, and in time no longer viable.

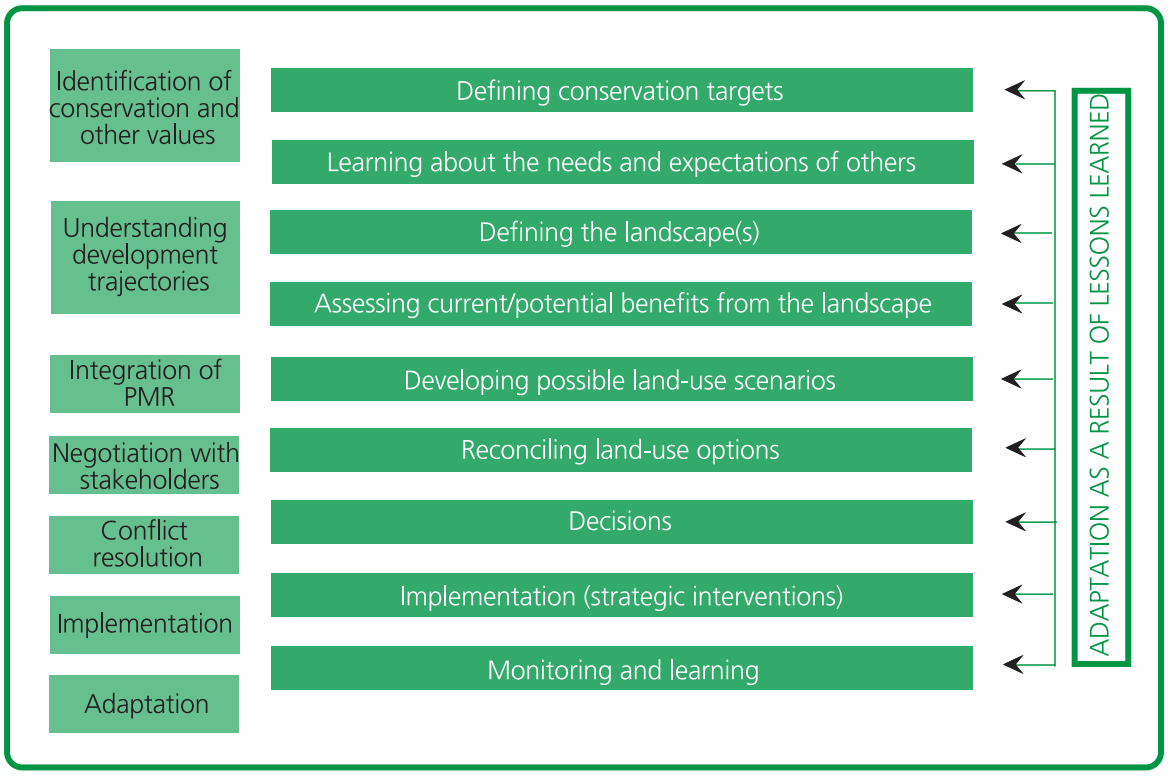
The tea gardens that have developed close to the Park boundaries pose a threat because of pesticide and fertiliser run-off, and the increased potential for invasive exotic species such as mimosa, wild rose, water hyacinth, and lantana to colonise the Park. The threat of invasive species has so far been controlled through the efforts of Park staff and the regular flushing of the Park from flood waters. However pesticide and fertiliser run-off is harder for Park staff to control. The use of fertilisers and pesticides is increasing: fertiliser consumption rose from 14.2 kg per ha in 1996-97 to 46.50 kg during 2002-2003 (NEOLAND Technologies, 2003) and it is reported that pesticides are being used '… randomly, without assessment of the pesticide formulation and quantity' by farmers near urban areas who are converting to vegetable crops (which are prone to pest attack) (World Bank, 2005).

PLANNING FOR THE FUTURE: THE NEED FOR A LANDSCAPE APPROACH

It is clear that the continued survival of species within Kaziranga over the next century will depend to a large extent on what happens beyond the Park's boundaries and will rely on ensuring that management options elsewhere - in the river and in the surrounding landscape - do not undermine the ecology of the protected area. Developing a mutually acceptable management mosaic will be difficult, and implies hard negotiation and some trade-offs. The application of a landscape approach for Kaziranga will require evaluation of current and future pressures (including strategic impact assessment), development of different options (scenarios), agreement on the optimal way forward and a series of strategic interventions, and careful monitoring so that adaptive management can be applied as necessary. The Government of Assam has indicated a willingness to work with Park authorities to explore future options. Initially, work is needed to assess the values in the wider landscape, look at the impacts of development pressures, and flesh out some alternative scenarios for discussion and negotiation. Steps would be required as outlined in the box below (Aldrich *et al.*, 2004):

The immediate steps for Kaziranga's strategic environmental assessment would be:

- To identify the scale of the study (the landscape).
- To identify and contact key stakeholder groups.
- To assess current and potential benefits from the landscape (biological, energy, etc.) making use of existing studies and, where necessary, initiating new studies.



- To look at likely pressures on Kaziranga National Park.
- To suggesting ways of avoiding or mitigating these pressures.
- To developing a series of scenarios for sustainable development, in the catchment and beyond, that would allow maintenance of Kaziranga's values and of Assam's wider biodiversity.

Options for Damage Control

A number of options can be identified for reducing impacts of identified pressures:

Reducing erosion:
Strategies may be needed to stabilise river banks and thus decrease the likelihood of erosion. For example, a model experiment on the island of Majuli, on the Brahmaputra in Upper Assam, developed soil conservation techniques utilising native herbs known for their soil binding capacity. Soil erosion in the experimental site was reduced to only about 2 percent compared with about 15-20 percent in the previous years (Biswas, Baruah, and Hazarika, 2000).

Underpasses/Overpasses to address road casualties:
There is limited experience on the use of underpasses/overpasses for wildlife that can funnel animals escaping floods away from traffic. Further research is required, as it is not known if the range of wild animals including elephants and rhinoceros would use this infrastructure.

High ground refuges:
The forest department has already built a number of earthen platforms inside the park, where animals can retreat from floods. Their effectiveness needs to be evaluated.

Integrated catchment management strategies:
A number of methodologies exist for calculating the impacts of dams and then planning to minimise side effects, although a thorough study of likely effects of different hydropower schemes and locations is urgently required.

Extension of the Park's area:
The Park has extended its boundaries, and contiguous areas have been protected in recent years. Several other additions have been proposed (Vasu, 2003) but they all need to be gazetted first and then placed under an effective management regime.

Pollution reduction strategies:
To reduce pesticide run-off into the river, several strategies would be needed including conversion to organic production. In 2002, 71 tea gardens were producing organically in Assam and another three were in conversion (ENVIS, 2002)

CONCLUSIONS

The last one hundred years have seen some major conservation successes in Kaziranga, with populations of many threatened species rising dramatically. These successes, and the expectation that they will continue, also bring management challenges. For Kaziranga to achieve another one hundred years of successful conservation there will need to be considerable effort to balance both the needs of increasing wildlife populations and a range of development projects.

15

Protecting Tropical Forests of Global Importance: The Central African Landscape Approach

by Terese Hart[1] and Guy Debonnet[2]

[1] Wildlife Conservation Society
[2] UNESCO-World Heritage Centre

When national backing is inconsistent, the integrity of world-class protected areas depends on their acceptance locally as community or provincial institutions. To be effective, this must include a local willingness and capacity to control pressures from the surrounding landscape. Support from the national government remains essential but in Central Africa, the second largest tropical forest area in the world after the Amazon, it must not be the sole means of conservation. National collaboration has been conditioned by a very recent history of armed conflict in both the Democratic Republic of Congo and Congo-Brazzaville, which together make up over 65 percent of Africa's equatorial forest. In Gabon, a more stable country occupying over 17 percent of the forest area, the administrative structure for national parks is new and its management capacity is thus unproven.

Without national structures in the Congo Basin to ensure the long-term viability of its forested World Heritage sites, it is essential to strengthen these protected areas on the ground by creating clear, locally recognized positions for them in their landscapes. This may be achieved through legal agreements at the local administrative level, to be confirmed eventually at higher levels of government; it can also be done through management plans and investment that focus on controlling outside influences, and by forging local alliances with diverse stakeholders.

Development and conservation initiatives in a single landscape will be more successful if they collaborate, identify common goals, and work towards securing them on a geographically complementary scale. Although the concept that the 'area of action' includes a much larger purview than indicated by the original target is neither new to conservation nor limited to Central Africa, it nevertheless has particular relevance for the Congo Basin's forests.

A brief overview is provided below of the landscape model as adopted by multilateral development organizations, bilateral aid organizations, and international conservation NGOs. Development organizations often present desirable results as interconnected activities programmed over broad geographic areas. In his 1999 'Proposal for a Comprehensive Development Framework' (Wolfensohn, 1999), the then president of The World Bank stated that success is dependent on many conditions extraneous to any single project target. 'Building new schools is of no use without roads to get the children to the schools and without trained teachers, books, and equipment. Establishing banks ... without a banking system that is supervised will lead to chaos…' and so on. The link to the environment is clear: '… the continuing degradation of important natural resources, like forestry, aquifers, and so on, represents a silent crisis that will be difficult to reverse.' Based on this premise The World Bank has supported national efforts in the Central African region to develop forestry codes that call for complete zoning of the forest domain into classified, community, and production forests. Development would take place on the basis of 'forestry units', with management plans approved at the ministerial level and including the provision of diverse goods and services from the forest domain (*i.e.* tourism, hunting, logging, etc).

More explicitly the United States Agency for International Development (USAID), through its Central African Regional Program for the Environment (CARPE), brings support to entire landscapes defined as important within the framework of a Congo Basin Forest Partnership (CBFP). 'These priority landscapes do not mean protected areas - rather, they represent zones within which conservation should play a prominent role, through various land use activities in protected areas and corridors, and through sustainable forestry management and community-based natural resource management' (USAID, 2005). The Partnership is a grouping of European, American, and African government partners (and some private members). Although the CBFP was led during its first two years by the USA via CARPE, it is currently chaired by France. African States themselves also recognize the importance of a landscape approach. In the strategic 'Convergence Plan' put forward by the Conference of Ministers in charge of Forests in Central Africa (COMIFAC), the latter endorsed the concept that landscape-scale implementation offers the greatest chance of conservation success.

International NGOs often collaborate with development agencies in implementing direct conservation measures; these NGOs are also adopting both a broader geographical perspective and more narrowly targeted goals. The Nature Conservancy (TNC) for instance, which as yet does not have an African base, designs whole 'eco-region' portfolios based on a process that includes a network of conservation areas and the identification of '… the highest priority conservation areas, wide-ranging targets, and pervasive threats to conservation action'.

The Wildlife Conservation Society (WCS), an international conservation group with an African base, holds the view that '… the larger landscape adjacent to protected areas, with both humans and animals living within it … is often as important as the protected core'. Through its 'Living Landscapes' program the Society promotes an approach that involves not only protected areas, but also neighbouring people and governments, and the private sector. Similarly the World Wide Fund for Nature (WWF) uses the tools of 'wild places' and 'eco- regions'; it defines the latter as a '… large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions'. Likewise Conservation International (CI) orients its conservation projects to 'biodiversity hotspots' that it promotes as environmental 'emergency rooms'; these may cover several nations, as in CI's nominated 'eastern Afro-alpine zone' that includes a large part of Ethiopia, the whole Albertine Rift, and various points in Kenya and Tanzania.

With this growing international recognition of the need to pull a greater area into focus in order to achieve enduring

conservation results, UNESCO is conferring with diverse partners in order to leverage conservation at a landscape scale for entire forest areas of World Heritage importance. This effort follows from conservation challenges that, in many forest protected areas, relate in large part to the impact on the site from *external* effects or landscape pressures. Two case studies presented here will illustrate the need for a landscape-level orientation to protect World Heritage forests. The first is a landscape including the Ituri Forest in north-eastern Democratic Republic of Congo (DRC) with its World Heritage-protected core, the Okapi Reserve. The second is a group of protected areas in the western Congo Basin, joining several countries through connecting forests that cross national boundaries.

THE ITURI FOREST AND THE OKAPI RESERVE: LANDSCAPE CHALLENGES FOR A WORLD HERITAGE SITE

The Okapi Reserve was inscribed on the World Heritage List in 1996, on the basis of its importance for biodiversity conservation. Less than a year later it became a World Heritage Site in Danger, as the Democratic Republic of Congo descended into civil war. It remains in some danger still, but its relatively successful protection during a prolonged war came from the recognition that all the major threats (poaching, mining, expanding agriculture, and bush-meat trade) must be tackled at a landscape level. There was commitment, from the national management authority (ICCN), international NGOs already working for conservation on the ground (WCS and Gilman International Conservation), and international organizations such as UNESCO and the United States Fish and Wildlife Service, to preserve its integrity during the war and to address the challenges existing inside and outside the Reserve.

In 1992 the government of then Zaïre created the Okapi Reserve, encompassing 13,700 km^2 of the Ituri Forest (see Figure 1). This was only four years before the Reserve became a World Heritage site. An important part of the country's biodiversity resides in this forest: it is home not only to the rainforest giraffe and the okapi, but also to 13 species of diurnal primates (more than are known from any other single African forest), and an unusually high number (six) of duiker species that co-exist with three other antelope species and the water *chevrotain*. There are three crocodile species, two large cat species, and a very important population of forest elephants that until 1992 had been little disturbed by poachers. The forest's flora is distinguished by an unusual juxtaposition of several distinct old forest types, dominated by different caesalpiniaceous species and from which protrude boulder-capped inselbergs with a unique fauna and flora.

When the Reserve became a World Heritage site based on its natural assets, another potential criterion for its inscription was pointed out: the World Heritage Committee suggested the possibility of recognizing the Okapi Reserve as a *cultural* landscape, as the Reserve is home to important Mbuti populations and sustains their hunting-based economy. The World Heritage Committee also recommended zoning the Reserve with a core of complete protection amounting to roughly 36 percent, and with most of the rest being maintained for traditional Mbuti hunting. The zoning would also allow for small agricultural pockets, and would extend the area of protection beyond the current Reserve borders to include a 50-kilometre peripheral zone. The proposed extension zone delimited a traditional concept of landscape; however, the landscape area critical to conservation, and thus to zoning, actually extends for more than 500 kilometres. The challenge has been to extend zoning in wartime, and to both protect traditional Mbuti hunting and address the landscape scale impact on the Reserve. If zoning could be initiated how could it be made effective, and if so over how great an area in an administratively weak context?

It was not war that caused threats on a landscape scale; war only changed their gravity and the ability to address them. Well before armed conflict, a high population density (over 200 people per km^2) to the east in the Albertine Rift drove peasants into the lowlands. Grass-roots commercial development saw entrepreneurs moving into the hinterland, seeking to open up small shops amidst population clusters and around camps of mine labourers (digging for gold, coltan, diamonds, cassiterite, etc.). These forces had already put pressure on the forest by the early 1990s, and drawn some Mbuti groups into a new commercial exploitation of the Ituri Forest.

With the war however, all national efforts to control the flow of immigrant populations into the Ituri Forest ceased; attempts to control the illegal exploitation of forest resources also came to an end. Elephant-killing and ivory poaching by military personnel increased dramatically during the war, and has continued in the post-war anarchy. Armed forces from the full range of protagonists have been involved: the Ugandan military, forces in the western *Equateur* province, in the eastern Kivu provinces, and the police force of the population centres adjacent to the Reserve. All have poached elephants and trafficked in ivory, and many also had some commercial involvement in the illegal mining camps in the Reserve. In 2004, direct evidence showed that a minimum of 164 elephants were poached in the Reserve. Of the ivory shipped through towns in northeast DRC, 80 percent comes from the Okapi Reserve. During just six months in 2004, 17 tons of ivory are estimated to have left the Okapi Reserve; this would suggest that over 400 elephants were killed, possibly twice that number.

Despite this trauma, it is estimated that the Okapi Reserve continues to enclose some of the highest biodiversity of the DRC's forests, including the highest density of large mammals. At the onset of the war the Reserve contained at least 5,000 elephants, and as many as 10,000 elephants

lived in the 45,000 km² that constitute the primary elephant range within the Ituri Forest. When a re-count was conducted in 1998, all large mammal populations seemed stable. Since then poaching has escalated, but the partial census conducted so far in 2005 has indicated that important elephant populations remain in at least a few areas.

When the Okapi Reserve was nominated as a World Heritage site in 1996, the expectation was that its legal status, or at least that of its central core, would rapidly change to that of a National Park. Whereas a Park is created at the top level of Government, a Reserve is created by decree of the Environment Minister and it is a weak, easily reversed status. With the onset of war it was no longer possible for Ituri conservationists to lobby the government for a change in the legal status of the Reserve. Yet although recently created and still a 'Reserve', the Okapi Reserve enjoyed relative protection during the war and probably became more of a fact for its neighbouring villages than many of the older parks. The reasons for this were presumably the well-trained personnel, the continued presence and activity of conservation NGOs, diplomatic action targeting the Reserve, and the development of Reserve infrastructure. UNESCO's World Heritage Centre sent several missions to the DRC during the war, to promote conservation in the country's World Heritage sites. The ICCN also received financial support, from both the United Nations Foundation-funded UNESCO Programme for the Conservation of the Five DRC World Heritage Sites and the United States Fish and Wildlife Service; these allowed the continuation of management operations throughout the war. In the year 2000 the ICCN, with its partners GIC and WCS, carried out a mixed mission (ICCN guards with military) to oust poachers and miners from the Reserve. Additionally a monitoring team tracked poaching, the market for ivory, and the bush-meat trade.

Importantly, it was during the war that the necessity of a landscape approach for successful conservation of the Reserve was recognized by the Parks Administration (ICCN) and on-site conservation NGOs. In order to successfully zone the interior of the Reserve pressure from the outside had to be reduced, and effectively zoning a larger landscape would thus be preferable. Two separately initiated strategies can make this landscape vision a reality:

- USAID's CARPE, in the context of its Congo Basin Forest Partnership, is promoting a focus on the landscape level for all conservation initiatives that it supports. Among the targets for its fourth year of activity is a land use planning process in eight of 12 landscapes, bringing together the principal stakeholders from the entire land area defined as a landscape. The Okapi Reserve is part of one of these landscapes, and is already supported by a 'landscape team' that is developing the necessary contacts and conventions.
- The Congolese government itself, through its new forestry code, has opened the door to this geographically coordinated approach by calling for large-scale zoning. To be effective this will require collaboration between village communities, commercial logging societies, and protected areas. In terms of basic infrastructure and legal frameworks, the DRC is poised to move towards the application of landscape solutions to conservation problems.

The uncertainty lies in the financing, and in the assurance that competent individuals and adequate supporting teams are in place to take responsibility. If successful, such a landscape approach could curb the influx of people to the Reserve and eliminate encroachments by deflecting miners to other parts of the landscape.

WEST CENTRAL AFRICA: WORLD HERITAGE IN THE MAKING ON A LANDSCAPE SCALE

Moving West and lower into the Congo Basin, there is a large area of forest with high biodiversity, important endemic plants and animals, and only two World Heritage sites: Dja in Cameroon and Salonga in the DRC. Entire countries with important forests, including Gabon, the Republic of Congo (RC), and the Central African Republic (CAR), have no World Heritage sites despite the clear global importance of their forests. The global importance of the tropical forests of Central Africa lies in their diversity of species, and their sheer size as large, intact ecosystems. At national and local levels these forests provide goods for subsistence and commerce to local communities, and are thus intimately linked to the social and economic development of the countries concerned. The adoption of a sustainable use paradigm by governments and donor agencies has underlined the potential of these forest ecosystems to provide for the present and future needs of the people. An understanding of the major threats to this forest resource, and an attempt to mitigate them, are clear priorities for national governments, bi- and multilateral donors, and international NGOs.

In March 1999 seven Central African states committed themselves, through the Yaoundé Declaration, to an ambitious plan for the sustainable management of their forests including legal protection of 10% of the forest area, and particularly of trans-boundary ecosystems. This created a favourable political climate for forest conservation, and led to increased funding from the international community; a number of national and regional projects to support conservation and sustainable development are thus ongoing, or planned, in order to assist governments to implement the objectives of the Yaoundé Declaration. New partnerships are beginning to emerge in this context, involving several UN agencies, international conservation NGOs and, in the case of the logging industry, the private sector. The management of protected areas is a sector that depends heavily on international assistance, and the system of World Heritage sites brings recognition of the global importance of forest protected areas in the region. Promotion of the concept of World Heritage forests

creates a framework, for the inclusion of the entire landscape necessary to protect essential natural treasures.

Unlike the eastern Ituri region, where mining and population immigration are major problems, in the western part of Central Africa illegal hunting and the commercial trade in bush-meat represent the principal threat. It is a danger not only to the animal species concerned, but also to the integrity of their habitats. Unsustainable levels of hunting are driving vulnerable species of animals such as elephants, gorillas, mandrills, and many others to local extinction; this only causes greater hardship to rural populations that are nutritionally and economically dependent on wild game. The primary objective of protected areas is to conserve viable populations of all species, but as some animals become scarce or disappear from other forests protected areas suffer from increasing poaching. Moreover, protected areas will be unable to function effectively if they become islands surrounded by 'silent' or empty forests: not only will law enforcement become untenable, but ecological resilience will diminish due to the fragmentation of remaining animal populations. To be effective protected area management must take into account the peripheral zones, where the landscape is dominated by timber production and community-managed forests that respond to the needs of national economies and local populations. The corrosion of protected areas can be reduced if neighbouring countries develop collaborative approaches to natural resource management.

To tackle these challenges and preserve globally significant forest landscapes, the UNESCO World Heritage Centre together with the FAO, regional governments, and international conservation NGOs (Conservation International, ECOFAC, The Jane Goodall Institute, WCS, and WWF) launched in 2002 the Central African World Heritage Forest Initiative (CAWHFI). The Initiative takes aim at the increased threat of an unregulated bush-meat trade by promoting its management in trans-boundary clusters of forest protected areas, whose outstanding characteristics justify World Heritage status and constitute the very best examples of natural heritage in the Central African rainforest zone. Improving the ability of national administrations to enforce legislation on protected areas and on the hunting and trade of wild animals, and analysing and mitigating the increasingly unsustainable bush-meat trade, are the two major themes of the CAWHFI project. Taking into account priority conservation sites identified by governments and by the international scientific community, the CAWHFI partners specified three trans-border landscapes for the programme. The three zones, Gamba/Conkouati between Gabon and Congo, Odzala/Minkébé/Dja/Boumba/Nki between Congo, Gabon, and Cameroon, and the Sangha Tri-National Protected Area between Cameroon, the CAR, and Congo, include ten existing protected areas embedded in forest landscapes (see Table 1 below)

The main objective of the CAWHFI is to improve the sustainable management of these three ecological landscapes, which include protected areas of global significance that could be proposed for inclusion in the World Heritage List. To achieve this objective, the partners to the initiative recognize that it is not only necessary to improve the management of the protected areas in order to bring them up to 'World Heritage standards', but also to improve the management of natural resources in the landscapes that surround these protected areas and in particular the management of wildlife resources. In fact, in spite of the large size of the protected areas involved, scientific evidence suggests that if these protected areas were isolated they would lose part of their biodiversity. For example, Steve Blake of WCS was able to show that elephants outfitted with radio collars in Nouabale-Ndoki National Park migrate

Table 1: **Protected areas included in the three CAWHFI landscapes**

Landscape	Landscape area (km²)	Protected Area	Country	Size of Protected Area (km²)
Sangha Tri-National	48,300	Dzanga-Sangha	CAR	4,380
		Nouabale-Ndoki	RC	4,000
		Lobeke	Cameroon	2,000
TRIDOM	153,100	Dja, Boumba-Bek/ Nki	Cameroon	5,250 6,930
		Minkebe, Ivindo	Gabon	7,500 3,000
		Odzala	RC	13,600
Gamba-Conkouati	34,400	Gamba	Gabon	11,320
		Conkouati	RC	5,040
		Mayumba	Gabon	80

over vast tracts of land in search of food (see Figure 2). Therefore, any approach focusing on the conservation of biological wealth in key protected areas clearly needs to take into account the sustainable use of natural resources in their surrounding landscapes.

Initial funding for the programme, granted by the United Nations Foundation, targeted the management of the protected areas; UNESCO's World Heritage Centre has been working with its partners and the French Global Environment Fund to develop an additional project component, targeting the management of faunal resources in the forest landscapes around the protected areas. This project was approved for execution in November 2005, and will develop wildlife management plans to regulate hunting in close cooperation with different stakeholders such as local communities and foresting companies. Building on the experience already developed by WCS and WWF in the region, a particular effort will be made to involve traditional hunters. The project will test some new innovative approaches to tackle the bush-meat issue, including the empowerment of local indigenous hunting groups to control wildlife populations in their traditional hunting areas and the development of innovative alternatives to bush-meat consumption such as fishing.

CONCLUSION

In the two cases presented here, one from east Central Africa and the other from west Central Africa, the insufficiency of protected areas alone to guarantee natural resources in the long term was addressed by expanding the pertinent geographic area. This also meant extending the conservation 'message' to a wider group of stakeholders. As a result the message changed, and so did conservation.

The reasons and background differ for the two landscapes. The Ituri Forest lies within a single country, the Democratic Republic of Congo, and has only a single protected area, the Okapi Reserve. In the Ituri Forest this Reserve is an established World Heritage site, in which effective control of threats to biodiversity requires landscape-scale measures that reach far beyond the Reserve's limits but remain nevertheless within national boundaries. The second case involves four countries and numerous protected areas; the forest matrix between protected areas harbours World Heritage species that would undoubtedly be threatened if only single areas were managed. The protected areas therefore function in combination, and through control of their connecting forests, to guarantee the World Heritage values of the whole. To be effective, the management of this complex of areas requires cooperation across national borders.

The immediate justifications for conservation beyond the borders of protected areas also differ between the two cases. In the Ituri Forest, management conditions are affected by long-standing social unrest such that conservation now depends on a local- or landscape-level commitment to conservation. The landscape focus speaks to a need for decentralized initiative and control, in order to make conservation work. In the multi-country, west Central African instance, management of the bush-meat trade is pushing conservation to a level of coordination beyond the national scale to one of multi-country cooperation.

Yet the same fundamental problem remains: protected areas, and particularly forested protected areas in diverse tropical environments, must be considered beyond their legal borders if they are to achieve their conservation objectives. The distribution of plant species and large mammals is not a matter of simple physical delimitation; nor does their current occurrence within a protected area imply that the protected area is adequate to maintain the species in the long term. In all cases the threats to a protected area come from the surrounding landscape, whether that of immigration into the reserve or of a tightening vice of resource depletion, or something else altogether. Equally important, as the area of conservation grows so must the group of stakeholders, and the conservation message itself must find a wider audience. Whereas effective conservation in many regions calls for an expanded landscape approach, in Central Africa there is a particular urgency to this need because of high diversity, the presence of large space-demanding mammals, and the fragility of national structures responsible for enforcement.

ILLUSTRATIONS

Figure 1. The Okapi Wildlife Reserve in the Ituri Forest landscape

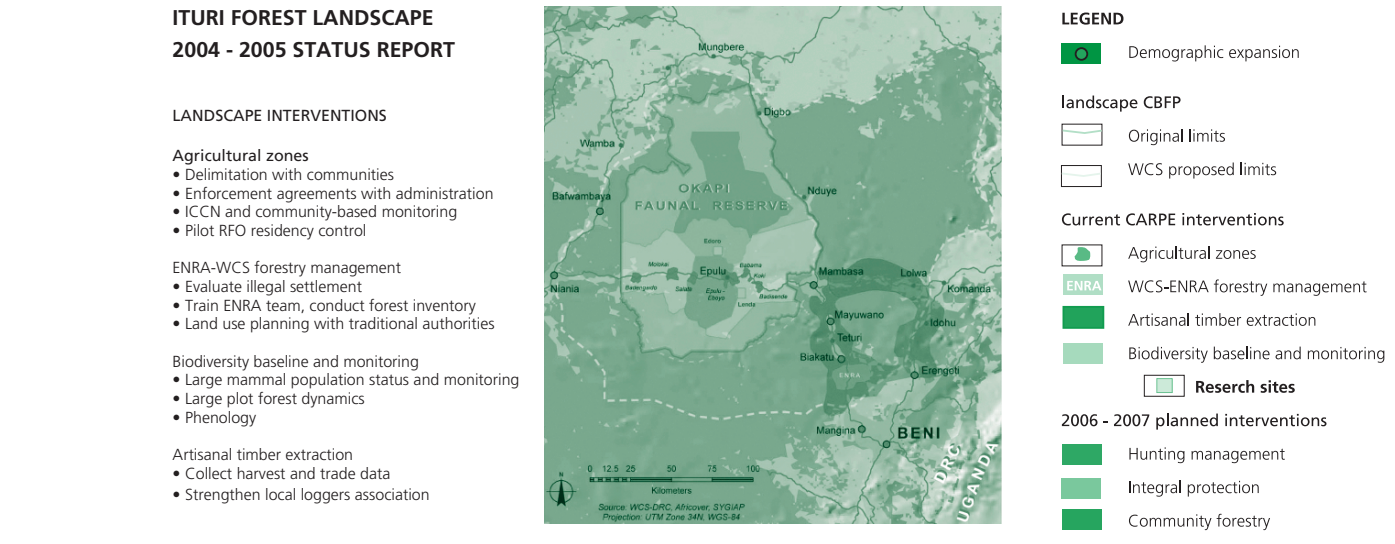
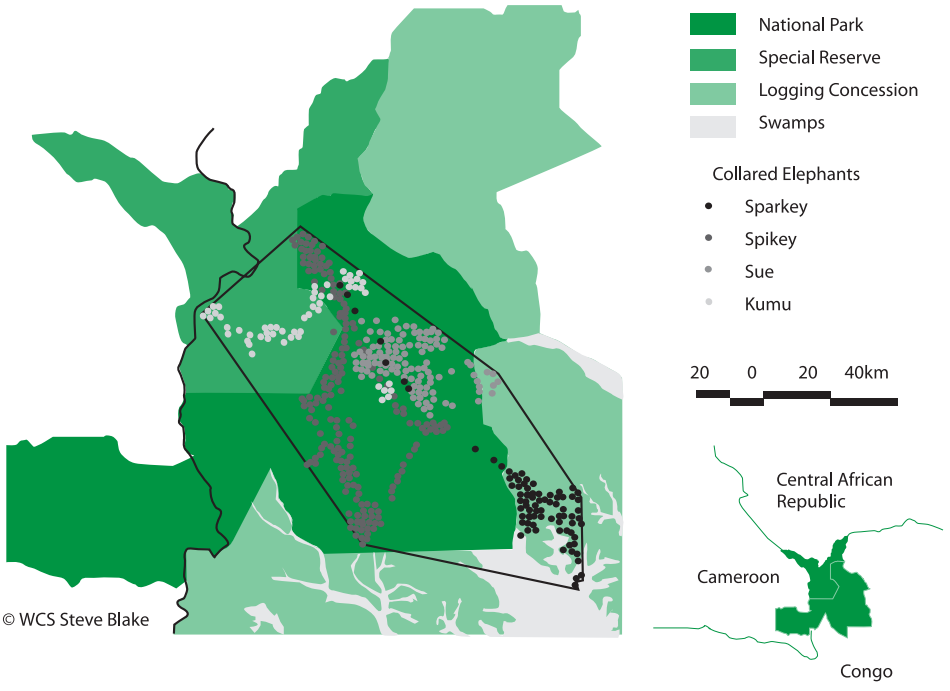


Figure 2. Elephant movements in the Sangha Tri-National Protected Area



16

Integrating World Heritage Sites into a New Protected Areas System: The Case of Madagascar

Vololoniaina Rasoarimanana[1]

[1] United Nations Development Programme/Global Environmental Facility, Small Grants Programnme (UNDP-GEF SGP) COMPACT

Integrating World Heritage Sites into a New Protected Areas System: The Case of Madagascar

Madagascar is preparing a submission for the inscription of natural sites on the World Heritage List. All the sites concerned are included in the national network of Protected Areas (PAs), which is currently being recast as a pluralistic system comprising the different IUCN categories and providing for modes of management that are open to various stakeholders. Such a pluralistic system links the aims of conservation with sustainable development, involving the sustainable exploitation and management of natural resources and contributing to poverty reduction and improved local governance through the equitable sharing of benefits. In this context, the goals and content of capacity-building must be reviewed. This paper argues for boldness in entrusting local communities with management responsibilities, and for funding granted to them on a par with that to other stakeholders.

NATIONAL CONTEXT

Madagascar's mega-biodiversity is recognized the world over; as a result it has been classified among the world's 34 'biodiversity hotspots', according to the NGO Conservation International. Over 80 percent of all the flora and fauna are endemic, and this biodiversity is distributed over five eco-regions throughout the island. The forest ecosystems range from tropical rainforests, through high-altitude ecosystems, to thorny dry forests. Lake, marine, and coastal ecosystems are also represented. Currently, the protected areas defined under the protected areas code (*code des aires protégées*) are included in a national network whose management is entrusted by the State to a quasi-governmental organization, the National Association for the Management of Protected Areas in Madagascar (ANGAP). The national network comprises some 40 protected areas in IUCN categories I and II, *i.e.* it is composed exclusively of strict nature reserves and national parks. The network managed by ANGAP covers 1.8 million hectares.

Since 1996, Madagascar also has a law on secure local management (*gestion locale sécurisée*) that enables the State to transfer the management of natural resources to local communities. The intention of this law is the sustainable management, or conservation, of natural resources by local communities. However, the resources or lands transferred to the communities are not recognized as protected areas under the current protected areas code. At the World Parks Congress in Durban in 2003, the President of the Republic of Madagascar undertook to increase the island's protected areas to 10 percent of its total surface, namely six million hectares (or more than three times the current area of the network).

As a priority, the areas currently under protection contain sites with a high density of endemic biodiversity; however a large number of exceptional sites, important ecosystems, and endemic species are still outside the scope of the network and there are no legal provisions governing their management. The gradual but effective moves towards decentralization and the delegation of more power, responsibility, and resources to decentralized communal and regional authorities favours a change in the governance of protected areas in the country; it could therefore present significant opportunities to bring the above areas into the PA network.

PROTECTED AREAS PROPOSED FOR INCLUSION IN THE WORLD HERITAGE LIST

Madagascar currently has only one natural World Heritage site, an outstanding site of geological pinnacle formations going back millions of years: the Tsingy de Bemaraha, which is included in the country's network of protected areas and was classified a natural World Heritage site in 1990. Madagascar is proposing two clusters of protected areas, for inclusion in the World Heritage List in the coming years. The first consists of six protected areas in the eastern eco-region, featuring tropical rainforests. The second concerns an extension to the World Heritage site of the Bemaraha pinnacles in the western and southern eco-region, encompassing dry tropical forests and marine and coastal areas.

THE NEW CONCEPTION OF PROTECTED AREAS IN MADAGASCAR

The new challenge of tripling the protected areas has the twin aims of conservation and sustainable development, which are not necessarily at odds. The potential complementarities of these two aims are in fact a prominent feature of the country's quest for sustainable and equitable development. The proposed aims of this reform are currently defined as follows:

- Ensuring that conservation is representative of the biodiversity in the protected areas, including maintenance of the genetic bridge (connectivity).
- Ensuring the sustainability of essential ecological services: preserving the climate, and meeting human needs in terms of health, energy, and production.
- Turning natural sites and ecosystems into resources, in both economic and cultural terms.
- Using and managing natural resources in a sustainable manner to promote poverty reduction and national development.
- Involving different social and population groups in the governance of protected areas, with a view to equitable profit-sharing.

To reach these goals, it is helpful to consider Madagascar's PA system in light of the six IUCN categories: strict nature reserves, national parks, natural monuments, habitat/species management areas, protected landscapes/seascapes, and managed resource protected areas.

Various forms of governance would be possible for these different management goals: state-controlled or state-delegated management, joint management by various parties, private management, and local community management involving various forms of governance.

The government's acceptance of this framework is expected shortly, and will be a major enhancement to the current protected areas code, which limits recognition of national network protected areas to IUCN category I and II sites managed by ANGAP. The main effects and impact of this extension of scope are expected to include:

- More effective conservation of species, ecosystems, and sites.
- More efficient management of protected sites, through involvement of local parties and distinct from reliance on conservation experts.
- A meaningful contribution to poverty reduction and sustainable development.

This new conception of protected areas in Madagascar implies a new vision of and spatial approach to the management of biodiversity and natural resources, and a commitment of the various parties involved to review their capacity-building goals aimed at improved governance and equitable profit-sharing.

THE MANAGEMENT OF BIODIVERSITY: VISION AND SPATIAL APPROACH

In order to reconcile the conservation and sustainable use of resources, the range of resources within a given area must be taken into account. In this way it is possible for protected natural resources, and areas with other functions or management objectives, to coexist. For example, a corridor linking a strict nature reserve and a national park can also be a 'protected area' managed by local communities, in collaboration with the decentralized communal or regional authorities. This approach makes it possible to provide a balance between the needs of the population and the resources available in the territory. However, managers and repeat users of resources can only contribute to the goals of sustainable development if they are involved in the *definition* of the area and of the purposes for which it will be used. They should also be beneficiaries of the measures, as an incentive to conserve such areas and turn them into natural resources.

COMMITMENT OF THE VARIOUS PARTIES

A practice initiated by regional authorities and by the managers of certain protected areas in Madagascar has shown itself effective in getting different groups involved, and getting them to take on responsibility for conservation: in the first instance this entails fostering the establishment of an entity or group for project consultation, planning, and coordination at the communal and regional levels. Such groups might include regional sustainable development committees or similar bodies, which exist in a number of regions including those of the World Heritage sites of Bemaraha, the Mananara-Nord Biosphere Reserve, and Menabe. The latter region has forest ecosystems containing important endemic resources, and whose management has been transferred to local communities, but which do not yet enjoy any official protected status.

Regional sustainable development committees are made up of representatives of local communities, local authorities, the private sector, civil society, and regional technical and financial partners. Whether regional or communal in scope, these development committees analyse the natural, human, and institutional resources necessary to the projects carried out at their level. Conservation and development work are coordinated through processes involving participatory planning and the sharing of roles and responsibilities, and different stakeholders are responsible for carrying out monitoring and evaluation. An important challenge for the sustainable development committees remains the integration of their protected areas into regional or community development plans and strategies, taking account the varying functions of the areas in question: different conservation or development zones will each have their own land-use and management plans. Be this as it may, the clarification of the roles and responsibilities of public authorities and development agents in each of these PAs will hasten and strengthen the processes of democratization and decentralization (particularly with regard to financial resources).

NATIONAL AND LOCAL FUNDING MECHANISMS

With regard to funding for protected areas and environmental actions, two questions must be addressed: the establishment of a permanent funding system, and the use of subsidiaries in funding. The establishment of trust funds, for protected areas and for communities managing the environment at the national level with international partners, is already a major step in ensuring permanent funding for environmental activities. In order to limit the waste of funds on intermediaries and/or unhelpful studies, the foundations managing the trust funds should allocate a large proportion of the available funds directly to grassroots associations, communities, municipalities, regions, and other executing agencies (such as ANGAP).

With regard to the technical, organizational, and financial management of activities, NGOs and service providers can play a supportive role in relation to local communities and other beneficiaries. The supporting budget should be transparent, and managed separately from the investment budgets at the level of the communities and local authorities. In working with the private sector and with producers and users of natural resources, mechanisms for the

local taxation of local resources or products need to be developed. Those who benefit from protected areas are not only those living locally but also tourists, researchers, and city and country dwellers from both the national and international communities. The collection and redistribution of taxes, dues, and rebates should be divided equally between the different levels. Legally and rightfully, the introduction of such a system must be combined with a campaign of civic education and public information conducive to good local governance; this new conception of protected areas thus has a role to play here as well. Civic participation, transparency, accountability, and the enhancement of management capacities and public services will be promoted in the hope of reducing the disparity of access to resources. Consequently, the idea of strengthening the capacities of those involved in the management of protected areas is not applicable solely to the institutions managing the protected areas, but extends to all cogs in the machine. An overall view will make it possible to target the actions of each support body, and the relevant partnerships among stakeholders.

BALANCED REINFORCEMENT OF STAKEHOLDER CAPACITY

The goal of equitable sharing of the benefits deriving from World Heritage sites, and from the conservation and sustainable management of natural resources in general, entails an account of the recipients' benefits and obligations. Fifteen years into the implementation of the Malagasy National Environmental Action Plan, the groups involved present a range of capacity levels.

The bodies responsible for managing protected areas, such as ANGAP, are concerned primarily with the technical running of the sites in accordance with their development and management plans. Facilitating the involvement of other actors, such as local communities and decentralized authorities, in the sustainable management of natural resources is desirable; the protection of the sites and the development of the area should be priority concerns. In particular, other actors could prepare and distribute information on the economic, social, cultural, and scientific benefits that protected areas bring. In this regard the capacities of local communities, whether or not they have been given resource management responsibilities, seem to be underestimated. Admittedly illiteracy and lacking experience are commonplace in rural areas, but grassroots communities do become involved when actions and projects are seen to yield economic, social, and cultural benefits. The marginalisation of local communities should not be an excuse for denying them management responsibility for natural and/or financial resources. In some instances tasks and responsibilities are entrusted to community members without any compensation for their time or energy, on the grounds that they benefit from the conservation and development activity. Yet biodiversity is proclaimed to be of global value, and community members have major roles to play in defining the uses to which the areas concerned will be put: they will be involved in ecological monitoring, overseeing and implementing development and conservation activities, and follow-up and evaluation.

Informing and sensitizing local communities and authorities will strengthen their capacity, and encourage self-assessment and self-improvement. Local civil society, including various associations and NGOs, can be the driving force of development in local communities. However it is important to develop a mechanism for distinguishing between true community leaders and opportunists, where the latter take advantage of the poverty of others and enrich themselves unilaterally. The ethical qualities, technical abilities, and interpersonal skills of the people supporting the development effort are of prime importance at every stage. Separating the resources destined for the local communities from those enabling NGOs or service providers to support those communities might be one way of clarifying respective interests, roles, and responsibilities.

Local authorities, in the form of *communes*, have been newly established as part of the decentralization process in Madagascar. They are beginning to discharge their responsibilities, and resources may be allocated to them directly under procedures that vary according to their management and follow-up capacity. Support for their activities will clarify various roles and responsibilities and set precedents of good governance such as participation, transparency, accountability, effectiveness, and efficiency. Assuming responsibility for practical projects will strengthen management capacity; raise credibility among the general public; and lead to other activities within the *communes*' remit and fields of competence.

In the absence of a substantial and profitable market, the benefits deriving from the development of a locality's natural resources or products would remain at the level of self-consumption or highly localized trading. Development agencies have often found it difficult to work with the private sector where no clear visions, division of roles and responsibilities, or ground rules were in place. However, even in the case of niche markets with an ethical dimension, such as fair trading, organic products, ecological and cultural tourism, 'slow food', and so forth, a product-pathway approach involving labels specifying origin (country, region, or community), quality of raw materials (natural fibres or organically produced), or type of manufacture (crafted or handmade) is to be recommended. Where there is a joint definition of the vision of sustainable development, private economic operators in urban and rural areas alike will be key partners in initial investments, market research, communication, and capacity-building: after all they possess the necessary resources in qualitative and quantitative terms.

In the case of productive investments, framework regulations supporting initiatives and investments by rural parties remain lacking in Madagascar; the same can be said with

regard to access to, and encouragement of, investment and entrepreneurship.

CONCLUSION

If the governance of protected areas in Madagascar (including World Heritage sites) is to be effective in the long term, such sites must be integrated into their surroundings through inclusion in the work plans of local authorities, community leaders, and other local stakeholders. Financial flows, delegation of authority, and capacity-building directed towards grassroots communities must be geared to that vision. 'Rational' support, including adequate technical expertise and budgetary transparency, remain important at this stage in Madagascar.

annex 1

World Heritage Forest Indicator Database

World Heritage Forest Indicator Database[1]

(an electronic version for data access and processing is available at: http://whc.unesco.org/en/forests/)

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
Argentina	Iguazu National Park	1984	SbTr	55,000	55,000	100	16	14	12	9	9	6	0	0
Australia	Central Eastern Rain-forest Reserves	1986	SbTr	370,000	370,000	100	12	12	12	12	5	5	0	0
Australia	Fraser Island	1992	SbTr	166,283	166,283	100	24	24	24	24	17	10	0	0
Australia	Kakadu	1981	Trop	1,980,400	1,934,400	98	68	73	78	81	86	76	0	0
Australia	**Tasmanian Wilderness**	1982	Temp	1,081,348	1,081,348	100	81	71	64	55	43	46	0	0
Australia	Wetland Tropics of Queensland	1988	Trop	894,420	894,420	100	58	56	47	40	33	23	0	0
Belarus/ Poland	**Beloveshskaya Pushcha/ Bialowieza Forest**	1979	Temp	92,916	92,916	100	60	53	58	63	68	73	0	0
Bolivia	Noel Kempff Mercado National Park	2000	Trop	1,523,446	1,520,196	100	0	0	0	0	0	0	0	0
Brazil	*Atlantic Forest Southeast Reserves*	1999	Trop	470,000	470,000	100	0	0	0	0	0	0	0	0
Brazil	Brazilian Atlantic Islands (Fernando Noronha archipe-lago and Atoll das Rocas)	2001	Trop	42,270	2,600	6	0	0	0	0	0	0	0	0
Brazil	**Central Amazon Conservation Complex**	2000	Trop	6,096,000	6,076,000	100	0	0	0	0	0	0	0	0
Brazil	**Cerrado Pas: Chapada dos Veadeiros and Empas NPs**	2001	Trop	197,382	105,074	53	0	0	0	0	0	0	0	0
Brazil	*Discovery Coast Atlantic Forest Reserves*	1999	Trop	111,930	111,930	100	0	0	0	0	0	0	0	0
Brazil	Iguaçu National Park	1986	SbTr	170,000	170,000	100	65	56	49	54	68	73	1999	2001

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
Brazil	***Pantanal Conservation Area***	2000	Trop	187,818	187,818	100	0	0	0	0	0	0	0	0
Bulgaria	**Pirin National Park**	1983	Temp	27,400	16,440	60	27	39	51	63	68	53	0	0
Cameroon	**Dja Faunal Reserve**	1987	Trop	526,000	526,000	100	60	53	58	63	68	73	0	0
Canada	*Canadian Rocky Mountains Parks*	1984	Bor	2,306,884	1,153,442	50	58	51	44	37	40	50	0	0
Canada	Gros Morne National Park	1987	Bor	180,500	162,450	90	24	24	24	24	17	10	0	0
Canada	Nahanni National Park	1978	Bor	476,560	476,560	100	5	12	24	36	36	36	0	0
Canada	Wood Buffalo National Park	1983	Bor	4,480,000	4,480,000	100	11	21	33	42	42	39	0	0
Canada/USA	**Waterton Lakes Glacier International Peace Park**	1995	Bor	457,614	457,614	100	0	0	0	0	0	0	0	0
China	**Huanglong Scenic and Historical Interest Area**	1992	Temp	70,000	70,000	100	12	12	5	5	5	5	0	0
China	**Jiuzhaigou Valley Scenic and Historic Interest Area**	1992	Temp	72,000	72,000	100	18	17	10	10	10	10	0	0
China	Mount Huangshan	1990	Temp	15,400	15,400	100	17	17	10	10	10	8	0	0
China	Mount Taishan	1987	Temp	25,000	20,000	80	12	12	5	5	5	5	0	0
China	Mount. Emei	1996	SbTr	15,400	13,400	87	0	0	0	0	0	0	0	0
China	**Mount. Wuyi**	1999	SbTr	99,975	99,927	100	0	0	0	0	0	0	0	0
China	*Sichuan Giant Panda Sanctuaries*	2006	Temp	924,500	924,500	100							0	0
China	Three Parallel Rivers of Yunnan Protected Areas	2003	Temp	1,698,419	1,698,419	100				60	60	60	0	0
Colombia	Los Katios	1994	Trop	72,000	72,000	100	48	48	42	34	27	20	0	0
Costa Rica	Area de Conservation Guanacaste	1999	Trop	88,000	88,000	100	0	0	0	0	0	0	0	0
Costa Rica	Cocos Island National Park	1997	Trop	197,400	2,390	1	0	0	0	0	0	0	0	0

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
Costa Rica/ Panama	**Talamanca Range - La Amistad Reserves /La Amistad NP**	1983	Trop	791,592	791,592	100	28	19	29	29	26	23	0	0
Croatia	Plitvice Lakes National Park	1979	Temp	29,482	20,889	71	52	43	34	32	30	25	1992	1997
Cuba	Alejandro de Humboldt National Park	2001	Trop	71,140	68,890	97		0	0	0	0	0	0	0
Dominica	Morne Trois Pitons National Park	1997	Trop	6,857	6,857	100	45	36	49	37	22	15	0	0
DR Congo	Kahuzi-Biega	1980	Trop	600,000	600,000	100	73	78	83	86	89	91	1997	2006
DR Congo	Okapi	1996	Trop	1,375,625	1,375,625	100	60	85	85	85	80	85	1997	2006
DR Congo	Salonga	1984	Trop	3,600,000	360,000	10	36	48	60	65	70	75	1999	2006
DR Congo	Virunga National Park	1979	Trop	790,000	632,000	80	80	85	88	91	94	97	1994	2006
Ecuador	Sangay National Park	1983	Trop	271,925	271,925	100	94	97	100	100	100	100	1992	2005
Guatemala	**Tikal National Park**	1979	Trop	57,600	57,600	100	17	17	8	8	8	8	0	0
Guinea/Ivory Coast	**Mount Nimba Strict Nature Reserve**	1981	Trop	35,130	35,130	100	97	97	100	100	100	100	1992	2006
Honduras	**Rio Platano Biosphere Reserve**	1982	Trop	500,000	500,000	100	68	73	78	80	85	88	1996	2006
India	Manas Wildlife Sanctuary	1985	Trop	39,100	39,100	100	91	94	97	97	97	100	1992	2006
India/Bangladesh	**The Sunderbans National Park**	1987	Trop	728,000	678,500	93	36	41	41	34	34	27	0	0
Indonesia	Lorentz National Park	1999	Trop	2,500,000	2,500,000	100	60	60	60	60	65	70	0	0
Indonesia	*Tropical Rainforest Heritage of Sumatra*	2004	Trop	2,500,000	2,500,000	100					60	60	0	0
Indonesia	Ujung Kulon National Park	1991	Trop	78,359	76,200	97	0	0	0	0	0	0	0	0
Ivory Coast	**Comoe National Park**	1983	Trop	1,149,250	1,149,250	100	27	27	39	44	49	58	2003	2006

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
Ivory Coast	**Tai National Park**	1982	Trop	330,000	330,000	100	12	12	21	30	27	24	0	0
Japan	Shirakami - Sanchi	1993	SbTr	16,971	16,971	100	20	13	10	10	8	8	0	0
Japan	Shiretoko	2005	Temp	561,000	532,450	95						0	0	0
Japan	**Yakushima (Yaku - island)**	1993	SbTr	10,747	10,747	100	12	6	5	5	5	5	0	0
Kenya	**Mount Kenya National Park/Natural Forest**	1997	Trop	142,071	142,071	100	45	36	48	49	34	27	0	0
Madagascar	Tsingy de Bemaraha Strict Nature Reserve	1990	Trop	152,000	152,000	100	5	8	5	4	3	3	0	0
Malaysia	Gunung Mulu National Park	2000	Trop	52,864	52,864	100	60	60	40	30	24	17	0	0
Malaysia	Kinabalu Park	2000	Trop	75,370	75,370	100	0	0	0	0	0	0	0	0
Mexico	**Sian Ka'an Biosphere Reserve**	1987	Trop	528,000	408,000	77	12	24	36	48	48	41	0	0
Montenegro	**Durmitor National Park**	1980	Temp	34,000	34,000	100	47	38	29	29	39	34	0	0
Nepal	Royal Chitwan National Park	1984	Temp	93,200	78,200	84	47	52	55	67	64	54	0	0
New Zealand	Te Wahipounamu	1990	Temp	2,600,000	2,000,000	77	39	42	39	40	31	31	0	0
New Zealand	Tongariro National Park	1990	Temp	79,596	79,596	100	41	53	46	39	37	30	0	0
Panama	Coiba National Park and its special Zone of Marine Protection	2005	Trop	270,100	53,500	20						0	0	0
Panama	**Darien National Park**	1981	Trop	597,000	597,000	100	0	0	0	0	0	0	0	0
Peru	Historic Santuary of Machu Picchu	1983	Trop	32,592	32,592	100	0	0	0	0	0	0	0	0
Peru	**Manu National Park**	1987	Trop	1,532,806	1,532,806	100	8	6	3	0	0	0	0	0
Peru	Rio Abiseo National Park	1990	Trop	274,520	274,520	100	0	0	0	0	0	0	0	0

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
Phillipines	**Puerto - Princessa Subterra-nean River National Park**	1999	Trop	20,202	20,202	100	0	0	0	0	0	0	0	0
Russian Federation	**Central Sikhote-Alin**	2001	Temp	1,557,523	1,557,523	100		0	0	0	0	0	0	0
Russian Federation	**Lake Baikal**	1996	Bor	8,800,000	5,650,000	64	60	85	85	85	80	85	0	0
Russian Federation	Virgin Komi Forests	1995	Bor	3,280,000	1,672,800	51	24	25	17	13	10	10	0	0
Senegal	**Niokolo- Koba National Park**	1981	Trop	913,000	913,000	100	49	44	39	36	26	28	0	0
Seychelles	Vallee de Mai Nature Reserve	1983	Trop	18	18	100	0	0	0	0	0	0	0	0
Solomon Islands	East Rennell	1998	Trop	37,000	21,500	58	0	0	12	12	24	24	0	0
South Africa	Greater St. Lucia Wetland Park	1999	Trop	239,566	179,674	75	0	0	15	24	24	24	0	0
Spain	Garajonay National Park	1986	SbTr	3,984	3,984	100	3	3	3	3	3	0	0	0
Sri Lanka	**Sinharaja Forest Reserve**	1988	Trop	8,864	8,864	100	41	34	32	32	25	18	0	0
Suriname	Central Suriname Nature Reserve	2000	Trop	1,600,000	1,600,000	100	0	0	0	0	0	0	0	0
Thailand	Dong Phayayen - Huai Khao Yai Forest Complex	2005	Trop	615,500	613,500	100						0	0	0
Thailand	Thungyai - Huai Kha Khaeng Wildlife Sanctuaries	1991	Trop	622,200	618,300	99	29	29	22	15	13	13	0	0
Uganda	Bwindi Impenetra-ble National Park	1994	Trop	32,000	32,000	100	49	44	42	34	25	18	0	0
Uganda	Rwenzori Mountains National Park	1994	Trop	100,000	100,000	100	36	48	60	65	70	75	1999	2004

COUNTRY[2]	WH FOREST SITE[3]	Year Inscribed	Biome	WH Site Size (ha)	Forest Cover (ha)[4]	% Forest cover[5]	Threat Intensity Coefficient[6]						Danger Listing[7]	
							2001	2002	2003	2004	2005	2006	ON	OFF
UR Tanzania	Selous Game Reserve	1982	Trop	5,000,000	4,500,000	90	6	3	3	3	3	12	0	0
USA	**Great Smoky Mountains National Park**	1983	Temp	209,000	209,000	100	12	24	24	24	24	29	0	0
USA	**Olympic National Park**	1981	Temp	362,848	358,548	99	11	9	9	9	6	3	0	0
USA	**Redwood National Park**	1980	Temp	56,883	56,883	100	10	10	10	8	6	6	0	0
USA	**Yellowstone National Park**	1978	Temp	898,349	650,000	72	76	81	83	85	88	91	1995	2003
USA	Yosemite National Park	1984	Temp	308,283	292,869	95	0	0	0	0	0	0	0	0
Venezuela	Canaima National Park	1994	Trop	3,000,000	3,000,000	100	48	44	37	27	27	20	0	0

1 Dec. 2006 version. Available on-line at: http://whc.unesco.org/en/initiatives/26/. On-line version will be updated regularly and may not correspond to printed version.

2 More than one country name in one cell indicates transboundary site.

3 Italicized WH site names indicate serial site (e.g. consisting of more than one non-contiguous protecte area); **bold** WH site names indicate site forms part of a UNESCO Biosphere Reserve.

4 Based on information obtained from desk-top study of WH nomination files and WCMC protected areas database. Great variation in availability and quality of data implies that the figures are indicative only are will be permantly subject to refinement. The authors welcome any information leading to improvement of the figures.

5 Sites with relatively small percentage forest cover usually consist of mixed marine / terrestrial site.

6 0 = minimum threat intensity; 100 = maximum threat intensity. Based on historical frequency of the production of State of Conservation Reports by the WH Centre.

7 For sites still on the Danger List as of 2006, the year is **bolded (2006)**.

annex 2

Threat Intensity Trends for World Heritage Forests, 2001-2006

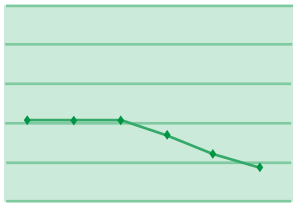
Threat Intensity Trends for World Heritage Forests, 2001-2006

The graphs below were created using the Threat Intensity Coefficients (TIC) developed to provide a measure of the intensity of threats to which the World Heritage values of WH forest sites are subjected. Graphing the TICs provides a rapid visual tool to assess and compare TIC over time, and between sites. All sites presented in alphabetical order. Sites for which the TIC has been zero since 2001 are not included in this list. For numerical values, please consult the WH Forest Indicator Database in Annex I.

Vertical axis: 0-100 (0= lowest intensity, 100 = greatest intensity)
Horizontal axis: Years 2001-2006.

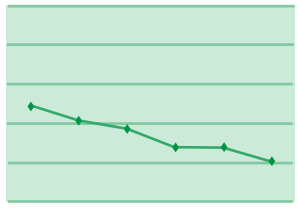
Beloveshskaya Pushcha/ Bialowieza Forest

Bwindi Impenetrable National Park

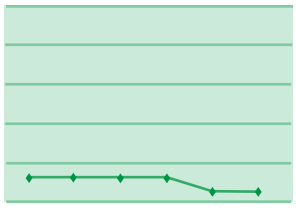


Canadian Rocky Mountains Parks

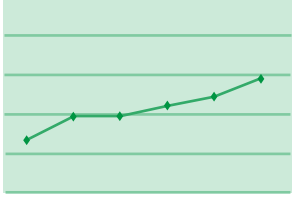
Canaima National Park



Central Eastern Rainforest Reserves

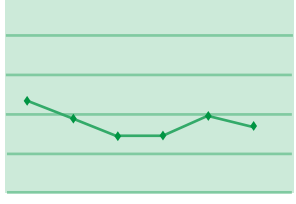


Comoe National Park



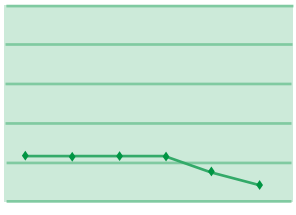
Dja Faunal Reserve

Durmitor National Park



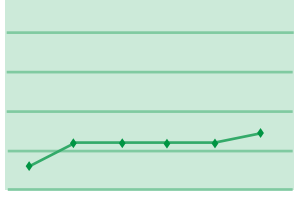
East Rennell

Fraser Island

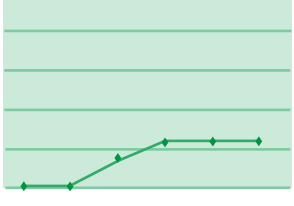


Garajonay National Park

Great Smoky Mountains National Park

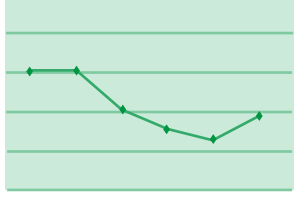


Greater St. Lucia Wetland Park

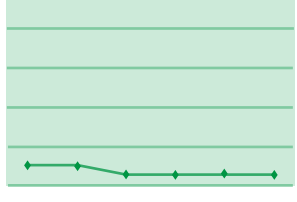


Gros Morne National Park

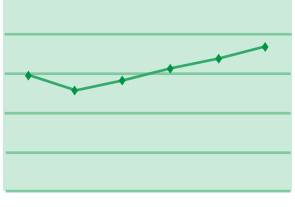
Gunung Mulu National Park



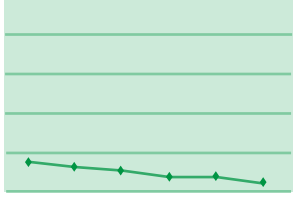
Huanglong Scenic and Historical Interest Area



Iguacu National Park (Brazil)

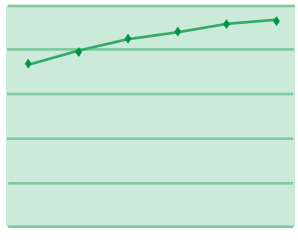


Iguazu National Park (Argentina)



Jiuzhaigou Valley Scenic and Historic Interest Area

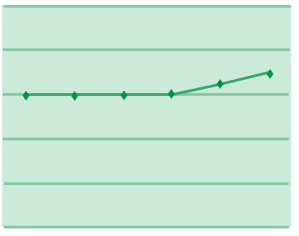
Kahuzi-Biega



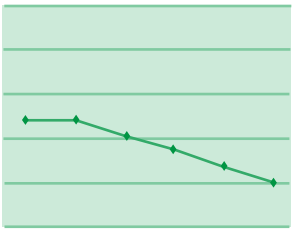
Kakadu

Lake Baikal

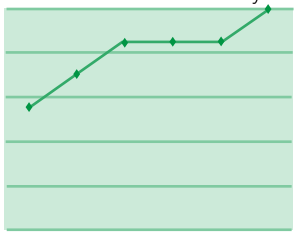
Lorentz National Park



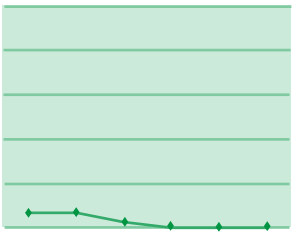
Los Katios



Manas Wildlife Sanctuary

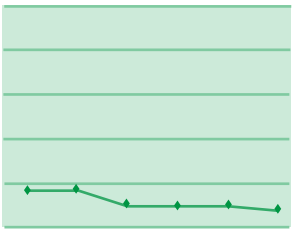


Manu National Park



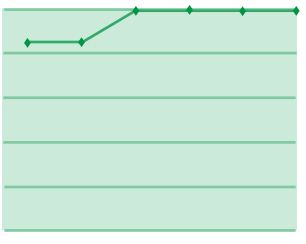
Morne Trois Pitons
National Park

Mount Huangshan



Mount Kenya National Park/
Natural Forest

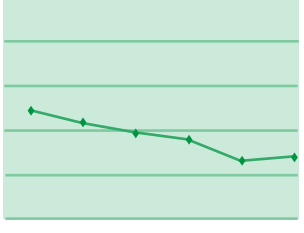
Mount Nimba Strict
Nature Reserve



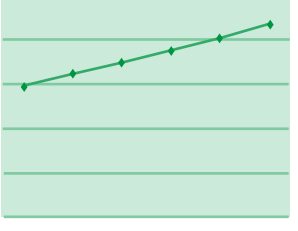
Mount Taishan

Nahanni National Park

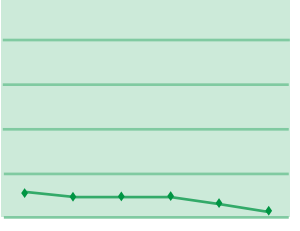
Niokola- Koba
National Park



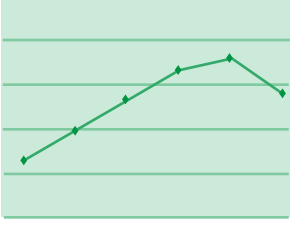
Okapi



Olympic National Park

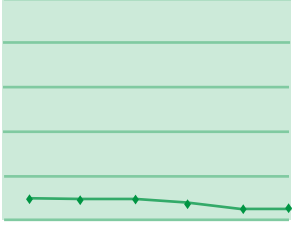


Pirin National Park

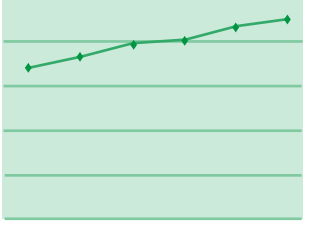


Plitvice Lakes
National Park

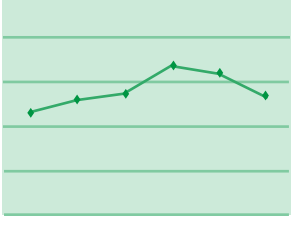
Redwood National Park



Rio Platano
Biosphere Reserve



Royal Chitwan
National Park



Rwenzori Mountains
National Park

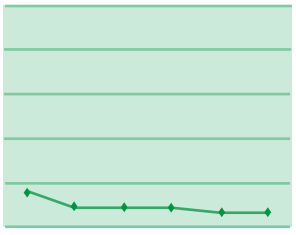
Salonga

Sangay National Park

Selous Game Reserve

Annex 2:
Threat Intensity Trends for World Heritage Forests, 2001-2006

Shirakami – Sanchi

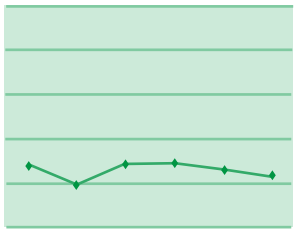


Sian Ka'an

Sinharaja Forest Reserve

Tai NP

Talamanca Range - La Amistad Reserves/La Amistad NP



Tasmanian Wilderness

Te Wahipounamu

The Sunderbans National Park

Thungyai – Huai Kha Khaeng Wildlife Sanctuaries

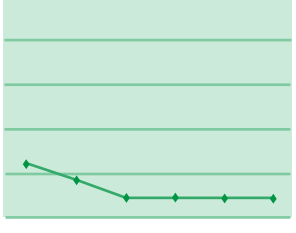
Tikal National Park

Tongariro National Park

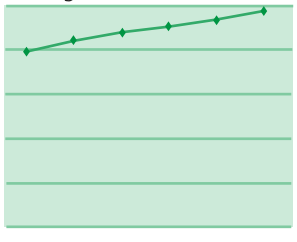
Tropical Rainforest[1] Heritage of Sumatra

Tsingy de Bemaraha Strict Nature Reserve

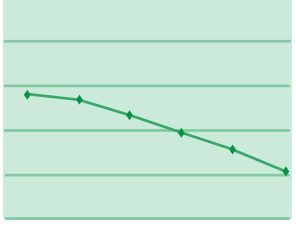
Virgin Komi Forests



Virunga National Park



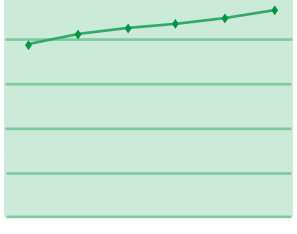
Wetland Tropics of Queensland



Wood Buffalo National Park

Yakushima (Yaku - island)

Yellowstone National Park



[1] Tropical Rainforest Heritage of Sumatra WH site inscribed in 2005 – only 2 data poins (2005, 2006) exist.

Forest Protected Areas Warranting Further Consideration as Potential World Heritage Forest Sites: Summaries from Various and Thematic Regional Analyses

annex 3

Compendium produced by Marc Patry, for the proceedings of the 2nd World Heritage Forest meeting, held at Nancy, France, March 9-11, 2005

Four separate initiatives have been carried out in the past 10 years in an effort to help guide the process of identifying and nominating new WH Forest sites. The first, carried out by Thorsell and Sigaty (1997), addresses forests worldwide, and was developed based on the authors' shared knowledge of protected forests worldwide. The second focuses exclusively on tropical forests and was assembled by the participants at the 1998 WH Forest meeting in Berastagi, Indonesia (CIFOR, 1999). A third initiative consists of potential boreal forest sites developed by the participants to an expert meeting on boreal forests, held in St. Petersberg in 2003. Finally, a fourth, carried out jointly between UNEP and IUCN applied a more systematic approach (IUCN, 2004).
Though aiming at narrowing the field of potential candidate sites, these initiatives do not automatically imply that all of the listed forest areas would meet the criteria for inscription on the WH List, and conversely, nor do they imply that any site left off the list would not meet these criteria. Since these lists were developed, several of the proposed sites have been inscribed on the WH List, while others have been the subject of nominations, but were not inscribed, for various reasons.

The lists below are reproduced here in an effort to facilitate access to this information and to guide future nomination initiatives.

A. IUCN (2004)

An IUCN paper entitled *The World Heritage List: Future priorities for a credible and complete list of natural and mixed sites* (IUCN, 2004) reviews the UNEP-WCMC study (2004), which carries out an extensive exercise whereby existing WH sites were cross-referenced against a variety of classification schemes of world ecosystems, habitat types, biodiversity hotspots and more[1]. The exercise attempted to highlight those areas most indicated as i) representing exceptional biotic values and ii) having little existing WH coverage. IUCN's and UNEP-WCMC's work represent a first real effort at developing a systematic approach to identifying potential natural sites that may merit further consideration for WH nomination. The IUCN paper sifts through the information provided by the UNEP-WCMC study and concludes that humid tropical forests and tropical dry forests are already well represented on the WH list. They note however that there are "*some terrestrial ... habitat types within these biomes which may have potential for WH inscription. These include sites that have been defined as priorities by CI, IUCN/SSC, WWF and BirdLife International. Nominations from any of the areas listed below should receive priority*" – those related to forests include:

- Madagascar moist forests
- Forests in southern Chile and southern Argentina
- Dry and moist forests in New Caledonia (France)
- Western Ghats forests (India)

At the time of writing this annex, a nomination file for the Madagascar moist forests was under consideration by the WH Committee, whereas both India and Chile were known to be working on nomination dossiers for the forest sites listed above.

B. Thorsell and Sigaty (1997)

Sites whose names are in **BOLD** *indicate that they have since been inscribed on the World Heritage List, whereas* <u>*underlined*</u> *sites indicate that nomination dossiers are in preparation, or under consideration.*

Forested Protected Areas which may merit consideration for World Heritage Nomination

This is not an exhaustive list, but an illustration of forest protected areas which may merit consideration for nomination on the World Heritage List.

[1] http://www.unep-wcmc.org/index.html?http://www.unep-wcmc.org/protected_areas/world_heritage/wh_review.htm~main

AREA	COUNTRY	MAIN NATURAL VALUES
NEARCTIC		
1. South Moresby NP	CANADA	147,000 ha temperate rainforest area on the south end of Queen Charlotte Islands in British Columbia; Despite extensive logging in surrounding areas, S. Moresby was protected in 1988 through efforts of local Haida people and Islands Protection Society. Consists of hemlock, other temperate tree species and endemic flora and fauna (blacktail deer).
2. Volcan Nevado de Colima National Park	MEXICO	22,000ha dry pine forest in west, central Mexico; high biodiversity - Mexico contains 10% of world's terrestrial vertebrates (1352) and plant (25,000) species.
3. Kalimiopsis Wilderness and Siskiyou Region	USA	Over 5 million ha wilderness area known for its extensive biodiversity (3500 flora species) and forest habitat; coniferous and mixed evergreen forests; unique landscape of canyons, perodotite, volcanic debris, ophioliote crust, rock ridges, and three wild and scenic rivers; named after a unique pre-ice age shrub, the Kalimiopsis contains over 100 coniferous and hardwood tree species (madrone, pine ,fir, cedar, spruce and 5 sensitive species) and over 200 herbaceous plants and ferns - many endemic and sensitive; one of largest roadless areas in the U.S.
PALEARCTIC		
4. Carpathian Forest Reserve and NP	UKRAINE	20,000ha protected forest area in Zakarpatska region; covers only 4% of the country, but contains 33% of the Ukraine's forest resources, over 50% of plant species (2110 total) and highest forest concentration area (53% of region is forest); severe threats have endangered the area, but structural changes are planned to promote the Carpathians as a recreation zone to reduce the industrial impact; recent projects funded by GEF, the MacArthur Foundation and the World Bank for conservation biodiversity.
AFROTROPICAL		
5. Korup National Park	CAMEROON	126,000ha Biosphere Reserve; contains much of Cameroon's tropical moist and lowland evergreen rainforest with over 3500 flora species; sustainable forestry and community development project.
6. West Gabon Complex	GABON	Expansive tropical lowland & hill rainforest; habitat for baboon, mandrill, colobus monkeys; home to Baka people; numerous flora, fauna and protected areas including Ipassa Makokou (15,000ha Bio Reserve).
7. Montagne D'Ambre Protected Areas	MADAGASCAR	Four protected areas in north Madagascar; tropical dry and moist evergreen forest; one of country's richest areas of biodiversity and ecological diversity; transition zone between dry deciduous and eastern moist forest permits a species rich transition zone with high endemism, karstic pinnacles, caves, etc.; rivers are only year round water source for local people.
INDOMALAY		
8. Andaman Island Protected Areas	INDIA	Six national parks and 94 wildlife sanctuaries on Andaman and Nicobar islands covering 70,800ha; tropical evergreen, semi-evergreen, moist deciduous, beach, bamboo and mangrove forests; high rate of biodiversity of flora species, esp. on Andaman.

9. Western Ghats	INDIA	Over 15 million ha area with eight national parks and 39 wildlife sanctuaries; moist evergreen forest across mountain range; rich in species diversity (84 of India's 112 endemic amphibians); monkeys, squirrels and bats live in tree canopy; deer and elephants browse in lower branches and understorey; clear felling was stopped in mountainous areas by Chipko movement.
10. **Gunung Leuser NP**	INDONESIA (SUMATRA)	one of largest tropical rain forests protected areas in Indonesia (835,500ha); montane, swamp, subalpine and lowland dipterocarp rain forest; over 2000 flora species; Biosphere Reserve, ecosystem development project and Orang-utan Rehab Centre (orang-utans, gibbons, tigers, monkeys, elephants, leopards, Sumatran rhino); waterfalls, hot springs, volcanic rock.
11. Kutai Game Reserve	INDONESIA (KALIMANTAN)	200,000ha Biosphere reserve is best example of tropical rainforest on Kalimantan one of Southeast Asia's largest lowland montane rainforests; 262 dipterocarps and 83% of Borneo's forest species.
12. Irian Jaya Tropical Forest Protected Areas	IRIAN JAYA	Irian Jaya is one of the largest expanses of pristine tropical rainforest (35 million ha) in Southeast Asia; lower montane forests occur below 3000m and upper montane and subalpine forest above 3400m; swamp, eucalyptus, beach, and mangrove (2nd largest behind Sundarbans) forest; sago palm is staple food-source; two national parks and seven nature/game reserves.
13. **Gunung Mulu NP**	MALAYSIA (SARAWAK)	52,900ha protected area with expansive tropical lowland montane rainforest; 2371m Mt. Mulu; limestone massif; high endemism and biodiversity of flora and fauna; inhabited by Penan peoples.
14. Kinabulu NP	MALAYSIA (SABAH)	75,400ha park north Sabah; lowland montane tropical rainforest; high biodiversity with 75 of Borneo's 135 ficus species (13 endemic), and 72 Fagaceae species; 25% of fauna species are endemic, 290 species of butterfly and moth; 4094m Mt. Kinabulu.
15. Taman Negara NP	MALAYSIA (PENISULA)	434,000ha area is one of largest tropical rainforest reserves in Southeast Asia; lowland montane evergreen rainforest, high biodiversity with over 2000 flora species; 2189m Mt. Tahan (highest point on Peninsula); dam project was thwarted in 1970's.
16. Southern Laos Tropical Forest Reserves	LAOS	Most extensive undisturbed tropical evergreen forest region in Laos;, the lowland tropical forest of Belovens Plateau (80,000ha) Xe Piane (15,000ha) and Bung Nong Ngom National Parks have been identified as priority areas for conservation and consist of dense evergreen and semi-evergreen monsoon forests and open deciduous forest in flatter areas; numerous flora and fauna including threatened black gibbon, clouded leopard, tiger, Asian elephant and kouprey; proposed transborder site with Vietnam, Cambodia and Laos.
17. St. Paul National Park	PHILLIPINES	5,800ha park on north portion of Puerto Princesa Island; montane rainforest; subterranean river; high rate of endemism in plants, fungi, birds and reptiles.
18. Horton Plains and Peak Wilderness	SRI LANKA	Remote plateau is Sri Lanka's largest relatively undisturbed montane forest and habitat for many endemic flora and fauna species; the Peak Wilderness is a unique facet of nature of low dense and slow growing forest trees, a stunted species of clustracene(Keena) with its crown interlocked in a web of leaves; foliage of Horton Plains include species such as Rhododendron and magnolia; underlayer of forest has smaller trees and plants.

AUSTRALIA/OCEANIAN		
19. **Rennell Islands**	SOLOMAN ISLANDS	Largest coral atoll in the world (86 x 15km) is mostly covered by dense forest with a 20m tall average canopy with numerous larger remergent trees; numerous endemic flora and fauna species (40% of birds); over 20 orchid species; limestone karsts; andlargest lake in South Pacific (Lake Tungano).
20. Le Popu-Pue NP	WESTERN SAMOA	Extending from central mountains to coast of Opula Island, this park is the best remaining tract of tropical rainforest in Samoa; only 2,857ha in size, but relative to size of island and two other rainforest reserves in W. Samoa (Falealupo and Tafua) comprise 7,000ha.
NEOTROPICAL		
21. Bolivian Amazon Basin Protected Areas	BOLIVIA	Amazonian basin and lowlands of Bolivia are characterised by extensive areas of lowland moist forest and seasonally inundated savannahs; these open landscapes are traversed by numerous rivers bordered by dense gallery forests; within the savannahs, numerous forest islands dot the horizon providing habitat for the maned wolf, giant anteater, Amazon river dolphin and some of the highest concentration of plant species in the world. Protected areas include the Beni Biosphere Reserve (1.3 million ha), Isoiboro Secure (1.1 million ha) and others.
22. **Jau National Park**	BRASIL	2.2 million ha park in Northwest Amazonia; extensive lowland moist tropical and dense evergreen forest; complex variety of forest features including vines, palms, diverse forest species, and numerous vegetation types in the understorey; "centres of endemism" and high rate of threatened species.
23. Xingu National Park	BRASIL	2.2 million protected area in Maro Grosso, lower Amazonia (2nd largest park in Brasil behind Jau); extensive lowland moist tropical forest and river system; complex vegetation and high endemism.
24. Serraniade de Macarena	COLOMBIA	63 0,000ha park in central Colombia; lowland moist, submontane and montane tropical forest; aesthetic beauty in Caño Cristales and stream areas of the buffer zone, vegetation, petroglyphs, Tablazo ridge, Guayabero canyon, and rapids of Angosturas.
25. Sierra Nevada de Santa Marta BR	COLOMBIA	Over 1.5 million ha area in the Cordillera Central, the highest coastal range of mountains in Colombia; rich variety of flora and fauna in the dense rain forest covering the northern slopes; southern slopes are drier; inhabited by the Kogi and Arhuaco Indians; there are no continuous forest above 1,200 m, but trees grow along the rivers up to 1,700 m and provide habitat for numerous flora and bird (15 endemic) species, especially at higher altitudes.

C. Reproduced from CIFOR (1999). The forest areas below were highlighted by the experts reunited at the first World Heritage Forest meeting in Berastagi, Indonesia, in 1998 as being of potential interest as WH Forests.

Global 200 Ecoregion	Countries involved	Sites identified	Potential Groupings
1. Brazilian Atlantic Forests	Brazil Paraguay Argentina	Atlantic Forest SE	cluster 1+2
		Discovery Coast Atlantic Forest Reserves	cluster 3
		Serra Geral	cluster 4
		Aparados da Serra	
		Sao Joaquim	
		Serra do Tabuleiro	
		Morro Grande	cluster 5
		Morro do Diablo	
		Serra do Mar	
		Ilhabela	
		Serra da Bocaina	
		Itatiaia	
		Papagaio	
		Tingua	
		Poco das Antas	
		Desengano	
		Caparao	cluster 6
		Sooretama	
		Linhares	
		Rio Doce	
		Conduru	
		Mangrove Complex of Camamu	
		Chapada Diamantina	
		Muricy	
		Serra da Estrela	
		Yabuti	
2. Northern Andean Montane Forests	Ecuador/Colombia/Venezuela/Peru	Cordillera de Merida	
		Sierra Nevada de Santa Marta	
		Serrania de la Macarena	
		Yasuni NP	
3. Andean Yungas	Ecuador/Colombia/Venezuela/ Peru/Bolivia	Manu (expanded to SW)	
		Tambopata and Candamo	
		Vilcabamba	
		Madidi	
		Noel Kempff Mercado	
		Iguazu-Mbaracayu	
		Zona Reservada del Aporimac	
		Cordillera da Sira	
4. Coastal Venezuela Montane Forests	Venezuela	Cordillera de la costa	
5. Greater Antillean Moist Forests	Cuba/Haiti/Puerto Rico/Jamaica/ Dominican Rep.	Sierra Madre	
6. Choco Darien Moist Forests	Colombia/Panama/Ecuador	Utria	Choco/Darien region (expand.)
		Sanquianga	
		Gorgona Island	
		Coto-Cayapas	
		Tumbes region	
7. Varzea Flooded Forests	Peru/Brazil/Venezuela	Nukak	
		Cahuinari	
		Puinawai	
		Anavilhanas	

Global 200 Ecoregion	Countries involved	Sites identified	Potential Groupings
8. Talamancan and Isthmian Pacific Forests	Costa Rica/Panama	Chimalapas and Ocote	
		Calakmul	Tikal to Mayan expand.
		Montes Azules	
		Chinantla	Transition zone in Oaxaca
		Guanacaste	
9. Napo Moist Forests	Ecuador/Colombia/Peru		
10. Rio Negro Juruea Moist Forests	Colombia/Brazil/Peru/Venezuela	Jau	
		Mamiraua	
		Lago Piratuba	
		Zona Reservada do Gueppi Pastaza Moronz	
11. S.W. Amazonian Moist Forests S.E. Amazonian Moist Forest	Peru/Brazil/Bolivia	Xingu	
		Serra do Divisor	
		Pacans-Novos	
12. Guayanan Forests Tepui formatus	Guyana/French Guyana/Venezuela/ Suriname/Brazil	Tepui Neblina	
		Guyanne Française	
		Kayateur Falls	
		Central Suriname	
		Kanaku Mountains	
		Caura River Watershed	
		Chiribiquele	
13. Madagascar Moist Forests	Madagascar		
14. Guinean Moist Forests	Guinea/Liberia/Togo/Côte d'Ivoire/ Ghana/Sierra Leone		
15. Eastern Arc Montane Forests	Kenya/Tanzania	Usumbaras	cluster Eastern Arc Montane Forests
		Pare	
		Uzungwa	
		Ulugurus	
16. East African Coastal Forests	Tanzania/Somalia/Mozambique/ Kenya	Tana River	
		Pangani	
		Kilwa	
17. Albertine Rift Highland Forests	Rwanda/Uganda/Tanzania/Burundi/ D.R. Congo		
18. East African Highland Forests	Kenya/Uganda/Tanzania	Mount Elgon	
19. Seychelles and Mascarine Islands Forests	Seychelles/Comoros/Reunion/ Rodrigues/Mauritius	Gran Comoro	
20. Gulf of Guinea Islands Forests	Sao Tome/Principe/Equatorial Guinea		
21. Macaronesian Forests	Azores/Madeira/Canary/Cape Verde		
22. Congolian Coastal Forests	Cameroon/Gabon/Congo/Nigeria/ Eq. Guinea/Benin		
23. Western Congo Basin Forests	D.R. Congo/Gabon/Cameroon/ C.A.F./Uganda	Lac Lobeke-Nki Boumba-Bek	cluster Western Congo Basin Forests
		Minhebe	
		Ndoke	

Annex 3:
Forest Protected Areas Warranting Further Consideration as Potential WH Forest Sites: Summaries from Various and Thematic Regional Analyses

Global 200 Ecoregion	Countries involved	Sites identified	Potential Groupings
24. Northeastern Congo Basin Forests	D.R. Congo/Sudan/C.A.F./Uganda		
25. Southern Congo Basin Forests	D.R. Congo/Angola		
26. Annamite Range Moist Forests	Laos/Thailand/Vietnam	Phong Nha	cluster Annamite Range Moist Forests
		Vu Quang	
		Pu Mat	
		Hin Namnu	
27. Western Ghats Moist Forests	India	Silent valley	cluster Western Ghats Moist Forests
		Karimpuzha	
		Nilgiri Thar	
		Agastyamalai	
		Periyar	
		Wynad	
		Mudhumalai Nagarahole	
		Biligiri	
		Rangaswamy hills	
		Mudantanthurai	
		Bandipur	
28. Sri Lankan Moist Forests	Sri Lanka	Adam's peak	
		Horton Plains	
		Hakgala S.N.R.	
29. Kaya-Karen Tenasserim Moist Forests	Thailand/Myanmar/Malaysia	Myinmo Melatkat	
		Andaman Coast	cluster Andaman Coast
30. Peninsular Malaysian Lowland Forests	Malaysia/Thailand	Halebala	Malaysia-Thailand transborder park
		Belum	
		Krau	cluster Taman Negara
		Khao Sok	
		Khong Lan	
31. Sumatra-Nicobar Islands Lowland Forests **32. Sumatran Montane Forests**	India/Indonesia	Leuser ecosystem	cluster Berbak
		Kerinci Seblat	
		Bukit Barisan Selatan	
33. Central Borneo Montane Forests	Indonesia/Brunei/Malaysia	Sebuku Sembakung	cluster Central Borneo Montane Forests
		Kayan Mentarang	
		Bentuang Karimun	
		Lanjak Entimau	
		Batang Ai	
		Pulong Tau	
34. Northern Borneo Palawan Moist Forests	Malaysia/Brunei/Indonesia/ Philippines	Gunung Kinabalu	
		Gunung Mulu	
		Lobi	
		St Paul	
		Serawak-Kalimantan	
		Palawan	
35. Philippines Moist Forests	Philippines	Cordillera Range	cluster Philippines Moist Forest
		Mount Giting-giting	cluster Palanan
		Mount Kitanglad	
36. Sulawesi Moist Forests	Indonesia	Dumoga	cluster Sulawesi Moist Forests
		Lore Lindu	
37. Moluccas Moist Forests	Indonesia		

Global 200 Ecoregion	Countries involved	Sites identified	Potential Groupings
38. North Indochina Sub-tropical Moist Forests	Thailand/China/Vietnam/Myanmar/ Laos		
39. Southeast Chian Subtropical Forests	China		
40. Northeastern India and Myanmar Hill Forests	India/Myanmar/Bangladesh	Manas	
41. Andaman Islands Forests	India		
42. Taiwan Montane Forests	Taiwan		
43. Hainan Island Forests	China		
44. Nansei Shoto Archipelago Forests	Japan		
45. New Caledonia Moist Forests	New Caledonia/France		
46. New Zealand Tropical Forests	New Zealand		
47. Queensland Tropical Forests	Australia	Cape York Peninsula	
48. New Guinea Montane Forests	Papua New Guinea/Indonesia	Hunstein Range alpha New Guinea	
		Lorentz	
49. New Guinea Lowland Forests	Papua New Guinea/Indonesia		
50. New Guinea Outer Island Solomon Moist Forests	Papua New Guinea/Solomon Islands		Solomon Islands cluster
51. Lord Howe and Norfolk Islands Forests	Australia		
52. Hawaii Moist Forests	United States		cluster in Hawaii
53. South Pacific Islands Forests	Fiji/Samoa/American Samoa	Kikori Lake	
	Fiji/Samoa/American Samoa	Kutubu alpha New Guinea	
54. Bolivian Lowland Dry Forests	Bolivia/Brazil		
55. Tumbes and North Inter Andean Valleys Dry Forests	Ecuador/Peru/Colombia		
56. Southern Mexican Dry Forests	Mexico		Dry forest in W. Mexico
57. Madagascar Dry Forests	Madagascar		cluster to be determined
58. Maputaland Pondoland Dry Forests	Mozambique/South Africa/ Swaziland	Great St Lucia Wetland Park	
59. Eastern Indochina Dry and Monsoon Forests	Vietnam/Laos/Cambodia/Thailand		
60. Lesser Sundas Dry and Monsoon Forests	Indonesia		
61. Eastern Indian Monsoon Forests	India		
62. New Caledonia Dry Forests	New Caledonia/France		
63. Hawaii Dry Forests	United States		Hawaii cluster

D. St. Petersburg Expert Meeting on Boreal Forests (UNESCO, 2003) – Boreal forest sites warranting consideration for inscription to the World Heritage List.

Potential new sites for nomination			
Country	**Name**	**Description**	**Criteria**
Canada	Atikaki-Woodland Caribou / East Side	This site is remarkable because of the existence of diverse and significant boreal forest values including woodland caribou in an ecologically intact cultural landscape. It fills an important gap by representing the Canadian boreal shield ecozone. This site is also internationally significant because of the planned integration of traditional and western ecological knowledge and land management.	Ni,Nii,Niv Ciii,Cv CL iib
Finland	Green Belt of Fennoscandia	Due to the Gulf Current, the boreal forest exists at its northernmost limit in Fennoscandia. The pine forests in the boundary area between Norway, Finland and Russia are the northernmost pine forests in the world. As a result, this cluster includes relict-like climax forests, whereas elsewhere in the world boreal pine forests were established as a pioneer species of forest succession.	
Russia	Basegi Nature Reserve	The site features representative taiga landscapes of Middle Urals not disturbed by human activity.	Ni, Niv
	Magadansky Nature Reserve	The proposed site is representative of the forests of the Far East and features natural ecosystems which are unique for biodiversity conservation. The silver salmon spawning grounds in the Chelomdzha River are probably the most productive in the world. The vast area of the Taujskaya lowlands is the main regional water foul habitat. The bird nesting grounds of Yamsky islands are the largest in Northern Pacific region.	Ni, Niv
	Malaya Sos'va Reserve	The Reserve conserves typical natural complexes of middle taiga of Western Siberia, the main habitat of thretend native European beaver population and many threatened prey bird species.	Niv, Nii
	Pinezhsky Reserve	This is the first Russian site featuring unique karst formations with an outstanding psysical-geography and aesthetic value.	Ni, Niii, Niv
	The Putorana Plateau Natural Complex.	This is the first Russian site located completely beyond the polar circle and featuring mountainous north-taiga and tundra natural complexes, the largest Siberian basalt formations and habitat of the endemic species the Putorana bighorn sheep.	Ni, Niii, Niv
	The Western Sayan	The territory of the reserve is of exceptional and universal value in terms of conservation of biodiversity. It presents a large amount of endemic, relict, as well as rare plant and animal species.	Niv, Nii, Niii
	Tsentralno-Sibirsky State Nature Reserve	The sites represents undamaged natural complexes of the taiga of central Siberia and central part of the continent.	Niv, Nii Ciii
	The Tungussky phenomenon	The Tungussky Reserve has the aim to conserve the area of the «Tungussky meteorite» and allows for the study of the ecological consequences of the meteorite impact.	Ni, Nii, Niv
	Valdai – the Great Watershed	The site features perfectly maintained south-taiga complexes which have an outstanding significance as a kind of biodiversity refugium of the Russian plain. This is the first Russian site nominated as the mixed natural and cultural site. The cultural landscape of the Great Watershed is representative of the traditional way of living of the Russian village.	Ni, Niv, Cv
	Kuril Islands	This site represents the natural complexes of the typical oceanic islands with their own unique features. The area provides protection of numerous rare, endangered and endemic species of plants and animals as well as unique ecosystems and natural phenomena.	Ni, Nii, Niii, Niv

Potential expansions of existing sites			
Country	**Name**	**Description**	**Criteria**
Canada	Wood buffalo	The expansion of the current world heritage site with adjacent protection would increase the site's ecological integrity and representativity.	Nii,Niv Ciii, Cv CL iib
	Nahani	The expansion of the current world heritage site to the boundaries of the watershed and beyond would help ensure the integrity of this globally significant ecosystem and add significant karst topography.	Nii, Nii, Niv, Ciii, Cv, CL ii
Finland	The Northern Kvarken	The Northern Kvarken has outstanding universal value for the understanding of how glaciation and deglaciation processes form a landscape. The Northern Kvarken is the most representative area in the world for studying moraine archipelagos and the land uplift phenomena (isostatic rebound).	
Norway	North Norwegian Fjord Landscape	Together with the adjacent Lapponian WH area in Sweden, the North Norwegian Fjord Landscape will provide a cross-section over the Scandinavia peninsula with unique geological characteristics. The Fjord Landscape also contain a virtually untouched Lule Sami cultural landscape within this large, intact boreal ecosystem.	
Russia	The river Bikin valley (for extension of "Central Sikhote-Alin" WH Site)	The territory of the Bikin River valley represent an unique natural complex with "Central Sikhote-Alin" WH Site and can be proposed as an extension of this Site. The largest integral massif of natural cedar-broad-leafed forests have been preserved in the valley. The territory of the Bikin valley serves as a reproductive center of the Northeast group of the Amur tiger.	Nii, Niv Ciii

Sites waranting further evaluation			
Country	**Name**	**Description**	**Criteria**
Canada	Muskwa-Kechika	Muskwa Kechika: This site reflects a visionary approach to conservation and integrated resource management of an intact boreal cordillera ecosystem.	
	Hudson Bay	This site is characterized by internationally significant isostatic rebounding and universally significant biodiversity including denning polar bears, exceptional migratory flocks, extensive peatlands and, offshore, listed beluga whales. A recent discovery of internationally significant fossils is worth noting.	
	Lake Superior	(combined with Wabikimi - Nipigon) A potential site including a continuous chain of several hundred kilometers of protected boreal forests, significant boreal lakes and a proposed marine protected area.	
	Wabikimi	(combined with Lake Superior) A potential site including a continuous chain of several hundred kilometers of protected boreal forests, significant boreal lakes and a proposed marine protected areas.	
	Mealy Mountains	Mealy Mountains: This site is most notable for the diversity of landforms ranging from mountain habitat, boreal forest, string bog, and coastal habitats including a significant dune complex.	
	Thelon Wildlife Sanctuary and Queen Maud Migratory Bird Sanctuary	This sites has outstanding geological features including extensive esker system and world's largest drumlin field; it has a huge abundance and diversity of migratory waterfowl and shorebirds, the richest area in the Arctic for mammals (musk ox, caribou, wolf), as well as a marine component of the Queen Maud Migratory Bird Sanctuary	Nii, Niv Ciii, Cv CL iib
	Canada / US transboundary site: Ivvavik and Vuntut National Parks (Yukon) and Arctic National Wildlife Refuge (Alaska)	Scenic beauty and natural phenomenon with mountains, wetlands, wild rivers and migrating wildlife spectacles; Geological processes relating to Pleistocene events and Beringia; Diversity and species with wide range of species especially caribou, bear,waterfowl and marine life.	Ni, Nii, Niv

annex 4

World Heritage Forest Programme performance indicators for the 30th session of the World Heritage Committee

The World Heritage Forest Programme was approved by the World Heritage Committee in its 25th session held in Helsinki, Finland. It is circumscribed by the draft "Natural World Heritage Strategy" and as such, is subjected to that strategy's guidance. An initial $100,000 budget was approved for the 2002-2003. An additional $20,000 were approved for the 2006-2007 biennium. During this period, an extrabudgetary project portfolio of over US$23M focusing on 21 World Heritage Forest properties has been managed by the World Heritage Centre natural heritage team.

The World Heritage Forest Programme performance indicator framework is based on input obtained predominantly from:

i) an international forest conservation experts meeting, held at Nancy (France) in March 2005;
ii) lessons learned from the implementation of 1998 Berastagi (Indonesia) World Heritage Forest meeting recommendations;
iii) the Convention on Biological Diversity's Programme of Work on Protected Areas and its ecosystem approach;
iv) lessons learned while implementing several large extrabudgetary projects within many World Heritage forest properties;
v) the 2004 IUCN study: *The World Heritage List: Future priorities for a credible and complete list of natural and mixed sites*.

Benchmarks are relatively modest, reflecting the limited resources available to focus specifically on carrying out the World Heritage Forest programme.

Vision and Mission of the Forest Programme

The Twenty-Year Vision: World Heritage Forests are models of forest protected area conservation at the national and international levels. They are integrated into landscape level decision-making processes and form the nucleus around which sustainable livelihoods are practiced.

The Mission: To promote the fullest and broadest application of the World Heritage Convention by all relevant stakeholders, from site level individuals to global organizations, in the pursuit of long term conservation of World Heritage forests and sustainable development.

Objective 1: Assemble and disseminate information and knowledge related to World Heritage Forests and the role of the World Heritage Convention in their conservation.

Outputs:
- Publications, workshops, presentations and other knowledge exchange mechanisms are implemented.
- World Heritage Forest programme website contains pertinent information of value to forest protected area stakeholders worldwide.

Outcomes:
- There is a better understanding of the comparative advantages of the World Heritage Convention amongst conservation stakeholders worldwide.
- The World Heritage Convention is leveraged by conservation stakeholders to promote forest conservation objectives.
- The World Heritage Convention's reputation as a standard setting instrument for the effective management of forest protected areas is enhanced.

Performance indicators:
- Number of information and knowledge dissemination events
- Number of major international conservation NGOs participating at World Heritage Committee meetings.
- Pertinence of the World Heritage Forest Programme page of World Heritage Centre website

Benchmarks:
- 2 information / knowledge dissemination events are carried out per biennium (e.g. publication, workshop, presentation at international conferences).
- At least 2 major international conservation NGOs participating at World Heritage Committee meetings in 2007 and 2008.
- Number of monthly visits to the World Heritage Forest Programme section of the World Heritage Centre website grows from 80 per month (January - April 2006) to 240 per month (January - April 2008).

Objective 2: Support the integration of World Heritage properties into the broader landscape with which they are ecologically connected.

Outputs:
- Existing and future World Heritage Centre inititiatives focusing on World Heritage Forest properties include a landscape level component focusing on the interaction between ecological processes inside and outside of the property.

Outcomes:
- The long term ecological integrity of World Heritage Forest properties is enhanced.

Performance indicators:
- World Heritage Forest site managers participating in landscape level decision-making processes.
- Landscape level initiatiatives incorporate World Heritage Forest site interests.

Benchmarks
- At least 4 World Heritage Forest property managers are formally involved in landscape level decision-making processes by World Heritage COM 32.
- At least two World Heritage Forest sites have enhanced their involvement with a corresponding UNESCO Biosphere Reserve by WH COM 32.

Objective 3: Seek out and take advantage of opportunities to channel technical and financial support to World Heritage Forests in an effort to enhance management capabilities and in dealing with priority management actions.

Outputs:
- Extrabudgetary projects in World Heritage Forest sites are being developed and coordinated by the World Heritage Centre.
- Partner conservation organizations are coordinating their conservation investments in and around World Heritage Forest sites with input from the World Heritage Centre.
- There is enhanced cooperation between UNESCO World Heritage Centre and the UNESCO Man and the Biosphere Programme.

Outcomes:
- Resources available for conservation of World Heritage Forest sites are used effectively and priority issues are being addressed.
- Effective implementation of UNESCO programmes and conventions in regards to sustainable forestry and forest conservation.

Performance indicators
- World Heritage Centre involvement in extrabudgetary projects focusing on World Heritage.
- Cooperation between World Heritage Centre and MAB Programme

Benchmarks
- World Heritage Centre participating in at least 5 extrabudgetary projects focusing on World Heritage Forests by WH COM 32
- World Heritage Centre and MAB Programme cooperating on at least 2 initiatives relating to sustainable forestry and forest conservation by WH COM 32

annex 5

Previous World Heritage Forest Meetings – Concluding Statements and Recommendations

A. 1998 BERASTAGI MEETING ON TROPICAL FOREST BIODIVERSITY AND THE WORLD HERITAGE CONVENTION

Concluding Statement

From 7 to 11 December 1998, 72 forest and biodiversity experts from 20 countries met in Berastagi, North Sumatra, Indonesia, to discuss the World Heritage Convention as an instrument
conserving the biodiversity of tropical forests. The meeting arrived at the following conclusions:

The World Heritage Convention, with its unique position within the framework of international conservation agreements, has a key role to play in conserving our planet's natural heritage, including the large proportion of global biodiversity (perhaps 70% of terrestrial biodiversity) that exists in the world's tropical forests. Already, 33 tropical Forest sites, covering more than 26 million hectares, are included on the World Heritage List.

Our vision is for a truly representative 'network' of tropical forests under World Heritage protection. We believe there is much potential to strengthen this network in line with the fundamental principles objectives of the Convention by supporting and assisting the work of the States Parties and the UNESCO World Heritage Centre.

This network of tropical forests should be expanded to include more sites of outstanding universal value from various regions. Of equal importance. the management of these sites should be improved and supported so that they might serve as models for 'best practice' in management of protected areas.

World Heritage sites help counter problems associated with overexploitation of tropical forests by acting as critical refuges for plants, animals - and as a source of inspiration for people, which may be vital in helping humanity adapt to an uncertain future. Safeguarding the rich variety of species and ecosystems in World Heritage tropical forests - ranging from that of Indonesia's Ujung Kulon National Park. home to one of the last remaining populations of the Javan rhino, to that of Manu National Park, which is thought to have the highest concentration of species anywhere on Earth - a top priority for international conservation efforts.

World Heritage sites should demonstrate how modern societies can manage areas to preserve universal biological values, thereby helping us to live in balance with the rest of nature.

These sites can serve as examples of how protected areas with high biodiversity can be conserved while still meeting the livelihood needs of indigenous people in the region. World Heritage tropical forest sites also provide critical ecological services, including water catchment protection, nutrient recycling: and carbon sequestration.

To fully achieve its objectives and potential, the World Heritage Convention requires much greater support from civil society at all levels. Therefore, we, the participants at the Berastagi meeting, pledge to promote such support from our respective institutions. Further, there is an urgent need to expand the capacity of the World Heritage Centre and IUCN (in its role as Technical Advisor on natural sites to the Convention) as well as State Parties. Such improvement will help to strengthen the management of existing tropical forest sites and to broaden the nomination of new sites in under-represented regions that have some of the world's most biologically rich tropical forests. This commitment requires both significantly increased funding from a range of sources and the development of mechanisms for long-term support of this proposed network of sites. We urge Governments, funding agencies and others to strengthen their support for existing and potential World Heritage tropical forest sites and to adopt additional funding mechanisms.

Policies on trade, forestry, agriculture. water resources, transport, tourism, and development, among others, define the framework within which the World Heritage Convention must work. Therefore, we call on Governments, the private sector, and all levels of civil society to ensure that the above policies do not adversely affect tropical forests that are on the World Heritage list or that have the characteristics needed to be considered for future listing.

Participants at the meeting noted with concern that some existing World Heritage sites are highly threatened by large-scale developments. We urge Governments to ensure the integrity of existing
World Heritage sites by working cooperatively to reduce negative impacts and to maintain the sites' World Heritage values.

The cultural and natural components of the Convention can potentially work more effectively together, especially in relation to tropical forests that have both outstanding concentrations of biodiversity and rich traditional human cultures, many of which are similarly threatened. We urge Governments, civil society, and the private sector to recognize the value of conserving outstanding examples of harmonious and sustainable human-forest relationships.

.../...

Recommendations to the World Heritage Committee

Over the past 25 years, the World Heritage Convention has played a key role in the conservation of tropical forest biodiversity. The World Heritage List currently includes 33 tropical forest sites totaling 26 million hectares of the

world's most outstanding forests. These sites are examples of how the World Heritage Convention supports protected areas and complements sustainable forest management programs while maintaining forests values.

The World Heritage Convention can make a major contribution to meeting State Parties' international obligations for forest biodiversity conservation, including those under the Convention on Biological Diversity and others emerging through the UNCSD Intergovernmental Forum on Forests.

On 7-11 December 1998, 72 experts from 20 different countries convened in Berastagi, North Sumatra. Indonesia, for a policy dialogue on World Heritage tropical forest. The group developed the following six sets of recommendations to be considered by the World Heritage Committee:

1. Identification and Nomination of Sites

Notwithstanding the progress already made in inscribing the existing 33 tropical forest sites on the World Heritage List, the Berastagi participants concluded that a number of tropical forest areas with outstanding global biodiversity values are not yet inscribed on the World Heritage List.
International experts have made several attempts to identify the world's biodiversity-rich tropical forest sites of highest priority. Such attempts have come from World Resources Institute (WRI), World Wildlife Fund (WWF), Conservation International (CI), World Conservation Union (IUCN), the World Conservation Monitoring Centre (WCMC), and Birdlife International. The Berastagi discussions found a high degree of convergence between these lists, indicating an emerging consensus about what sites have outstanding universal value in relation to the conservation of biological diversity. Many of these sites may merit consideration for nomination to the World Heritage List under criteria ii and iv of the Operational Guidelines.

Participants at the Berastagi meeting reviewed the forest biodiversity priorities that emerged from these various studies and compiled a draft list of sites judged to be of potential World Heritage quality. It is proposed that this list be given further expert review in the regions and countries where the sites exist.

Comparing the existing tropical forest sites on the World Heritage List with a list of potential sites identified at Berastagi, the experts at the meeting concluded that there was a compelling case for expanding the number and range of tropical forest sites on the World Heritage List. However, participants also noted that the value of the World Heritage listing process is based largely on globally accepted standards of quality of sites. Therefore, extreme care must be taken in both assessing new nominations and monitoring existing sites, to ensure that the criteria of the World Heritage Convention continue to be rigorously adhered to.

It was further noted that rapidly expanding scientific capacity for biodiversity assessment could help produce more objective assessment of the biodiversity of sites, and thus aid the selection of sites for World Heritage listing.

The distribution, dimensions, design, and number of tropical forest sites and their relationship with other categories of protected areas vary from one region to another. To most effectively conserve natural heritage values, the best answer might be sites of differing sizes, clusters of sites, or sites linked by 'corridors' of natural habitat, depending on the situation. We call on the World Heritage Committee, in strong alliance with research institutions, forest and land-use experts, government agencies, and others, to prioritize the development of plans to effectively manage existing World Heritage tropical forest sites as well as sites with the potential to be added to the list.

Recommendations

Accordingly, the Berastagi policy dialogue recommends that the World Heritage Committee:

1. Notes the new tentative list of tropical forest sites offered by the group.

2. Recognizes the urgent need for a special program for World Heritage tropical forest sites that ensures their conservation, especially their outstanding universal value for biodiversity.

3. Promotes the systematic identification, protection, and nomination of new World Heritage tropical forest sites, using the list developed at Berastagi as a guide to particular protected areas or bio-regions to be considered for nomination.

4. Utilizes the expertise and experience of the scientific community to facilitate the identification, assessment, and evaluation of sites for nomination to the World Heritage list.

5. Encourages Stare Parties to the Convention to consider nominating clusters of sites, where appropriate, to capture the full range of biodiversity in cases where forests are already fragmented. It was noted hat such forest clusters often include sites on different sides of international boundaries; therefore, State Parties are encouraged to collaborate and nominate trans-border sites.

2. Research, Assessment, and Monitoring

A sound assessment process is important in the identification and protection of the biodiversity and other recognized values of a World Heritage site. It provides a basis for determination of World Heritage values prior to nomination, for improved management decisions, and for monitoring and reporting.

Monitoring is an indispensable component of site management to ensure that management is effective in the conservation of the World Heritage values for which a site has been listed.

A research agenda for each World Heritage site should reflect the World Heritage values that merited the site's being inscribed. It should also be directed at guiding management responses needed to counter threats to World Heritage values. Relevant, problem-solving scientific research is one element necessary to ensure a high chance of success in long-term conservation of World Heritage values.

Recommendations

Accordingly, the Berastagi policy dialogue recommends that the World Heritage Committee:

1. Acknowledges the importance of biological assessment for both the selection of tentative sites that must merit consideration for World Heritage nomination and for management planning and decisions to conserve the 'outstanding universal values' that merited the listing.

2. Acknowledges the importance of having management objectives for each tropical forest site that are focused on their specific values that merited the site's inscription on the World Heritage list, and of conducting ongoing monitoring to ensure that management is effective in conserving those values.

3. Promotes the development of practical biodiversity monitoring tools, including the development of an Assessment and Monitoring Manual based on the best scientific principles, for use by site managers of World Heritage tropical forest sites.

4. Notes that effective monitoring need not be expensive, must be adapted to the local circumstances, and must be relevant to the needs of local site managers.

3. Tolerance of Human Use of World Heritage Tropical Forest Sites

World Heritage tropical forest sites, no matter how large and remote, are often under some form of threat for alternative use. The most serious threats to World Heritage tropical forest sites generally come from large-scale resource development and exploitation driven by corporations or government agencies. On-going major threats such as this require a concerted effort to strengthen government commitment and capacity to resist and regulate such threats, and particularly to improve spatial land-use planning of areas around World Heritage sites.

Many other human uses ore often occurring at the time of World Heritage listing. The scale of use is not necessarily an indicator of the impact on conservation values. All uses, therefore, need to be assessed for impact on World Heritage values. Ongoing monitoring is necessary to determine when uses are inconsistent with the protection of values for which a site was listed, so as to trigger regulation or remedial management when values are threatened.

More than 90,000 people reside within more than half of the World Heritage tropical forest sites. They frequently have rights - legal and traditional - that pre-date the inscription of the site on the World Heritage list or its prior establishment as a protected area.

In many cases, human interaction with the forest ecosystem has occurred for centuries for millennia while biodiversity value has been maintained. This should he recognized and be reflected in mining management practices.

Management of such World Heritage sites should not necessarily have as an objective the elimination of all human activities, but rather should be aimed at managing activities that pose the highest threat in ways that will ensure preservation of the values for which the site was listed. For this reason, great care must be taken in defining the values relevant to the World Heritage listing at the time of nomination.

Similar care is needed in understanding traditional indigenous uses and their impacts, past and present, on the status of the biodiversity of sites. As part of this process, new uses need to be distinguished from traditional uses. A precautionary approach would be to generally discourage or prohibit new uses unless compatibility with management objectives is readily demonstrable.

Recommendations

Accordingly, the Berastagi policy dialogue recommends that the World Heritage Committee:

1. Encourages State Parties, where people are included in a World Heritage tropical forest site, to recognize the need to carefully define the World Heritage values and management objectives prior to assessing the compatibility of uses; recognize the need to acknowledge and understand the traditional and other uses of the site before taking any action to eliminate such uses; and consider adoption of the principle of collaborative management between the site manager and the people living in or using the site as a proven model to resolve issues relating to traditional or pre-existing use rights.

2. Invites State Parties to identify successful examples of integrating use with management for biological diversity objectives as a "best practice" model for consideration by other site managers.

4. Financial and Other Support

A main threat to several World Heritage tropical forest sites is the lack of capacity and lack of funding for even basic conservation programs. Further, it is apparent that management agencies of globally important tropical forest sites that may merit consideration for World Heritage nomination lack the funding necessary to prepare nominations, meet the criteria for listing, and institute basic management programs.

International assistance to World Heritage sites has often taken the form of development projects aimed at fostering the livelihood of local communities that are consistent with the maintenance of conservation values. The rate of real success in such projects has been low, but much has been learned over the past decade of what will work in specific circumstances. A review of such development project experiences relevant to World Heritage would be a useful study.

Recommendations

Accordingly, the Berastagi policy dialogue recommends that the World Heritage Committee:

1. Notes the concern of the Berastagi meeting about the inadequacy of current funding and other assistance to adequately identify, plan, monitor, research, and manage tropical forests of 'outstanding universal value', regardless of whether or not they are already listed.

2. Recognizes the urgent need to actively promote increased funding and other assistance to facilitate the protection and conservation of tropical forests.

3. Recognizes the need to ensure that all funding and assistance should, as far as possible, strengthen or enhance existing management capacity and avoid creating new, inappropriate, or irrelevant demands on the time and resources of managers. In particular, there is an ongoing need to direct funding and other assistance to skills enhancement of local site managers through training and professional development.

4. Promotes better ,funding of World Heritage tropical forest sites through intergovernmental cooperation, trust funds, foundations, support groups, und the business sector.

5. Information

Information on World Heritage sites is an essential resource for managers. It is also vital in enabling the global community of concerned citizens to be aware of the values of these sites and the threats they face. Availability of information about these sites will strengthen the hand of governments and civil society in maintaining the values for which the site was inscribed on the World Heritage list.

Recommendations

Accordingly, the Berastagi policy dialogue recommends that the World Heritage Committee:

1. Acknowledges the importance of ready access to information to facilitate the identification, delineation, and management of tropical forest sites.

2. Strengthens existing information systems and promotes the development of appropriate new systems to serve the needs of the World Heritage forest sites and, in particular, considers a greatly enhanced World Heritage Center web site to facilitate rapid dissemination of information relevant to World Heritage; the establishment of networks of World Heritage experts, managers, scientists, and others to facilitate the flow of information and technology transfer and to aid problem solving; and supporting regional networks (many of which have been agreed upon in principle at World Heritage workshops) to gather, share, and disseminate information on World Heritage tropical forest sites.

These recommendations are hereby submitted to the World Heritage Committee to assist in the important and pressing task of protection of the outstanding universal heritage of biodiversity contained in the world's the tropical forests.

The participants in the Berastagi policy dialogue hereby commit themselves individually to promoting the recommendations of the meeting through their own actions.

B. THE 2003 ST. PETERSBURG MEETING ON BOREAL ZONE FOREST AND THE WORLD HERITAGE CONVENTION

Recommendations of the World Heritage Boreal Zone Workshop
St. Petersburg, Russia, 12 October 2003

With support from the World Heritage Centre, IUCN convened a workshop from 9 to 13 October 2003 in St. Petersburg, Russia, bringing together 33 governmental, NGO and academic experts from four boreal countries to discuss priorities in boreal forest conservation and to identify gaps within existing networks of protected areas as well as on the World Heritage List.

The workshop recognized that the boreal zone contains several features of outstanding universal value such as unique forest and wetlands ecosystems and species assemblages, habitats for rare and endangered species, the world's largest intact frontier forests, geologically and geomorphologically unique territories, and areas of

superlative natural beauty. The workshop also recognized another feature of outstanding value in the unique cultural heritage representing the diverse lifestyles of several indigenous peoples and ethnic sub-groups that have inhabited the boreal forest regions for thousands of years and maintain their traditional lifestyles. The boreal forests and associated wetlands are also globally important freshwater resources and carbon sinks for the world.

This heritage is currently under great threat of disappearing due to extensive industrial activities and climate change. The workshop emphasized the high urgency to take immediate measures to conserve the natural and cultural heritage contained in the boreal zone.

The workshop noted that within the boreal zone there still are large intact areas of frontier forests to be found. These are the last such large intact areas remaining on earth and therefore the countries with those areas, as well as the international community as a whole, have a great responsibility to protect them. The workshop also determined that the designation of additional sites of universal significance is required as a catalyst to foster international understanding of the global importance of the boreal zone.

Bearing the above in mind, the participants of the workshop endorsed the following recommendations.

To the World Heritage Committee, that it:

- Recognize the importance of conserving the outstanding manifestations of the boreal zone through all instruments available to the Committee, e.g. funding preparatory activities, encouraging further studies, supporting boreal zone nominations that fulfill World Heritage criteria, continuing support of the World Heritage Forest Programme.

- Consider exempting natural site nominations from the rule of one nomination per year per country, in the light of the high urgency of protecting the natural and cultural heritage identified in the boreal zone and due to the fact that most of this heritage is situated only in two vast countries.

- Endorse the framework developed at the workshop for considering the establishment of future World Heritage sites and protected areas in the boreal zone.

- Recognize the complex and unique interactions between indigenous cultures and boreal forests, and ensure support for nominations featuring the history, culture, traditions, and roles of indigenous peoples within the boreal zone.

To the States Parties with boreal forests, that they:

- As a matter of high urgency use all available means, including the World Heritage Convention, protect the intact frontier boreal forests and other areas of the boreal zone that are of high conservation value. Special attention is to be paid to preserving forest clusters in the zones of highest threat of fragmentation and disappearance, e.g. in Eurasia where remaining large clusters are found in Karelia and Arkhangelsk regions, and in Canada within the northern part of the commercial boreal forest region.

- Complete assessments of potential World Heritage sites, update their tentative lists accordingly, and consequently prepare and submit those nominations to the World Heritage Centre.

- Ensure involvement of indigenous and local communities in further efforts to identify and prioritize values to be represented on the World Heritage List.

- Facilitate national and international networks in support of sustainable management of existing and proposed World Heritage sites within the boreal zone, considering that there is a wealth of experience at the existing sites where lessons learnt from existing sites may be of use for preparing new nominations.

- Prioritize increasing the integrity of candidate World Heritage sites where these conditions are not currently met.

- Recognize that although some of the areas that were identified in the workshop may not meet the World Heritage criteria, they still are of high conservation value and ought to be protected by using other national and international instruments such as Man and Biosphere or Ramsar designations.

To site managers, that they:

- Encourage information exchange between existing sites and sites preparing nominations, e.g. through twinning arrangements both nationally and internationally.

To IUCN, that it:

- Support the refinement of the framework established in the workshop and take necessary steps to finalize it. This should include assessment of potential boreal zone elements within the Icelandic, Scottish, Japanese, Mongolian, Chinese, and Kazakhstan territories. Continue to provide expertise for boreal forest conservation through its networks.

- Continue to use best available expertise to evaluate new nominations of boreal forests.

- Facilitate the process of international and national networking for information and experience sharing by supporting it financially and by all other available means, in order to achieve common approaches in identification, establishment and management of the existing and proposed World Heritage sites. Great care ought to be taken to include all relevant stakeholders in the networks.

- Give high priority for financial support for the conservation of still intact boreal forests in general, and the areas identified at the workshop and within the framework in particular.

annex 6

List of Participants References

Surname	First name	Organization	Provenance
Barborak	Jim	CSU / WCS	USA
Besseau	Peter	IMFN	Canada
Debonnet	Guy	UNESCO-WHC	Belgium
Diaw	Chimere	CIFOR	Cameroon
Dufour	Sylvain	FFI	Canada
Galloway	Glen	CATIE	USA
Gidda	Sarat Babu	CBD	India
Guapyassu	Maisa	Fundacao Boticario	Brazil
Hart	Terese	WCS	USA
Ishwaran	Natarajan	UNESCO-MAB	Sri Lanka
Katwal	RPS	Gov. India	India
Kennedy	Will	UNFIP	USA
Kufakwandi	Frank	ADB	Nigeria
Lacerda	Leonardo	WWF	Brazil
Laverdière	Michel	UNFF	Canada
Leclercq	Benedicte	UNESCO-WHC	France
Lino	Clayton	Gov. Brazil	Brazil
Lumbuenamo	Raymond	ERAIFT	DRC
Maldague	Michel	Professor	Belgium
Malla	Yam	RECOFT	Nepal
Mathur	Vinod	WII	India
Meyer	Nils	KfW	Germany
Morgan	Vuillermoz	Student, L'ENGREF	France
Nasi	Robert	CIFOR	France
Ngog Nje	Jean	ERAIFT	DRC
Patry	Marc	UNESCO-WHC	Canada
Plachter	Harald	IUCN	Germany
Prchalova	Marie	UNESCO-Russia	Poland
Rasoarimanana	Vololoniaina	Swiss Cooperation	Madagascar
Ripley	Steve	UNESCO-WHC	UK
Schenkel	Celso	UNESCO-Brazil	Brazil
Sheppard	David	IUCN	Australia
Singer	Benjamin	Ph.D. student	France
Stone	Chris	CI	USA
Suter	Jamison	FFI	USA
Teissier du Cros	Eric	IUFRO	France
Teresinha de Nunes Pinto	Gladys	Instituto Terra	Brazil
Teresao Bernardes	Aline	Instituto Terra	Brazil

References

Agrawal, A. 2001. 'State Formation in Community Spaces: Decentralization of Control over Forests in the Kumaon Himalaya, India'. *Journal of Asian Studies* 60(1): 9-41.

Aldrich, M., A. Belokurov, J. Bowling, N. Dudley, C. Elliott, L. Higgins-Zogib, J. Hurd, L. Lacerda, S. Mansourian, T. McShane, D. Pollard, J. Sayer, and K. Schuyt. 2004. *Integrating Forest Protection, Management, and Restoration at a Landscape Scale*. Gland, Switzerland: WWF International.

Asian International Rivers Centre. n.d. *Brahmaputra River Initial Resources Inventory*. Yunan University, China: Asian International Rivers Centre.

Bandyopadhyay, J., B. Mallik, M. Mandal, and S. Perveen. 2002. *Dams and Development: Report on a policy dialogue on Dams and Development*. Calcutta: Centre for Development and Environment Policy, Indian Institute of Management.

Barborak, J. 1998. 'Buffer Zone Management: Lessons for the Maya Forest'. In Primack, R.B., D.B. Bray, H.A. Galleta, and I. Ponciano (Eds.), *Timber, Tourists and Temples: Conservation and Development in the Maya Forests of Belize, Guatemala, and Mexico*. Washington, DC: Island Press.

Bhattacharyya, M. n.d. 'Introduction to Assam'. Assam Agricultural University, viewed 16 January 2005, http://www.aau.ac.in/assam/index.htm

Biswas, S.P., D. Baruah, and A. Hazarika. 2000. 'An Experimental Study of Soil Conservation Using Herbaceous Plants in Majuli Island, Assam, India'. *The Environmentalist 20 1, pp. 19-27*.

Biswas, S.P. and S. Boruah. 2002. 'Ecology of the River Dolphin (Platanista gangetica) in the Upper Brahmaputra'. *Hydrobiologia* 430 1, pp. 97-111.

Blair, H. 2002. 'Participation and Accountability at the Periphery: Democratic Local Governance in Six Countries'. *World Development* 28: 21-39.

Bonal, B.S. and S. Chowdhury. 2004. *Evaluation of the Barrier Effect of National Highway 37 on the Wildlife of Kaziranga National Park and Suggested Strategies and Planning for Providing Passage: Feasibility Report to the Ministry of Environment and Forests, Government of India*. New Delhi: Ministry of Environment and Forests.

Borrini-Feyerabend, G. and D. Buchan (Eds.). 1997. *Beyond Fences: Seeking Social Sustainability in Conservation*, Volumes I and II. Gland, Switzerland: IUCN.

Boruah, S. and S.P. Biswas. 2002. 'Ecohydrology and Fisheries of the Upper Brahmaputra Basin'. *The Environmentalist* 22 2, pp. 119-131.

Brocket, C.D. 1998. *Land, Power, and Poverty: Agrarian Transformation and Political Conflict in Central America*. Oxford: Westview Press.

Bryant, Dirk, Daniel Nielsen & Laura Tangley, 1997; *The Last Frontier Forests - Ecosystems and Economies on the Edge*, World Resources Institute, Washington, p.42

CARPE/CBFP. 2005. 'The Forests of the Congo Basin: A preliminary Assessment'. Available at http://carpe.umd.edu/products/PDF_Files/FOCB_AprelimAssess.pdf

Carrera, F. and C. Prins. 2002. 'Desarrollo de la política en concesiones forestales comunitarias en Petén, Guatemala: El aporte de la investigación y experiencia sistematizada del CATIE' ['Policy Development Regarding Community Forest Concessions in Petén, Guatemala: The Contributions of the Research and Systematic Experience of CATIE']. *Revista Forestal Centroamericana* 37: 33-40.

Carrera, F., D. Stoian, J.J. Campos, J. Morales, and G. Pinelo. In press. 'Forest Certification in Guatemala'. In: Cashore, B., F. Gale, E. Meidinger, and D. Newsom (Eds.), *Confronting Sustainability: Forest Certification in Developing and Transitioning Countries*. New Haven, CT: Yale School of Forestry and Environmental Studies Press.

CEMEC and CONAP. 2000. *Map of Forest Fires in the Department of Petén in 1998*. Guatemala: Centre for Monitoring and Evaluation of the National Council of Protected Areas (CEMEC/CONAP).

Choudhury, A. 2004. *Kaziranga: Wildlife in Assam*. New Delhi: Rupa & Co.

----------. 2002. 'Distribution and Conservation of the Gaur Bos gaurus in the Indian Subcontinent'. *Mammal Review*, 32 3, pp. 199-226.

CIFOR, 1999. World Heritage Forests. The World Heritage Convention as a mechanism for conserving tropical forest biodiversity. CIFOR Centre for International Forestry Research. Jakarta .

Clark, C. 2000. 'Land Tenure De-Legitimization and Social Mobility in Tropical Petén, Guatemala'. *Human Organization* 59: 419-427.

Clark, B. and P. Duncan. 1992. 'Asian Wild Asses - Hemiones and Kiangs'. In *Zebra, Asses, and Horses: An Action Plan for the Conservation of Wild Equids*. Gland, Switzerland: IUCN.

COMIFAC (Conference of Ministers in Charge of Forests in Central Africa). 2005. *Plan de Convergence 2005* [2005 Convergence Plan].

CONAP. 2002. *Política marco de concesiones para el manejo integral de recurso naturales en Áreas Protegidas de Petén* [Policy Guidelines for Concessions for the Integral Management of Natural Resources in the Protected Areas of Petén]. Guatemala: CONAP.

Coopers & Lybrand. 1996. Assam: A Guide for Investors'. North Eastern Development Finance Corporation, Ltd., Guwahati, Assam. Accessed on 16 January 2005, http://databank.nedfi.com/content.php?menu=114&page_id=82

Dhar, O.N. and S.S. Nandargi. 1998. 'Floods in Indian Rivers and Their Meteorological Aspects'. In Kale, V.S. (Ed.) *Flood Studies in India*, Vol. 41, pp. 1-25. Bangalore: Geological Society of India.

Dudley, N., M. Hockings, and S. Stolton. 2003. 'Protection Assured: Guaranteeing the Effective Management of the World's Protected Areas. A Review of Options'. Background Paper for the World Commission on Protected Areas. Gland, Switzerland: IUCN.

Dudley, N. and Phillips, A. 2005. Forests and Protected Areas: Guidance on the use of the IUCN protected area management categories. IUCN, Gland, Switzerland.

ENVIS. 2002. *Environmental Problems in Tea Gardens*. ENVIS Newsletter. Guwahati, Assam, India: Institute of Advanced Study in Science and Technology.

FAO, 1998. Global forest products consumption, production, trade and prices: global forest products model projections to 2010. Working Paper No: GFPOS/WP/01, FAO, Rome.

FAO, 2001. Global Forest Resources Assessment 2000: main report. FAO Forestry Paper No. 140. Rome.

FAO, 2003. State of the World's Forests 2003. FAO Rome.

FAO, 2005A; Forest Resource Assessment 2005, Food and Agriculture Organization of the United Nations, Rome, http://www.fao.org/forestry/foris/webview/forestry2/index.jsp?siteId=101&sitetre eld=16807&langId=1&geold=0

FAO, 2005B. State of the World's Forests 2005. FAO Rome.

Ferroukhi, L., A. Aguilar, and E. Wo Ching. 2001. '*Gestión local de los recursos naturales: Papel del MINAE y de las municipalidades*' ['Local Natural Resource Management: MINAE and Municipalities Paper']. San José, Costa Rica: CEDARENA, DECAFOR-SINAC/MINAE, FAO, and Forests, Trees and People.

Few, R. 2000. 'Conservation, Participation, and Power: Protected Area Planning in the Coastal Zone of Belize'. *Journal of Planning Education and Research* 19: 401-408.

FSC (Forest Stewardship Council). 2004. 'Forest Management Report by Continents up to August 2, 2004'. Website accessed on 7 October 2004.

Galloway, G. 2000. 'Operational Networking: An Effective Mechanism to Promote Tropical Forest Management. Promising Experiences in Central America'. Sub-Plenary Paper, XXI IUFRO World Congress, pp. 902-908. Kuala Lumpur: IUFRO.

Galloway, G., and J. Zamora. 2000. 'Estrategia de capacitación para la unidad de manejo de bosques naturales' ['Capacity-Building Strategy for the Management of Natural Forests']. Internal document. Turrialba, Costa Rica: CATIE.

Glick, D. 1998. 'The Impacts of Rural Growth on Western Wildlands: The Case of the Greater Yellowstone Ecosystem'. First Annual Conference on Environmental Protection and Growth Management in the West. Denver, CO: Rocky Mountain Land Use Institute, College of Law, University of Denver.

Glick, D. and B. Alexander. 2000. 'Development by Default, Not Design: Yellowstone National Park and the Greater Yellowstone Ecosystem'. In Machlis, G.E. and D.R. Field (Eds.), *National Parks and Rural Development: Practice and Policy in the United States*, pp: 181-207. Washington, DC: Island Press.

Government of Assam, Irrigation Department. 2003. 'Economic Survey: Assam', http://www.assamgov.org/ecosurvey/Irrigation.htm

Government of Assam. n.d. *Assam Vision 2025*. Government of Assam, accessed 16 January 2005, http://assamgovt.nic.in/asmvision.htm

Government of India, National Development Council. 2002. 10th *Five Year Plan (2002-2007)*. New Delhi: Government of India Planning Commission.

Hales, D. 1989. 'Changing Concepts of National Parks'. In Western, D. and M. Pearl (Eds.), *Conservation for the Twenty- First Century*, pp. 139-149. New York: Oxford University Press.

Hindu, The. 2003. 'China Evasive on Brahmaputra Power Plant'. *The Hindu*, 6 November 2003.

Hough, J.L. 1988. 'Obstacles to Effective Management of Conflicts between National Parks and Surrounding Human Communities in Developing Countries'. *Environmental Conservation* 15: 129-136.

Iremonger, S., C. Ravilious and T. Quinton (1997). A statistical analysis of global forest conservation. In: Iremonger, S., C. Ravilious and T. Quinton (Eds.) A global overview of forest conservation. Including: GIS files of forests and protected areas, version 2. CD-ROM. CIFOR and WCMC, Cambridge, U.K.

IUCN, 2004. The World Heritage List: Future priorities for a credible and complete list of natural and mixed sites. IUCN, Gland, Switzerland.

Jayaraman, K.S. 2003. 'India Pledges Deluge of Funds to Water Plan'. *Nature* 422, p. 790.

Kale, V.S. 2003. 'Geomorphic Effects of Monsoon Floods on Indian Rivers'. *Natural Hazards* 28, pp. 65–84.

Kale, V.S., A. Gupta, and A.K. Singhvi. 2004. 'Late Pleistocene-Holocene Palaeohydrology of Monsoon Asia'. *Journal of the Geological Society of India* 64 4, pp. 403-418.

Katti, M. and T. Price. 1996. 'Effects of Climate on Palearctic Warblers over Wintering in India'. *Journal of the Bombay Natural History Society* 93, pp. 411-427.

Knight, R.L. and P.B. Landres (Eds.). 1998. *Stewardship across Boundaries*. Washington, DC: Island Press.

Knight, R.L., G.N. Wallace, and W.E. Riebsame. 1995. 'Ranching the View: Subdivisions versus Agriculture'. *Conservation Biology* 9(2): 459-461.

Lybecker and Mumme, 2002. 'Decentralization and Environmental Protection on Mexico's Northern and Southern Boundaries'. *Journal of Environment and Development* 11(4): 402-429.

Manabe, S., P.C.D. Milly, and R. Wetherald. 2004. 'Simulated Long-Term Changes in River Discharge and Soil Moisture Due to Global Warming'. *Hydrological Sciences* 49 4, pp. 625-642.

Ministry of Water Resources. 2002. *National Water Policy*. New Delhi: Ministry of Water Resources.

Mirza, M.M.Q. 2003. 'Three Recent Extreme Floods in Bangladesh: A Hydro-Meteorological Analysis'. *Natural Hazards* 28 1, pp. 35–64.

Mirza, M.M.Q., R.A. Warrick, and N.J. Ericksen. 2003. 'The Implications of Climate Change on Floods of the Ganges, Brahmaputra, and Meghna Rivers in Bangladesh'. *Climatic Change*, 57 3, pp. 287-31.

Mirza, M.M.Q., R.A. Warrick, N.J. Ericksen, and G.J. Kenny. 2001. 'Are floods getting worse in the Ganges, Brahmaputra, and Meghna basins?' *Environmental Hazards* 3 2, pp. 37–48.

Mohapatra, P.K. and R.D. Singh. 2003. 'Flood Management in India'. *Natural Hazards* 28 1, pp. 131-143.

Mollinedo, P. del C. 2000. 'Social Benefits and Financial Profitability of Sustainable Forest Management in Two Communities of the Mayan Biosphere Reserve, Petén, Guatemala'. Unpublished M.Sc.Thesis. Turrialba, Costa Rica: CATIE.

Mumme, S. and E. Korzetz. 1997. 'Democratization, Politics, and Environmental Reform in Latin America'. In MacDonald et al. (Eds.), *Latin American Environmental Policy in International Perspective*, pp 40-57. Boulder, CO: Westview Press.

National Remote Sensing Agency. 1983. *Mapping of Forest Cover in India from Satellite Imagery 1972–75 and 1980–82: Summary Report*. North Eastern States/Union Territories. Hyderabad: NRSA, Government of India.

NEOLAND Technologies. 2003. *Report on Study on the Increasing Pattern of Uses of Fertilizers, Pesticides, and Other Chemicals in the Field of Agriculture in the Darrang, Barpeta, Nagaon, and Kamrup Districts of Assam*. Guwahati, Assam: NEOLAND Technologies.

Nepal, S.K. 1997. 'Sustainable Tourism, Protected Areas, and Livelihood Needs of Local Communities in Developing Countries'. *International Journal of Sustainable Development and World Ecology* 4: 123-135.

Oates, J.F. 1999. *Myth and Reality in the Rain Forest: How Conservation Strategies Are Failing in West Africa*. Berkeley: University of California Press.

----------. 1995. 'The Dangers of Conservation by Rural Development: A Case Study from the Forests of Nigeria'. *Oryx* 29: 115-122.

Paniagua Alfaro, F. and L. Villalobos Molina. 1996. *Manual de la ley sobre la zona marítimo terrestre: Guía ilustrada para su comprensión y aplicación* [Legal Manual on Terrestrial Maritime Zones: Illustrated Guide for Your Comprehension and Application]. San José, Costa Rica: CEDARENA.

Pathak, G. n.d. 'Celebrating Failures with Rhetoric'. In *The Assam Development Report*. Planning Commission and the Assam Government, in collaboration with the Mumbai-based Indira Gandhi Institute of Development Research. Mumbai: IGIDR.

Pedersen, A. 2002. *Managing Tourism at World Heritage Sites*. Paris: The World Heritage Centre, United Nations Educational, Scientific, and Cultural Organization.

Phillips, A. 2003. 'Turning Ideas on Their Head: The New Paradigm for Protected Areas'. *The George Wright Forum* 20(2): 8-32.

----------. 1998. 'Working Landscapes and Protected Areas: The Agenda for the 21st Century'. In Munro, N.W.P. and J.H.M. Willison (Eds.), *Linking Protected Areas with Working Landscapes Conserving Biodiversity*, pp. 3-17. Wolfville, Canada: SAMPAA.

Pullis La Rouche, Genevieve, 2003. Birding in the United States: A Demographic and Economic Analysis. Addendum to the 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation. United States Fish and Wildlife Service, Washington D.C. USA, http://library.fws.gov/nat_survey2001_birding.pdf

Platt, R.H. 1996. *Land Use and Society: Geography, Law, and Public Policy*. Washington DC: Island Press.

Rabinowitz, A. 1999. 'Nature's Last Bastion: Sustainable Use of Our Tropical Forests May Be Little More than Wishful Thinking'. *Natural History*, 108: 70-72.

Rajvanshi, A., V.B. Mathur, G.C. Teleki, and S.K. Mukherjee. 2001. *Roads, Sensitive Habitats, and Wildlife. Environmental Guidelines for India and South Asia*. Dehradun, India and Toronto: Wildlife Institute of India and Canadian Environmental Collaborative.

Reynolds, J.J. and C. Schonewald. 1998. 'Protected Areas, Science, and the 21st Century'. In Munro, N.W.P. and J.H.M. Willison (Eds.), *Linking Protected Areas with Working Landscapes Conserving Biodiversity*, pp. 18-23. Wolfville, Canada: SAMPAA.

Ribot, J.C. 1999. 'Decentralization, Participation, and Accountability in Sahelian Forestry: Legal Instruments of Political-Administrative Control'. *Africa* 69: 23-65.

Roper, J. and Roberts, R. 2006. Deforestation: Tropical Forests in Decline. CIDA Forestry Advisers Network. Canadian International Development Agency. http://www.rcfa-cfan.org/english/pdf/Deforestation%20-%20Tropical%20Forests%20in%20Decline.pdf

Santer, B.D., T.M.L. Wigley, T.P. Barnett, and E. Anyamba. 1996. 'Detection of Climate Change and Attribution of Causes'. In Houghton, J.T., L.G. Meira, D. Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskell (Eds.), *Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.

Schonewald-Cox, C. 1992. 'Environmental Auditing and Cross-Boundary Management between National Parks and Surrounding Lands: A Review and Discussion'. *Environmental Management* 16: 273-282.

----------. 1988. 'Boundaries in the Protection of Nature Reserves'. *BioScience* 38: 480-486.

Shackley, M.L. 2000. *Visitor Management: Case studies from World Heritage Sites*. Oxford: Butterworth-Heinemann.

Sherbinin, A.D. and Freudengerger, M. 1998. 'Migration to Protected Areas and Buffer Zones: Can We Stem the Tide?' *Parks* 8: 38-53.

Stonich, S. 1998. 'Political Ecology of Tourism'. *Annals of Tourism Research* 25: 25-54.

Sundberg, J. 2002. 'Conservation as a Site for Democratization in Latin America: Exploring the Contradictions in Guatemala'. *Canadian Journal of Latin American and Caribbean Studies* 27(53): 73-103.

Terborgh, J. 1999. *Requiem for Nature*. Washington, DC: Island Press/Shearwater Books.

Theobald, D.M. and N.T. Hobbs. 2002. 'A Framework for Evaluating Land Use Planning Alternatives: Protecting Biodiversity on Private Land'. *Conservation Ecology* 6(1): 5.

Thorsell, J. and Sigaty, T. 1997. A Global Overview of Forest Protected Areas on the World Heritage List. UNESCO World Heritage Centre, Paris.

Tosun, C. 2000. 'Limits to Community Participation in the Tourism Development Process in Developing Countries'. *Tourism Management* 21: 613-633.

Trousdale, W.J. 1999. 'Governance in Context: Boracay Island, Philippines'. *Annals of Tourism Research* 26: 840-867.

UNEP-WCMC, 2004. A Review of the World Heritage Network; Biogeography, Habitats and Biodiversity. UNEP-WCMC, Cambridge.

USDA Forest Service. 2001. *Memorandum of Understanding for Multi-Jurisdictional Cooperation and Collaboration Regarding Land Use Planning and Management: White River National Forest*. Glenwood Springs, CO: USDA.

UNESCO-IUCN. 2003. *Initial Management Effectiveness Evaluation Report of Kaziranga National Park*. 'Enhancing Our Heritage' Project Team. Dehradun, India: Assam Wildlife Institute of India.

United States Department of Commerce. 1928. *The Standard Planning Enabling Act. Statute 30-28-111*. Washington, DC: USDC.

Van Schaik, C.P. and R.A. Kramer. 1997. 'Toward a New Protection Paradigm'. In Kramer, R.A., C.P. van Schaik, and J. Johnson (Eds.), *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*, pp. 212-230. New York: Oxford University Press.

Vasu, N.K. 2003. *Management Plan of Kaziranga National Park (2003-2013)*. Assam: Forest Department.

Wallace, G.N. 2001. 'Building Bridges: A Boundary Analysis Exercise between Local Governments and the White River National Forest'. Paper presented at 'Crossing Boundaries in Park Management' and in the *Proceedings from the George Wright Society's Biennial Conference, Denver, April 10-14*.

Watson, Robert T., I.R. Noble, B. Bolin, N. H. Ravindranath, D. J. Verardo and D. J. Dokken (Eds.) Special Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, UK.

Wikramanayake, E.D., E. Dinerstein, J.G. Robinson, U. Karanth, A. Rabinowitz, D. Olson, T. Matthew, P. Hedao, M. Conner, G. Hemley, and D. Bolze. 1998. 'An Ecology-Based Method for Defining Priorities for Large Mammal Conservation: The Tiger as Case Study'. *Conservation Biology* 12 4, pp. 865-878.

Wilshusen, P.R., S.R. Brechin, C.L. Fortwangler, and P.C. West. 2002. 'Reinventing a Square Wheel: Critique of the Resurgent "Protection Paradigm" in International Biodiversity Conservation'. *Society and Natural Resources* 15:17-40.

Wolfensohn, J. 1999. 'Proposal for a Comprehensive Development Framework'. Draft posted on World Bank website, http://www.worldbank.org, accessed mid-2005.

Wood, A., P. Stedman-Edwards, and J. Mang (Eds.). 2000. *The Root Causes of Biodiversity Loss*. London: Earthscan Publications.

World Bank. 2005. 'Impact Assessment Report, Assam Agricultural Competitiveness Project'. Assam Rural Infrastructure and Agricultural Services Project Society, 2004; The World Bank India. Viewed 16 January 2005, http://www.worldbank.org.in/external/default/main?pagePK=64027221&_piPK=64027220&theSitePK=295584&menuPK=295615&Projectid=P084792

World Bank. 2004. 'India: World Bank Supports Agricultural Development in Assam'. Press Release of 14 December 2004, News Release No:2005/236/SAR. Accessed 16 January 2005, http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20294810~menuPK:34466~pagePK:64003015~piPK:64003012~theSitePK:4607,00.html

----------. 2003. 'Project Information Document (PID) Concept Stage'. Report No: AB192, accessed 16 January 2005, http://www.wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/03/02/000104615_20040302120200/Rendered/PDF/AACP0final0PID.pdf

Published within the World Heritage Papers Series

World Heritage manuals 1
Managing Tourism at World Heritage Sites: a Practical Manual for World Heritage Site Managers
Gestión del turismo en sitios del Patrimonio Mundial: Manual práctico para administradores de sitios del Patrimonio Mundial
(In English) November 2002; (In Spanish) May 2005

World Heritage papers 2
Investing in World Heritage: Past Achievements, Future Ambitions
(In English) December 2002

World Heritage reports 3
Periodic Report Africa
Rapport périodique pour l'Afrique
(In English and French) April 2003

World Heritage papers 4
Proceedings of the World Heritage Marine Biodiversity Workshop, Hanoi, Viet Nam
February 25–March 1, 2002
(In English) May 2003

World Heritage papers 5
Identification and Documentation of Modern Heritage
(In English with two papers in French) June 2003

World Heritage papers 6
World Heritage Cultural Landscapes 1992-2002
(In English) July 2004

World Heritage papers 7
Cultural Landscapes: the Challenges of Conservation
Proceedings from the Ferrara workshop, November 2002
(In English with conclusions and recommendations in French) August 2004

World Heritage papers 8
Mobilizing Young People for World Heritage
Proceedings from the Treviso workshop, November 2002
Mobiliser les jeunes pour le patrimoine mondial
Rapport de l'atelier de Trévise, novembre 2002
(In English and French) September 2003

World Heritage papers 9
Partnerships for World Heritage Cities - Culture as a Vector for Sustainable Urban Development
Proceedings from the Urbino workshop, November 2002
(In English and French) August 2004

World Heritage papers 10
Monitoring World Heritage
Proceedings from the Vicenza workshop, November 2002
(In English) September 2004

World Heritage reports 11
Periodic Report and Regional Programme - Arab States 2000-2003
Rapports périodiques et programme régional - Etats Arabes 2000-2003
(In English and French) June 2004

World Heritage reports 12
The State of World Heritage in the Asia-Pacific Region 2003
L'état du patrimoine mondial dans la région Asie-Pacifique 2003
(In English) October 2004; (In French) July 2005

World Heritage papers 13
Linking Universal and Local Values: Managing a Sustainable Future for World Heritage
L'union des valeurs universelles et locales : La gestion d'un avenir durable pour le patrimoine mondial
(In English with the introduction, four papers and the conclusions and recommendations in French) October 2004

World Heritage papers 14

Archéologie de la Caraïbe et Convention du patrimoine mondial
Caribbean Archaeology and World Heritage Convention
Arqueología del Caribe y Convención del Patrimonio Mundial
(In French, English and Spanish) July 2005

World Heritage papers 15

Caribbean Wooden Treasures
Proceedings of the Thematic Expert Meeting on Wooden Urban Heritage in the Caribbean Region
4–7 February 2003, Georgetown - Guyana
(In English) October 2005

World Heritage reports 16

World Heritage at the Vth IUCN World Parks Congress
Durban (South Africa), 8–17 September 2003
(In English) December 2005

World Heritage papers 17

Promouvoir et préserver le patrimoine congolais
Lier diversité biologique et culturelle
Promoting and Preserving Congolese Heritage
Linking biological and cultural diversity
(In French and English) December 2005

World Heritage papers 18

Periodic Report 2004 – Latin America and the Caribbean
Rapport périodique 2004 – Amérique Latine et les Caraïbes
Informe Periodico 2004 – América Latina y el Caribe
(In English, French and Spanish) March 2006

World Heritage papers 19

Fortificaciones Americanas y la Convención del Patrimonio Mundial
American Fortifications and the World Heritage Convention
(In Spanish with the foreword, editorial, programme, opening ceremony and seven papers in English)
December 2006

World Heritage reports 20

Periodic Report and Action Plan
Europe 2005-2006
(In English) January 2007

World Heritage reports

United Nations
Educational, Scientific and
Cultural Organization

For more information contact:
UNESCO World Heritage Centre

7, place de Fontenoy
75352 Paris 07 SP France
Tel : 33 (0)1 45 68 18 76
Fax : 33 (0)1 45 68 55 70
E-mail : wh-info@unesco.org
http://whc.unesco.org