

## What Value Added from World Heritage Forests (draft)

Marc Patry<sup>1</sup>

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### Why a Special World Heritage Focus on Forests?

Forest ecosystems hold the vast majority of the world's terrestrial species. Ironically, these same ecosystems are under the greatest chronic pressure from human activities. The most important threat 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 alone was 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<sup>2</sup> (table 1).

Forest timber product	World Consumption, 2002
Fuel wood	1,795,496,000 M <sup>3</sup>
Industrial roundwood	1,595,188,000 M <sup>3</sup>
Sawnwood	388,361,000 M <sup>3</sup>
Wood based panels	197,343,000 M <sup>3</sup>
Paper and paper board	324,224,000 t
Pulp for paper	185,364,000 t

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

There are clearly serious tensions between the very large and growing demand for timber products and the global community's explicit intention to conserve forest biodiversity. Furthermore, these tensions are compounded by additional demands placed on, and stresses affecting remaining forests – namely those arising from the

massive subsistence 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% of the earth's forest cover has been removed (e.g. 2.4 billion hectares – or about 2.5 times the surface area of Canada), most of which has occurred in the past 150 years (Bryant et al, 1997). The obliteration of world forests for agriculture, urban and infrastructure development, along with the massive degradation of remaining forests through the siphoning off of forest ecosystem components constitute the largest single human induced land use change and ecosystem modification at the global scale.

The global community is not unaware of this alarming trend, as can be attested by the establishment of a variety of mechanisms designed to ensure the conservation and sustainable use of forest ecosystems both within and outside protected areas (box 1).

Most of these initiatives are policy, programme or project oriented, and to succeed generally rely on the availability of goodwill amongst governmental authorities, and on adequate and sustainable financing to carry out their objectives. Among these, only the WH Convention offers a mechanism whereby the conservation of protected forests can be rigorously monitored by an intergovernmental committee to which governmental authorities are obliged to report. The WH Convention is also the only mechanism that wields the statutory power to request that appropriate conservation measures for the long term integrity of protected forests be

- 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

**Box 1.** Some international forest conservation and sustainable use mechanisms.

<sup>1</sup> World Heritage Forest Programme focal point, UNESCO World Heritage Centre

<sup>2</sup> The total volume of timber products consumed annually can fill a column 1km wide by 1km deep by 4 km high. Wood for burning and charcoal production alone accounts for nearly half of the total

implemented.

Given its distinct comparative advantages within the community of international forest conservation initiatives, and the vast expanses of forests currently encribed on the WH List (13% of all IUCN category I-VI 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 in-situ conservation of forest biodiversity. In recognition of this solemn responsibility to the global forest conservation community, the WH Committee in its 25<sup>th</sup> 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.

### **What are WH Forests?**

Reliably labeling 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 consists of 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 areas where forest cover becomes less dense, and as it becomes mixed with open grasslands, rocky mountain summits, ice fields, water bodies, or where vast expanses of burned 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 % of land which would be hidden from view by the forest canopy in aerial photography / remote sensing). Some will consider 15% forest cover as forests, while others will begin counting only when forest cover surpasses 50%. Still others will refer to the presence of functioning forest based ecosystems. In the end, the decision is subjective and must serve the purposes to which it was intended. For the purpose of this paper, and for the sake of consistency with previous discussions on WH forests, we are using a slightly modified version of the definition first developed by Thorsell and Sigaty (1997):

#### 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 OUV** (bold corresponds to modification of original Thorsell and Sigaty definition).*

Dudley and Phillips (2005) developed IUCN's definition – which would likely be 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 per cent.*” (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 have not 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 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 and indeed, there is debate within the World Heritage community over the inclusion of some 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 the limitation with which we must work.

Given the above, one could consider 91 WH sites as WH Forests following the 30<sup>th</sup> World Heritage Committee of July 2006 (see Annex 1 for a complete list). The total surface area of these 91 WH forest sites is well over 75,347,291 hectares (approximately 1.5 times the area of France, or equivalent to the area 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 this 8.8 million hectare site. By subtracting these most obvious and measurable non-forest components from those WH Forest sites which have them, we obtain a better measure of *total forest cover within WH Forest sites*<sup>3</sup>. This figure comes to just over 63.7 million hectares of forest cover that is protected within 91 WH Forest sites worldwide distributed in 50 countries throughout the four major biomes (tropical, subtropical, temperate and boreal). The figure accounts for approximately 1.8% of the global forest cover, and a very significant 13% of all IUCN category I-VI protected forests (see chapter on State of WH Forests for a description of how these figures were reached).



Fig. 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 eliminated all nesting possibilities, driving this bird to extinction. © Norman Arlott/Rare Bird Club.

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 for the purposes of this paper, it is likely that the combined forest cover could amount to a significant figure, possibly totalling up to several million hectares<sup>4</sup>. One can also consider the measurable presence of forest cover within many of the 50 “cultural landscapes” inscribed in the WH list (e.g. Hallstatt-Dachstein Salzkammergut Cultural Landscape in Austria). Thus, between non-forest natural WH sites, forest natural WH sites and cultural landscapes, the figure of at least 63.7 million hectares of forest cover enjoying at least some protection under the auspices of the WH Convention (even if not always directly contributing to a site's OUV) can be more robustly defended and likely considered conservative.

### **Distinct WH Forest Conservation Strategy**

It is only by being clear on what sets WH forests apart from other non-forest protected areas and WH sites can a WH forest-specific conservation

strategy for the WH Centre be clearly articulated. 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 lead to a second set of differences related to management issues.

<sup>3</sup> This figure would likely continue to include a smaller proportion of non-forest lands – however, the author assumes that FAO forest cover figures would include a similar proportion non-forest areas, as any global level forest cover assessments will likely do, thus allowing for a reasonable comparison between WH and FAO figures later in this article.

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

### **A. Ecological distinctions:**

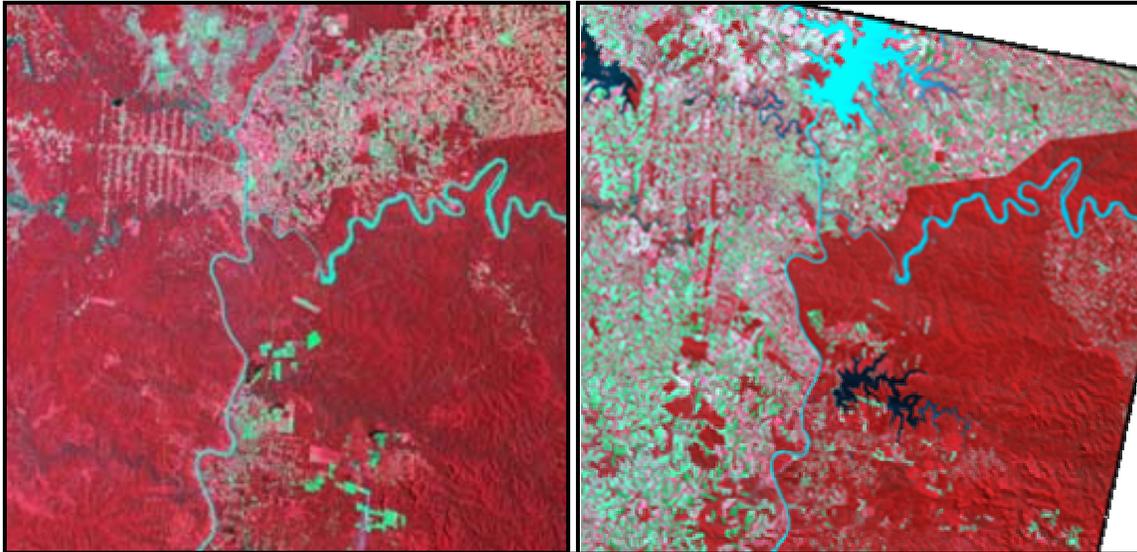
- i) **Biodiversity:** Forests usually contain higher biodiversity than other types of terrestrial ecosystems, particularly tropical and sub-tropical forests. They may contain up to two thirds of known terrestrial species.<sup>5</sup>
- ii) **Ecosystem services:** Forest ecosystems usually have elevated rates of evapotranspiration and are important stores of locked up carbon; these factors play important roles in local/global climate patterns. Forest ecosystems provide effective water retention and filtration services, also reducing soil erosion – services that provide valued benefits downstream and downhill. In many cases, forests serve as the breeding habitat for important subsistence species which migrate into the surrounding landscape where they can then 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<sup>6</sup>. These characteristics represent substantial and tangible services to humans, and to human communities both locally and globally, but are not usually effectively valued.
- iii) **Complexity:** Many forest species have evolved within the matrix of diverse natural forest habitats which result in 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, thus resulting in the loss of critical habitats, and the 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 specifically due to the destruction of its forest habitat, as large tracts of its original forest habitat remain in parts of Mexico, but rather by the removal of forest structures critical to its survival - selective logging within those forests have removed all the large old trees, critical for the bird's nesting cavities (see figure 1).

These first three points argue in favour of giving high priority to setting aside strict forest protected areas both for conserving the world's biodiversity, but also for contributing to the protection ecosystem services at local and global levels. However, these same characteristics are often the reasons leading to the proximate causes of the greatest threats to WH forest sites, which in turn lead to distinct management challenges for site managers. In particular:

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<sup>5</sup> 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.

<sup>6</sup> In 2001, birders in the USA alone spent US\$31 billion on goods and services to pursue their activities (Pullis La Rouche, 2003)



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

### **B. Management Challenge Distinctions:**

- iv) Quest for forest products: Forests contain many high value renewable resource species – 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, 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 establish commercial poaching activities targeting a wide range of species, and in many cases 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 are 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 i) depend on forest cover for migration, or ii) have collective home ranges that surpass the size of the protected lands. Ironically, increased ecological isolation is also considered among most ecologists to significantly increase the vulnerability of protected areas to climate change.

Given these distinguishing characteristics of protected forests, one can conclude that they 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. In this case, these challenges would include not only the potential threats from incursions into the protected forest by people seeking subsistence or commercial resources, or arable land (generally a greater challenge in developing country settings), but also the broader effects resulting from 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 the neighbouring land uses, population densities, 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.

### **WH 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 WH forest sites originating from decisions / actions taken at the landscape level (WH Sites where these threats exist)**

- 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, 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 of disease to, 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 NP, 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 are there established mechanisms in place to allow them to influence many decision-making processes. Though Environmental Impact Assessment process are becoming more common and can be used to ensure 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, resulting 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 it is most often used in a reactionary manner, once a threat has been detected. Though it has often proved effective in this manner, there would be a greater benefit should ways be found to use the Convention in a pro-active manner.

**Box 4: Case studies illustrating how the WH 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 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 decision to place the site on the WH in Danger list should the initial route be maintained.
3. Sangay National Park (Ecuador): A road construction through the southern portion of this site was taking place with little concern for environmental impact leading to the site's inscription on the list of WH in Danger. WH Committee insistence that the full environmental mitigation measures be implemented resulted in better road design and

- reduced impact on the site, eventually helping remove the site from the Danger list.
4. Cologne Cathedral (Germany): Proposals to build high rise tower 1 km from cathedral are shelved after the site is placed on the WH Danger list over concerns that its Outstanding Universal Values (OUV) will be compromised due to the loss of its pre-eminence in the cityscape.

## **WH Forest Programme Implications**

### **The Nancy Meeting – March 2005**

Recognizing the narrowing scope for future WH Forest inscriptions (see article in this publication “State of WH Forests”), and taking note of the threats particularly common to WH Forests, the WH Centre organized a three day meeting of international experts and stakeholders at France’s ENGREF (*Ecole National du Génie Rural des Eaux est des Forêts*) – the national forestry school in Nancy. The meeting was also planned as a follow-up on the successful Berastagi, Indonesia meeting organized by the WH Centre and hosted by CIFOR in Berastagi. Whereas the Berastagi meeting was particularly 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 CBD ecosystem approach could be applied. The group 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* (Annex 3), participants emphasized the need to have each site perceived in terms of linkages with its wider environment. They produced a series of recommendations focusing on using the WH Convention as a tool to encourage the consideration of landscape level interactions with WH forest sites during the nomination process.

Signatories to the Nancy Statement also noted the importance of developing and monitoring indicators of WH forest site integrity that included 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 the integrity of the site, and recommended that nomination forms include monitoring of elements within the broader landscape that could have an impact on the value and integrity of the site.

### **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 been busy. Over 74 million hectares of WH Forest sites representing 13% of all IUCN category I-IV protected forests worldwide, and 1.8% of all forest cover on the planet are currently protected within 91 WH forest sites in 50 countries. These figures do not consider the uncounted but significant expanses of forest enjoying some degree of protection under the WH Convention found in many of the remaining natural WH sites and in some cases cultural landscapes.

These facts alone convey upon the stewards of the World Heritage Convention an enormous responsibility to ensure that the Convention is used as effectively as possible so that maximum support to national governments is provided in their efforts to conserve this irreplaceable forest patrimony. Many other international efforts exist 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 their long term protection.

The Berastagi meeting in 1998 was a landmark event for 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.

Under these circumstances, it is now appropriate for the stewards of the WH Convention to concentrate their resources increasingly on helping WH forest management stakeholders develop mechanisms that will help them 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. Thus, the challenge ahead 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 potential harmful effects.

The participants at the Nancy meeting focused a large part of their discussions on this issue. The results of their work is presented in this publication in an effort to provide a direction to the evolving debate.