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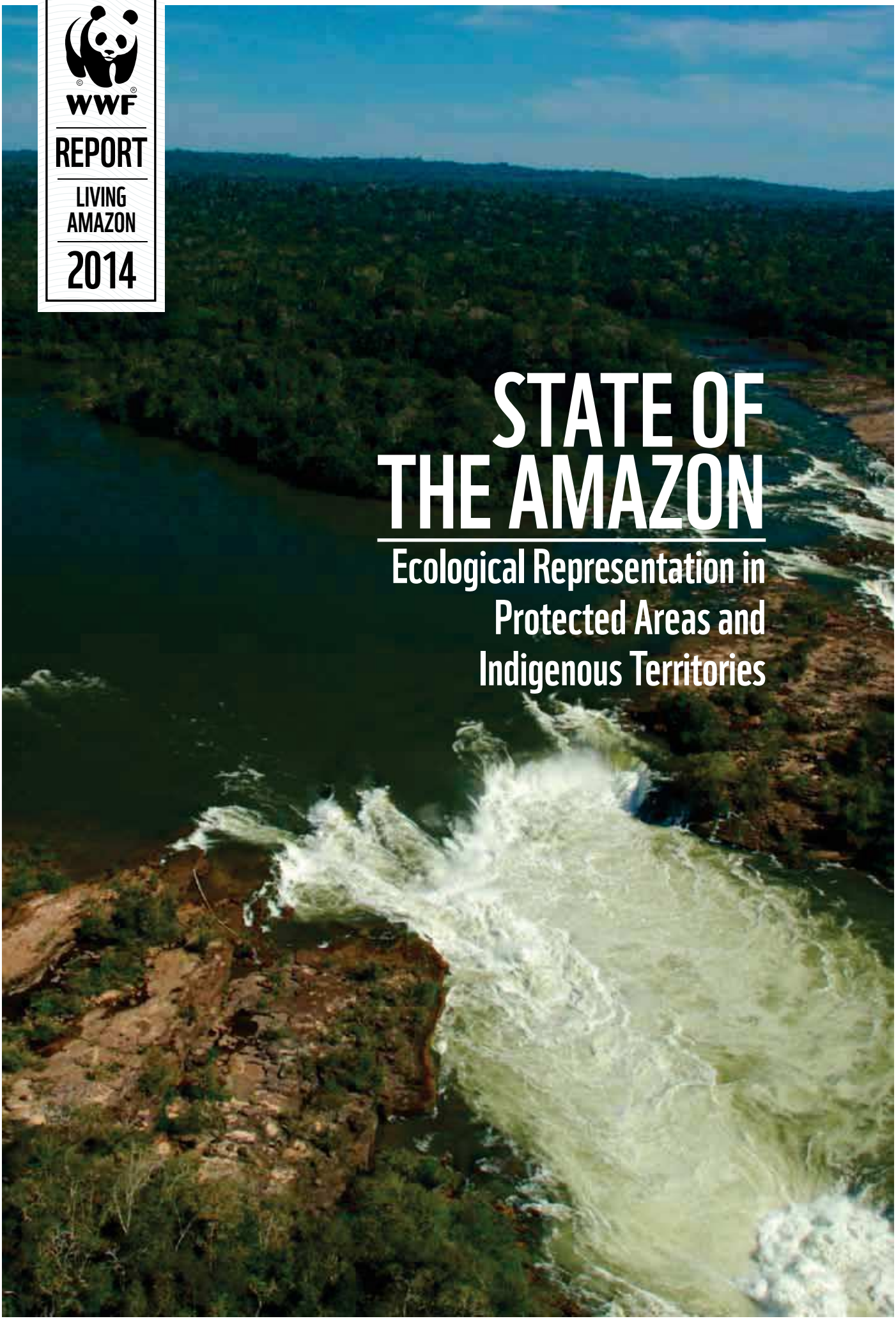
REPORT

LIVING AMAZON

2014



STATE OF THE AMAZON

Ecological Representation in Protected Areas and Indigenous Territories

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STATE OF THE AMAZON: Ecological Representation in Protected Areas and Indigenous Territories

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List of Acronyms

ACTO	Amazon Cooperation Treaty Organization
ANI	Amazon Network Initiative, former name for LAI
ARA	Amazon Regional Articulation, a network of Amazon NGOs
ARPA	Amazon Region Protected Areas programme,
CBD	Convention on Biological Diversity
CBD	Convention on Biological Diversity
CCA	Community Conserved Area
CI	Conservation International
COICA	Coordinator of Indigenous Organisations of the Amazon River Basin
COP	Conference of the Parties
GHG	Greenhouse gases
GIS	Geographic Information System
IBGE	Brazilian Institute of Geography and Statistics
ICV	Centre for Life Institute
IPs	Indigenous Peoples
ISA	Socio-Environmental Institute
ITs	Indigenous Territories
IUCN	International Union for the Conservation of Nature
LAI	Living Amazon Initiative, a WWF Network Global Initiative
MDG	Millennium Development Goals
NSPA	National Systems of Protected Areas
PADDD	PAs Downgrading, Downsizing and Degazettement
PAs	Protected Areas
PoWPA	Programme of Work on Protected Areas of the CBD
UNEP	United Nations Environmental Programme
WCMC	World Conservation Monitoring Centre, the specialist biodiversity assessment centre of UNEP
WCPA	World Commission on Protected Areas, of IUCN
WDPA	World Database on Protected Areas, a joint product of UNEP and IUCN
WWF	World Wide Fund for Nature

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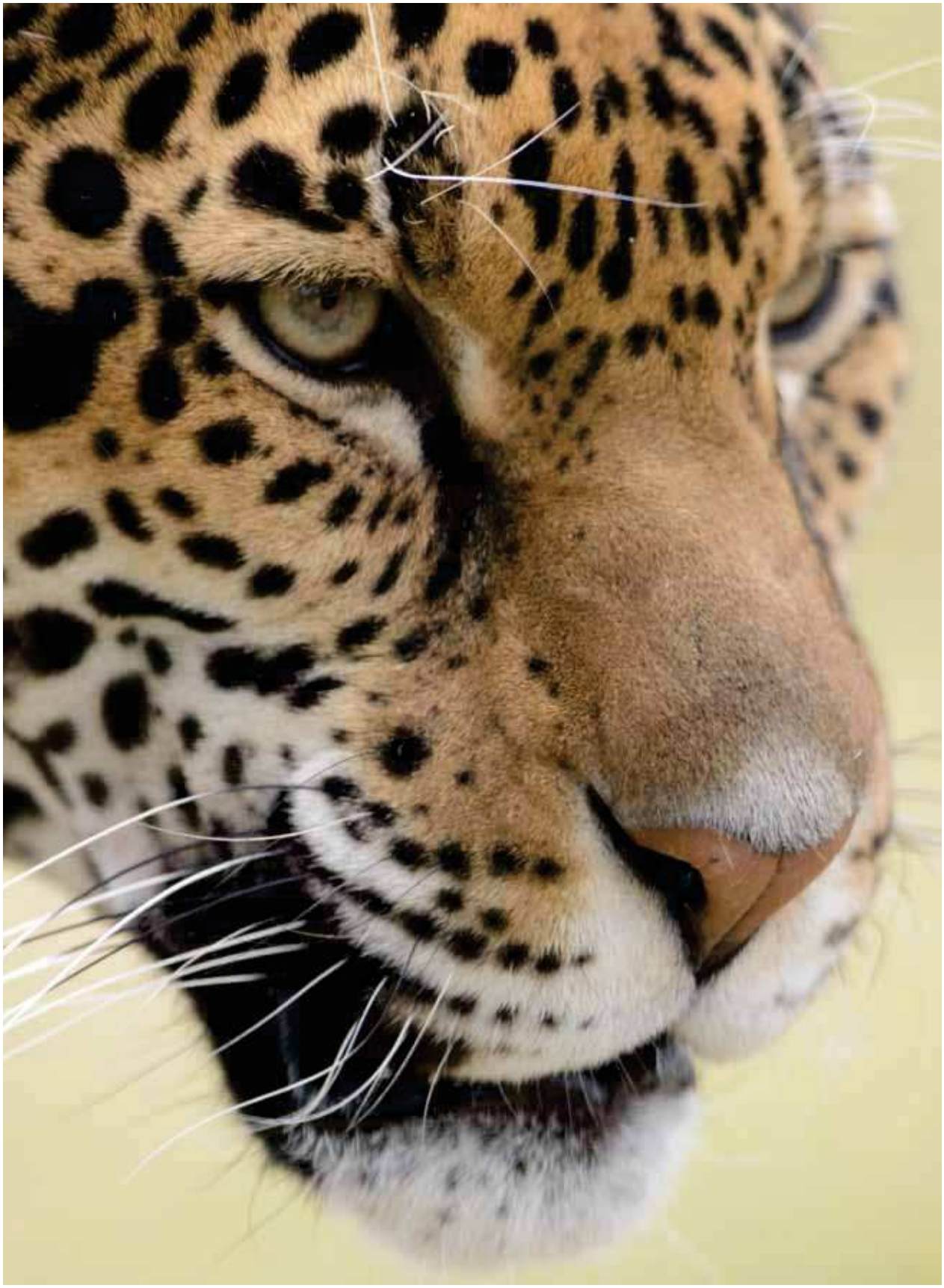
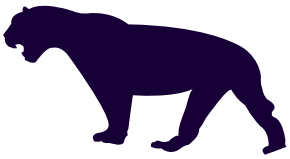


The jaguar *(Panthera onca)*, the big cat of the Amazon and a rainforest icon

EXECUTIVE SUMMARY

The Amazon is the world's largest rainforest and the largest river basin on the planet. More species are found here than anywhere else. Such is the extraordinary diversity of life in the Amazon that the region is believed to be home to 10%, 1 in 10, known species on Earth.

The Amazon biome



There are 390 Protected Areas in the Amazon, representing 25% of the biome and totalling some 167 million hectares

The Amazon is home to 34 million people, including 385 indigenous groups

17% of the Amazon has been destroyed

A compilation of species in the Amazon region from 2002 showed that there are at least 40,000 plant species in this vast biome, 75% of which are endemic to the region. In addition, the same study found that 427 mammals, 1,300 birds, 378 reptiles and 427 amphibians had been scientifically classified for the region, as well as at least 3,000 species of fish. This is the largest number of freshwater fish species in the world. The same level of diversity can almost certainly be said for invertebrates. About 50,000 species of insects can be found in any 2.5 sq km of Amazon rainforest. More recent studies have recorded vastly increased numbers of species of plants and vertebrates in the region.

It is estimated that the region contains almost 10% of the global reserve of carbon stored in its diverse ecosystems. Carbon storage is just one of a multitude of ecosystem services provided by the Amazon at the local, regional and global levels, the most critical of which are storage of freshwater, regional climate regulation (including rainfall provision to the breadbasket of South America, in the central part of the continent), and a treasure trove of biological diversity. This unparalleled natural wonder is also home to 34 million people, including 385 indigenous groups.

With great diversity comes great responsibility. Today the Amazon is facing a multitude of threats as a result of unsustainable economic development. The search for land, energy sources and minerals, with large scale deforestation due to the wide dissemination of agribusiness (primarily cattle and soy, but ncreasingly palm oil) and infrastructure development, has resulted in 17% of Amazon forest being destroyed or deforested and much more is severely threatened as the destruction continues.

Protected areas (PAs) are the best known mechanism to conserve Amazon ecosystems for people and the planet. This report analyses the evolution of the PAs network of the Amazon, from 1960 to 2013. It examines the main advances in PA creation by each Amazon country and assesses how successful efforts have been in ensuring the representation of different ecosystems in the PA network at the regional level. The role of the indigenous territories (ITs) is also presented in this context.

For the populations living in or around Amazon PAs, these mechanisms are of direct economic importance. Harvesting of non-timber forest products and sustainable timber extraction are regulated in many sustainable use areas. Tourism and exploration activities have created employment in specific, well-visited areas.

The importance of well-conserved ecosystems for indigenous peoples is even greater; often their entire territories have high conservation value. Thanks to increasing recognition of indigenous peoples' rights and their positive contribution to nature conservation, ITs are increasingly considered an effective mechanism to conserve Amazon ecosystems, in addition to their primary role to secure indigenous peoples' rights to their ancestral lands.

Conclusions

The Amazon is a 'conservation must' for local, national and global societies and governments. In addition to its unparalleled biodiversity, the Amazon provides an array of critical ecosystem services and key aspects of human well-being. The main value of Amazon PAs to global societies is to assure the core of a larger, complex and interdependent system that provides ecosystem services through water regulation, climate regulation and the provision of raw materials. For the populations living in or around Amazon PAs, and for the Amazon countries themselves, these areas have direct economic and subsistence importance.

The Amazon plays a critical role in regional and global climate stability, not just because it locks carbon into its soils and vegetation, but due to its role in promoting air and moisture circulation (from the Atlantic Ocean to the eastern Andean slope and to the central and southern parts of South America, the so-called 'flying rivers' of the Amazon). The region's abundance of natural resources is currently being exploited on an industrial scale. The economic development in the Amazon region varies greatly among the countries of the region. It is estimated that the Amazon regional GDP reaches US$330 billion dollars per year, of which the Brazil portion alone accounts for more than 70%. The annual average GDP per capita for the region is US$5,500 thousand dollars, but there is great variation between the countries.

While progress has been made in recent years to improve the standard of living in the region, on numerous indicators Amazonia's citizens remain poor. The stark reality is that the wealth created within Amazonia has enriched few Amazonians.

The Amazon Biome is suffering from increasing pressure on several fronts. Nature protected areas (PAs) – which, together with indigenous territories (ITs) and other community conserved areas (CCA) are among the most important defence mechanisms for biodiversity and sustainable ecosystem management – are themselves increasingly under threat from development projects, often resulting in their downgrading, downsizing or degazzettement, usually without any offsetting or compensation efforts. Political and physical threats to indigenous territories are also escalating. If current deforestation rates of 2 million hectares per year continue, 25% could be lost by 2020. Freshwater ecosystems are also under threat. Important geopolitical developments, related to the domination of the territory as a result of 'national security' (border) and 'national integration' policies, has seen the increased establishment of roads, settlements and military presence.

Protected Areas (PAs)

This report considers mainly PAs that are included in national PA systems. By 2013 the surface area in the Amazon under protection was significant, with 390 PAs, representing 25% of the Amazon biome, totalling some 167 million hectares. The number and total area encompassed by PAs in the Brazilian Amazon is impressive, and much larger than the other countries that share the rainforest, although this is relatively consistent with its larger share of the Pan-Amazon. Some countries (Brazil, Bolivia, Venezuela and Ecuador) have between 20 and 30% of their Amazon biome in nature PAs, while others (Colombia, Peru and Suriname) only have between 10 and 20% protected. However, the report concludes that despite this seemingly extensive coverage, ecological representation of the Amazon biome is neither sufficient nor adequate.

The area of the Amazon under protection increased slowly from 1960 until 1988. From 1990, however, the growth of the total protected area gathered pace, with some remarkable jumps in total coverage taking place around 1990 and 2006. Unfortunately the pace of PA designation in the Amazon has reduced from the end of the last decade, and since 2009 has been almost flat. Even worse, with the increased intensity of the drivers of habitat loss on several fronts, nature PAs and ITs (and similar areas) are under significant pressure, with an increased frequency of attempts to reduce or degrade them.

There have been some important trends in the evolution of PA management over the years. Greater attention has been given to creating groupings of PAs (corridors, mosaics, systems), both in geographical and in management terms. A more inclusive approach to PA designation by governments and the conservation movement has developed, as well as a greater interest and appropriation of conservation mechanisms by local communities and indigenous peoples.

In terms of IUCN's protected area management categories, in the last decade there has been a shift in the policy focus of PA designation by Amazon countries from more strict preservation areas (Categories I-IV) in the 1980's (when almost 80% of protected areas were strict preservation areas) to sustainable use areas (now approximately 60% of all protected areas).

However, the challenges currently faced by Amazon PAs are often problems that come 'from within", such as poor design (particularly a failure to adequately represent freshwater ecosystems), poor management, conflicts with indigenous peoples and other local communities, and a lack of integration with regional, national and subnational sustainable

development policies, plans and programmes, which over time could undermine the efforts and gains made so far, jeopardising the achievement of internationally-agreed social, economic and environmental goals and targets.

Better understanding is still needed on how to make systems of PAs fully functional and how to integrate them into national and regional development and land-use plans.

Indigenous Territories (ITs)

Indigenous peoples (IPs) and local communities have long been interacting with nature in the Amazon. The Amazon is one of the best conserved natural regions on Earth, with large nature PAs and important mosaics. Indigenous territories (ITs) have also played an important role. But, not all IPs (and other local communities) have seen their rights being respected and not all of their territories have been duly recognised, demarcated and enforced.

In terms of indigenous peoples' rights, this report follows a "non-restrictive" approach to defining indigenous territories that includes different denominations or types of ITs and similar areas (although a majority of the areas are ITs recognised by governments, there are significant numbers of proposed and non-recognised areas).

In 2010 there were 3,043 ITs and similar areas within the Amazon Biome (not all of them officially recognised), with a total of almost 208 million hectares. These areas represent 31.1% of the Amazon.

According to some indigenous peoples and as reflected in most country legislations, ITs are not established for nature conservation purposes *per se*. ITs are set up primarily to recognise the rights of indigenous peoples to land and natural resources for social, cultural and equity reasons, and are managed and utilised through a combination of traditional and new sustainable practices. However, they can also contribute to the conservation of nature and offer opportunities for reconnecting with nature through the lessons of their cosmogonies.

Ecological Representation in the Amazon

Despite the expansion of nature PA networks across the Amazon, and regardless of whether they are considered collectively (for the entire region) or individually (as national PA systems), they still do not ensure sufficient ecological representation of Amazon ecosystems types. This report suggests that a minimum target of 30% of the Pan-Amazon area with good ecological representation will ensure that at least a core area is maintained for the continued provision of Amazon ecosystem services for the region and the world, including the mitigation of global climate change. This needs to be accompanied by efforts to maintain ecosystem processes and freshwater flows in about 60-70% of the Amazon, as well as reaching zero net deforestation by 2020 and assumes a 20% maximum conversion area for climate purposes. This target should not be understood as 30% of the species or 30% of the ecosystems, but rather the best possible attempt, using proxies, to protect an ecologically representative sample of 100% of Pan-Amazon biodiversity.

The analysis of Amazon ecological representation based on terrestrial ecoregions, when considering only nature PAs, has found that when applying the classic (and now outdated) 10% target, 31 out of 36 terrestrial ecoregions are sufficiently well represented. When considering the global average 17% target (Aichi Target 11), the number of ecoregions satisfactorily represented dropped to 23. If using WWF's recommended 30% target, only 11 ecoregions are sufficiently well protected. When the ITs and similar areas are included in the analysis, as expected, the ecological representation is increased. The 10% target is achieved for all ecoregions; the 17% target is achieved for 34 out of 36 ecoregions; and for the 30% target, there is a conservation gap in 5 ecoregions. The analysis of ecological representation based on freshwater heterogeneous units (or 'aquascapes') found that 39% of the 312 freshwater units/aquascapes are not represented in PAs, whereas 22% are not represented in either PAs or ITs. Only 65 freshwater systems/aquascapes (21%) have more than 30% of their range within PAs. However, if we consider PAs and ITs combined, almost half of them have more than 30% of their range protected.

Thus, through the assessment of ecological representation, it becomes easier to argue for higher ambition levels of protection targets, recognising their different purposes, roles and functioning rules. Unfortunately areas that are less well represented in the protection schemes are also those that have been most destroyed, degraded or are under the most conversion pressure. This highlights the urgency of assuring the minimum (30%) ecological representation before the biological diversity in these areas is lost forever.

In many countries the creation of new protected or sustainably managed areas is being put on hold, while threats to existing areas that are critical for climate change adaptation continue to grow. The situation is echoed for indigenous groups and their territories in the region. The development of hydroenergy and new road infrastructure projects are affecting the physical and legal integrity of PAs.

Nature PA systems represent the Amazon's 'biodiversity safety net'. Networks and blocks of well-designed and well-managed protected areas enhance the resilience of the region to the anticipated impacts of climate change. At the same time, recognition of indigenous peoples' rights and territories represents the 'ethical bottom line' for respecting and safeguarding the ethnic and cultural heritage of the Amazon, as well as enhancing the conservation gains made by PAs.

Recommendations

Recognising the role of nature PAs and ITs (and similar areas) within wider development planning contexts in the Amazon region helps to realise the gains made over the past 50+ years to establish and improve the management of PA systems and ITs. By engaging government actors in a regional dialogue for the adoption of an Amazon-wide vision, these lands can be mainstreamed into the development plans for the Amazon, enhancing negotiation leverage with private sector developers to limit the impact of large-scale projects such as dams and curb deforestation in the biome.

A key objective of WWF's Living Amazon Initiative is that ***by 2020 the national systems of PAs and a large proportion of indigenous people's territories in the Amazon countries are being effectively stewarded for conservation and sustainable development values. The aim is that these areas are fully integrated into the region's development agenda, ensuring ecological representation and ecosystem connectivity while maintaining and valuing the indispensable environmental, social and cultural values they provide***.

In order to achieve this ambitious objective, and to realign development in the Amazon region on to a more sustainable pathway, new measures are necessary to mitigate the threats and alleviate pressures currently facing the Amazon's network of PAs and ITs. Therefore, WWF, through its Living Amazon Initiative (LAI), proposes a series of **recommendations** in Chapter 8 to be adopted and implemented by decision makers in governments, the private sector and the wider societies in the 9 countries that share the Amazon biome (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela and France through the overseas territory of French Guiana), as well as by those in the wider global community. A summarised version of each recommendation can be found below:

- **1. Adopt a more integrated vision of sustainable development and nature conservation, where protected areas (PAs) are one part of a broader set of nature conservation strategies (biodiversity, ecosystem services, landscapes, aquascapes), development plans and economic policies.**

- **2. Fully implement the Aichi Targets, in particular Targets 5 and 12 and most especially Target 11, and collectively agree on an integrated approach to increase the ecological representation in the Amazon to 30% to ensure that a minimum representative area of Pan-Amazon ecosystems is effectively protected**.

- **3. Increase the integration between PA systems, sub-systems and individual PAs, as well as between nature-based PAs and social/ethnic-based areas such as indigenous territories (ITs) and community conserved areas (CCAs), aiming to establish functional ecological networks (including ecological corridors).**

- **4. Actively engage in collaborative arrangements with neighbouring countries in the establishment of transboundary PAs, as well ecologically-based (e.g. for migratory fish) and thematically-related (e.g. cross-boundary ecotourism initiatives) networks, through the implementation of exchanges and integration actions.**

- **5. Actively seek international recognition of high value sites for conservation and sustainable development in the Amazon, including by the Ramsar Convention on wetlands of international importance and the World Heritage Convention under UNESCO.**

- **6. Use PAs as test-beds for advancing science and technology research in order to effectively inform current models of development and to shift production to a more sustainable productive matrix (based in the sustainable use of renewable resources).**

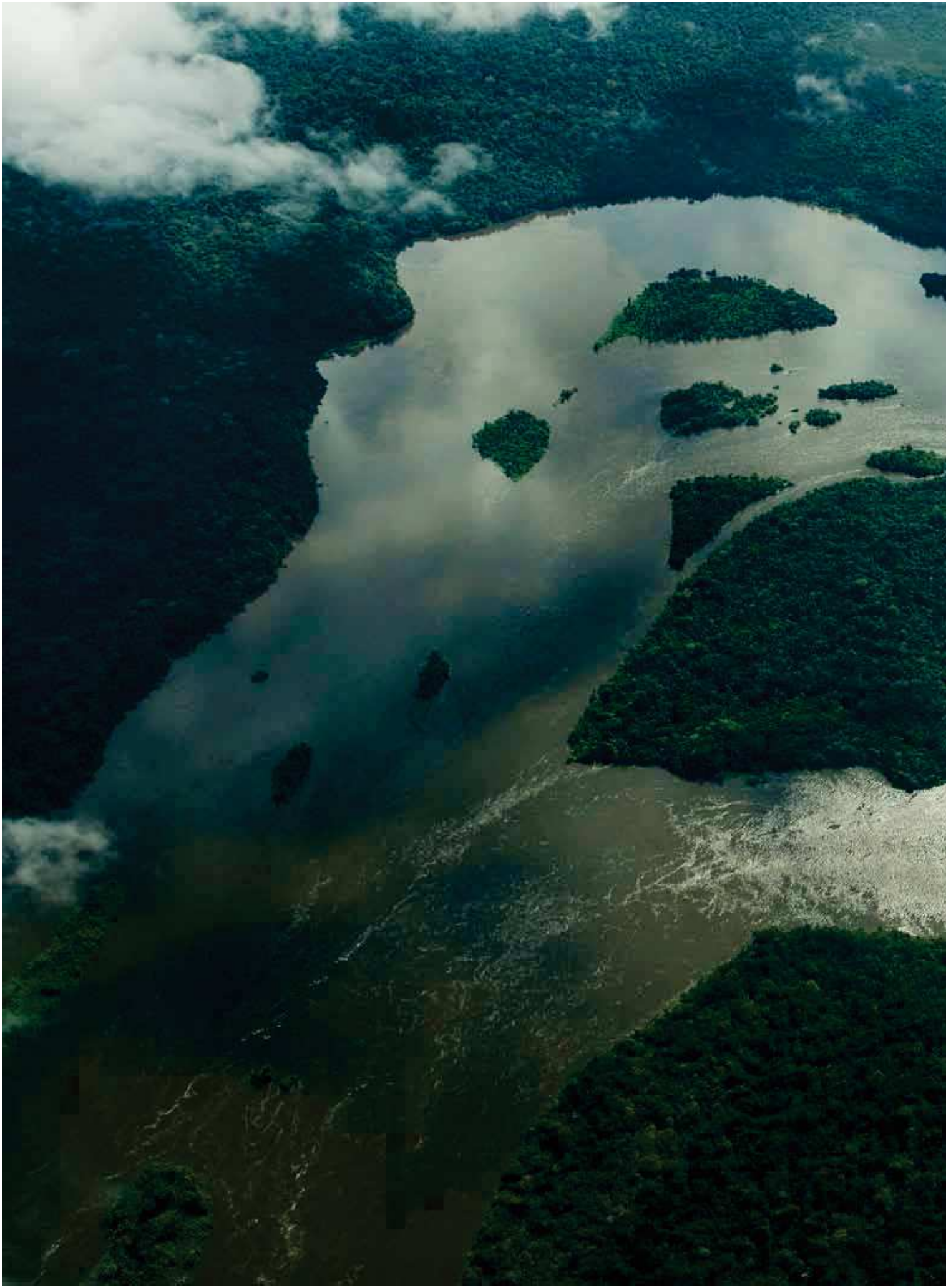
- **7. Fully recognise the rights of Amazon indigenous peoples and local communities in all Amazon countries, including recognition of ITs, community conserved areas (CCAs) and the sub-national political entities of the region.**

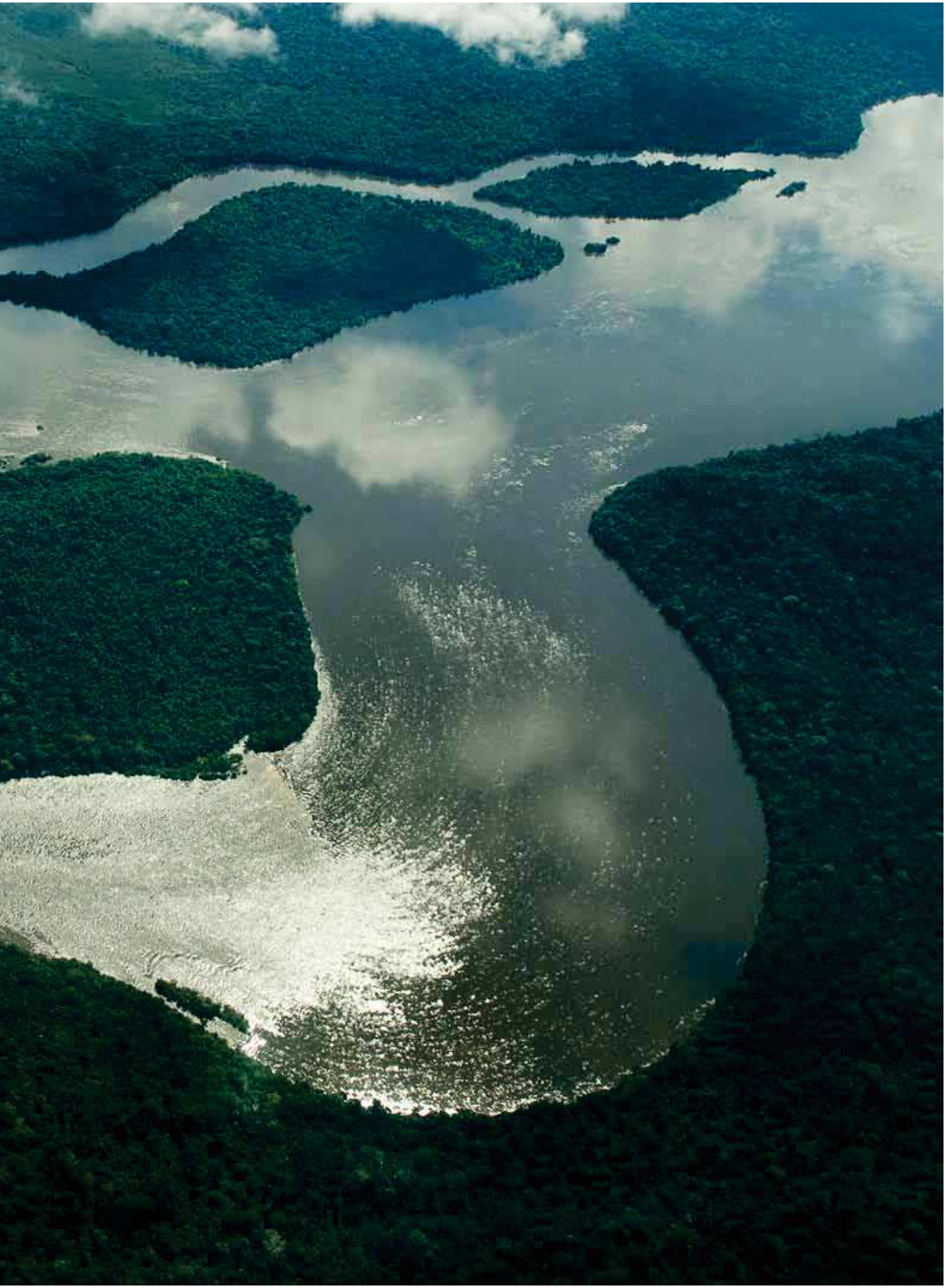
- **8. Adopt national policies and programmes to control and avoid ecosystem conversion (including deforestation and river fragmentation) in under-represented ecoregions in the Amazon biome, and in particular, apply the 'non-regression principle' to prevent the downgrading, downsizing and degazzettement of PAs (PADDD) in the region.**

- **9. Ensure that spatial and land use planning and management policies and practice integrate PAs and ITs alongside other forms of land use, communicating land tenure pressures effectively, and ensuring access by local communities and indigenous peoples to the natural resources they depend on.**

- **10. Ensure adequate resourcing for the development of scientific knowledge needed for environmental monitoring in the Amazon**.

- **11. Establish effective regulation and voluntary standards for public and private economic and financial activities in the Amazon region.**





Aerial view of Juruena river, Brazil. The Amazon is the largest rainforest and river basin in the world

Giant otter *(Pteronura brasiliensis)*, one of many unique and charismatic species found in the Amazon

1.0 INTRODUCTION

The Amazon is home to a diverse array of species, habitats, ecosystem services and indigenous communities, with its rich natural resource base providing a source of livelihoods for millions both within and outside the region.

However, this treasure trove of our planet has not escaped the gigantic appetite of unsustainable development. At least 17% of the Amazon forest has been destroyed and much more is severely threatened as the destruction continues. The loss of tropical rainforest has a profound and devastating impact on the world because rainforests are so biologically diverse, and the ecosystem services they provide so critical to climate stability.

The vision of WWF for the Amazon is to have an ecologically healthy biome that maintains its environmental and cultural contribution to local peoples, the countries of the region, and the world, within a framework of social equity, inclusive economic development and global responsibility.

With our partners in government and the private sector our goal is to ensure that a minimum representative area of Pan-Amazon ecosystems is effectively managed in nature protected areas (PAs). This paper suggests that a minimum target of 30% of ecological representation would ensure the maintenance of Amazon ecosystem services for the region and the world, including the mitigation of global climate change. This target should not be understood as 30% of the species or 30% of the ecosystems, but rather the best possible attempt to protect an ecologically representative sample of 100% of Pan-Amazon biodiversity.

Although not enough alone, it is well recognised that nature PAs are the best mechanism to preserve biodiversity, particularly when complemented by indigenous territories (ITs) and other measures.[i] Therefore, to contribute to the goal, WWF initiated a process to assess and monitor the representation of Amazon ecosystems in PAs and ITs. The present report analyses the evolution in the Pan-Amazon (nature) PAs network between 1960 and 2013, as a baseline for reassessment every 5 years. It examines progress in protected area designation by each Amazon country as well as current status, amount of area protected, management category, sets (e.g. mosaics) and other elements. The report discusses the extent to which these efforts ensure adequate representation of different Amazon ecosystems in existing nationally designated protected area networks, complemented by ITs, considering present and past targets (30, 17 and 10%).

The specific objectives of this report are:

(i) assess level of the Pan-Amazon ecological representation;
(ii) organise information and understand the evolution of (nature) PAs and ITs (and similar areas) in the region;
(iii) communicate them to governments, academy, private sector, media and society in general, and;
(iv) contribute to positive policy development and constructive advocacy for nature-based solutions for sustainability by public and private sectors.

[i] To achieve the globally agreed CBD-related 2020 Aichi Targets, surface area on its own is not enough; protected areas need to be effectively and equitably managed, ecologically representative, well-connected and integrated into the wider landscapes.

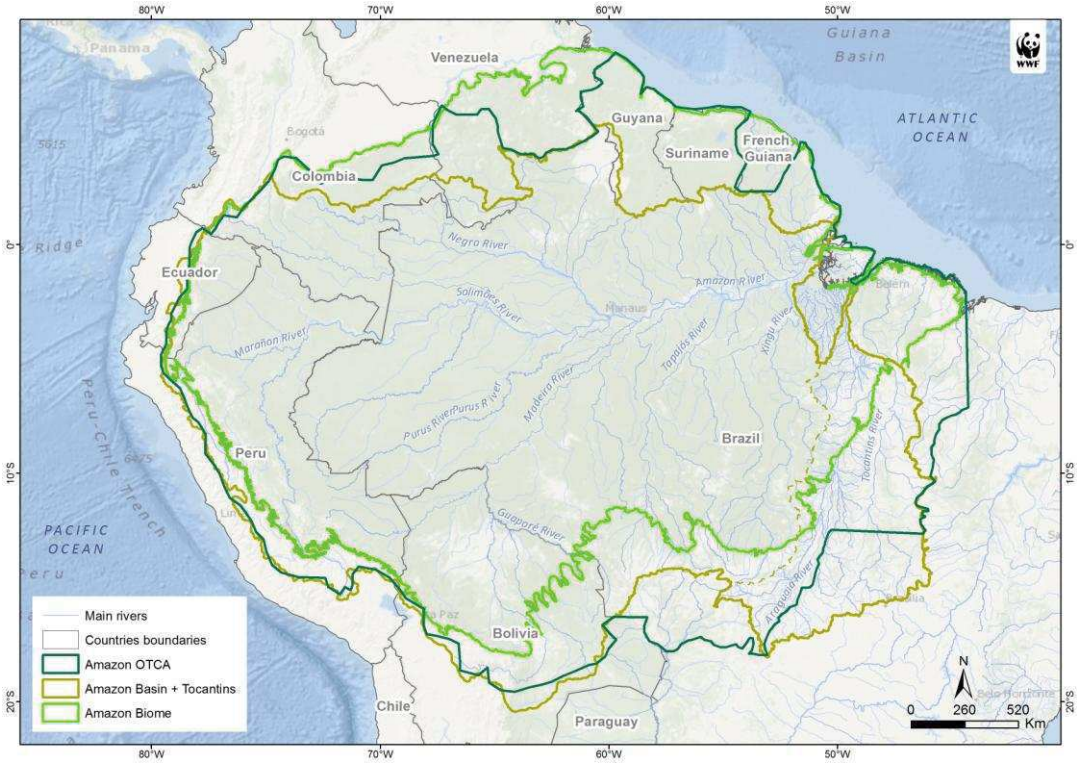
2.0 THE AMAZON BIOME

2.1 Geographic scope

There are many different 'Amazons' according to how they are defined. The most commonly used and the less disputed boundaries are those of the 'Amazon river basin'. A legal-political-administrative Amazon region is defined by the countries in the Amazon Cooperation Treaty Organization (OTCA). Arguably however, for many people the most important concept is the 'ecological' Amazon.

Also known as the Amazon Biome[i] **(Figure 1)**, this vast green area of forest possesses unparalleled wealth in aquatic and terrestrial biodiversity, conjuring some of the most powerful images of what nature can offer. Spanning 6.7 million square kilometres, the Amazon Biome is virtually unrivalled in scale, complexity and opportunity, and is defined as the area covered predominantly by dense moist tropical rainforest, interspersed with diverse types of other vegetation (such as savannas, floodplain forests, grasslands, swamps, bamboos, palm forests) and unique freshwater ecosystems **(Table 1)**. The Amazon Basin is the world's largest river basin, extending southwards beyond the southern boundaries of the biome, but excluding much of the Guianas Shield in the north. In addition, a legal-political-administrative region has been defined by the Amazon countries within the scope of OTCA.

Figure 1. The Amazon (river basin, biome and legal-political-administrative limits)



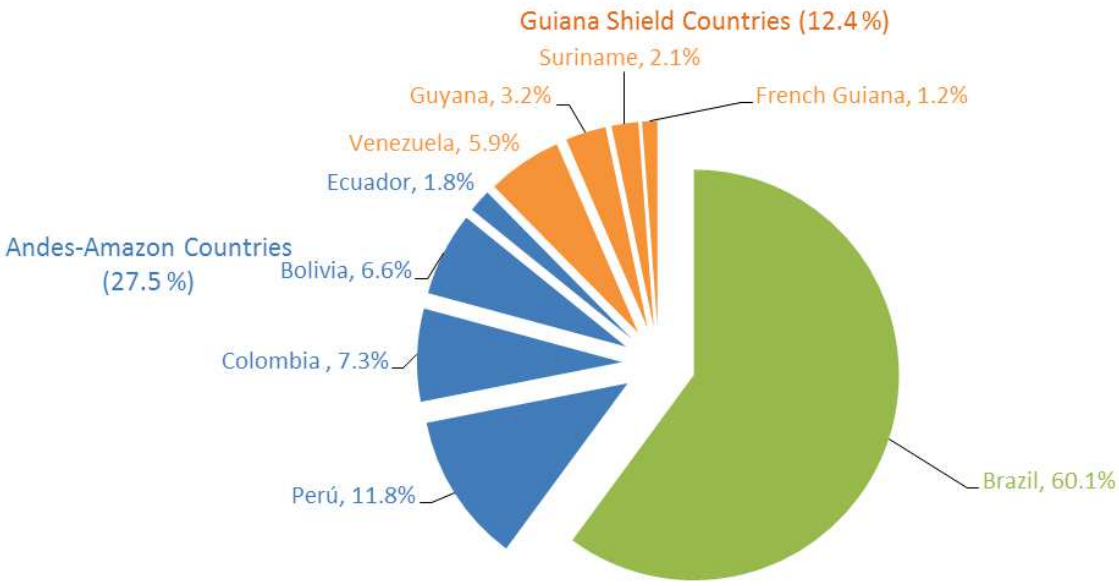
[i] Based on the Terrestrial Ecoregions of the World base map (Olson and Dinerstein, 1998). For the characterization of the Amazon's freshwater biodiversity and hydrological processes, however, the study area was expanded beyond the biome to include complete watersheds which sometimes include adjacent biomes (dry forest, cerrado and puna). The biome boundary was further refined in each of the Amazon countries using the best available maps: Brazil – IBGE´s vegetation map ; Bolivia – Navarro´s vegetation map ; Peru – IIAP´s (Peruvian Amazon Research Institute) map of the Amazon ; Ecuador – Sierra´s vegetation map ; Colombia – Etter's ecosystems map; Venezuela – Huber and Alarcon's vegetation map . The Guiana Shield base map was used for the definition of the boundaries of Suriname, Guyana and French Guiana. The map in Figure 1 is based on the original map developed for WWF´s Ecological Vision priority setting analyses during 2007. The GIS calculated surface of the Amazon biome was 6.7 million sq kms.

Table 1. Percentage of each vegetation type within the biome[1,2]

Landscape/vegetation type	% of biome
Tropical evergreen forest	79.9%
Anthropic (incl. pastures & crops)	6.8%
Savannas	4.0%
Flooded and swamp forests	3.9%
Deciduous forest	1.4%
Water bodies	1.2%
Other types (incl. shrubland & bamboo)	2.8%

The extraordinary Amazon Biome is shared by eight countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, and the overseas territory of French Guiana. Brazil harbours the largest portion of the biome (60%), followed by Peru (11.8 %), Colombia (7.3 %) and Bolivia (6.6 %). The Andean Amazon countries together house 27.5 % of the biome, and the Guiana Shield countries 12.4 % **(Figure 2)**.

Figure 2. Percentage of Amazon biome in countries and sub-regions[3,4]



A spectacular species of poison dart frog *(Ameerega pepperi)* discovered in 2009 in the Peruvian Amazon

2.2 Biodiversity

The Amazon Biome is of immeasurable ecological importance. It is the most biodiverse region on the planet and forms the largest extension of intact tropical forests. More species of primates can be found in the Amazon than anywhere else on Earth. A compilation of species in the Amazon region from 2002 found at least 40,000 plant species, 75% of which endemic to the region.[5] In addition, the same study found that 427 mammals, 1,300 birds, 378 reptiles and 427 amphibians had been scientifically classified for the region. With some estimates as high as 3,000, this is the region with the largest number of freshwater fish species.[6] The Amazon is also home to the longest known migration for a freshwater fish species in the world: the 'dourada' (*Brachyplatystoma rousseauxii*) travels 2,500 miles from the Atlantic to the Andes to spawn[7]. For the largest groups of living beings, the invertebrates, however, it is almost impossible to list. In approximately five hectares of Amazon rainforest, 365 species from 68 genera of ants were found[8]. By the beginning of the 21st Century, between 96,660 and 128,840 species of invertebrates had been described by scientists in Brazil alone.[9] In short, many experts believe the region probably encompasses 10% of the world's known biodiversity.[10,11,12,13]

Furthermore, numbers of known species rapidly become outdated due to the huge extent of many of the unique habitats, the inaccessibility of much of the vast Amazon region and the unceasing discoveries (a new species of fish is discovered in the Amazon every 3.5 days[14]). Between 1999 and 2013, scientists discovered and described a mind-boggling 1,661 new species of plants and vertebrates in the Amazon. These new species included 40 mammals, 34 birds, 274 amphibians, 77 reptiles, 341 fish, and 895 species of plants.[15] This extraordinary rainforest also houses endemic[i] and endangered flora and fauna. The Amazon's habitats are the world's last refuge for threatened species such as jaguars (*Panthera onca*), harpy eagles (*Harpia harpyja*) and pink river dolphins (*Inia geoffrensis*). There are also giant otters (*Pteronura brasiliensis*), scarlet macaws (*Ara macao*), hyacinth macaws (*Anodorhynchus hyacinthinus*), southern two-toed sloths (*Choloepus didactylus*), pygmy marmosets (*Cebuella pygmaea*), saddleback tamarin (*Saguinus fuscicollis*) and emperor tamarins (*Saguinus imperator*), Goeldi's monkeys (*Callimico goeldii*) and howler monkeys (*Alouatta sp.*).[16] Further charismatic characters include purple tarantulas (*Pamphobeteus grandis*), purring monkeys (*Callicebus caquetensis*), vegetarian piranhas (*Tometes* sp.), bald parrot (*Pyrilia aurantiocephala*), electric knifefish (*Compsaraia samueli*) and psychedelic-coloured poisonous dart frogs (*Ranitomeya amazonica*).[17]

2.3 Ecosystem services

The Amazon is the world's largest river basin. It is drained by the greatest freshwater system on Earth, both in length and in volume, and holds a staggering 12-20% of the world's global freshwater[18] (freshwater not held in ice caps, glaciers or permanent snow). The Amazon is very important for its carbon stock and it is estimated that the region contains almost 10% of the global reserve of carbon stored in land ecosystems.[ii,19]

The role of the Amazon in climate stability and functioning is even more important than the amount of carbon it stores. The rainforest drives the atmospheric circulation in the tropics by absorbing energy and recycling about half of the rain which falls on it.[20] The trees absorb water from the ground and pump out billion of tonnes of water vapour a day (a process called evapotranspiration) into vast "flying rivers".[21] These flying rivers may transport as much water as the Amazon river itself. The forest recycles 20-25% of the rainfall it receives[22,23,24,25] and air travelling over extensive forest cover may generate twice as much rainfall as air over deforested land.[26] Scientists have determined that a single large tree in the centre of the Amazon forest can give off up to 300 litres of water in a day.

This vital moisture is important for sustaining South American rainfall and economies[27]. Farmers in the Amazon's fertile Mato Grosso state are highly dependent on Amazon rain to grow their crops, for example. The enormous agriculture industry in the region is extremely profitable because so little irrigation is needed. In addition, 80 percent of Brazil's energy derives from hydroelectric power generation, so every single drop of rain counts.

The Amazon is locally and globally important across all ecosystem service categories (such as supporting, provisioning, regulating, and cultural) and for all components of human well-being (security, health, social relations and freedom of choice and action for example). Historically, Amazon biodiversity resources have been the basis of local, national, regional and world economies and are used for food, building materials, making tools and utensils, as raw materials for

[i] Endemic refers to a species that is exclusively native to a specific place and found nowhere else. For example, the kiwi is a bird endemic to New Zealand.

[ii] An ecosystem is a community of living organisms (plants, animals and microbes) in conjunction with the nonliving components of their environment (like air, water and mineral soil), interacting as a system.[Tansley (1934); Molles (1999), p. 482; Chapin et al. (2002), p. 380; Schulze et al. (2005); p. 400; Gurevitch et al. (2006), p. 522; Smith & Smith 2012, p. G-5].

Textbox 1. The Amazon Headwaters Initiative

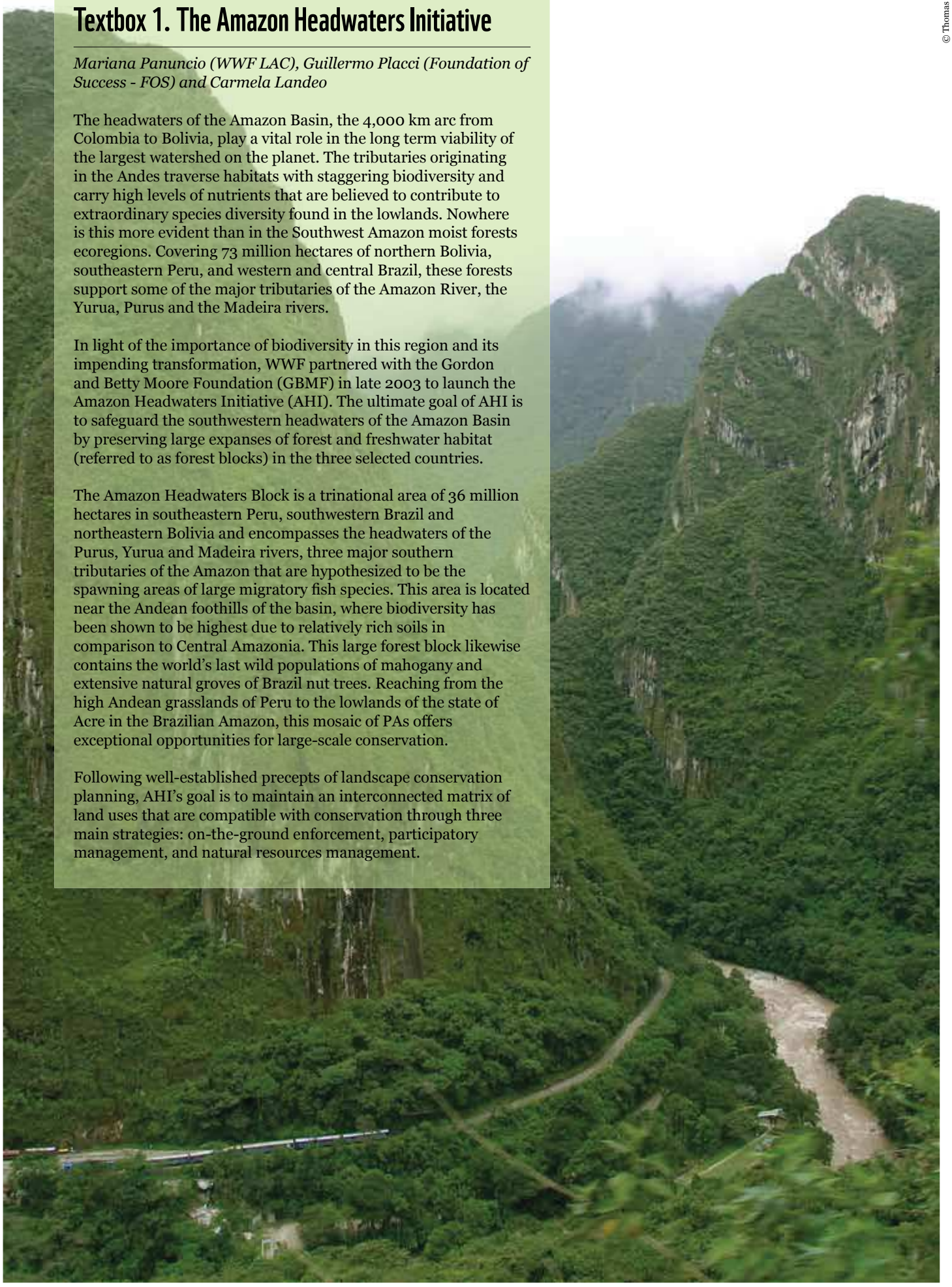
Mariana Panuncio (WWF LAC), Guillermo Placci (Foundation of Success - FOS) and Carmela Landeo

The headwaters of the Amazon Basin, the 4,000 km arc from Colombia to Bolivia, play a vital role in the long term viability of the largest watershed on the planet. The tributaries originating in the Andes traverse habitats with staggering biodiversity and carry high levels of nutrients that are believed to contribute to extraordinary species diversity found in the lowlands. Nowhere is this more evident than in the Southwest Amazon moist forests ecoregions. Covering 73 million hectares of northern Bolivia, southeastern Peru, and western and central Brazil, these forests support some of the major tributaries of the Amazon River, the Yurua, Purus and the Madeira rivers.

In light of the importance of biodiversity in this region and its impending transformation, WWF partnered with the Gordon and Betty Moore Foundation (GBMF) in late 2003 to launch the Amazon Headwaters Initiative (AHI). The ultimate goal of AHI is to safeguard the southwestern headwaters of the Amazon Basin by preserving large expanses of forest and freshwater habitat (referred to as forest blocks) in the three selected countries.

The Amazon Headwaters Block is a trinational area of 36 million hectares in southeastern Peru, southwestern Brazil and northeastern Bolivia and encompasses the headwaters of the Purus, Yurua and Madeira rivers, three major southern tributaries of the Amazon that are hypothesized to be the spawning areas of large migratory fish species. This area is located near the Andean foothills of the basin, where biodiversity has been shown to be highest due to relatively rich soils in comparison to Central Amazonia. This large forest block likewise contains the world's last wild populations of mahogany and extensive natural groves of Brazil nut trees. Reaching from the high Andean grasslands of Peru to the lowlands of the state of Acre in the Brazilian Amazon, this mosaic of PAs offers exceptional opportunities for large-scale conservation.

Following well-established precepts of landscape conservation planning, AHI's goal is to maintain an interconnected matrix of land uses that are compatible with conservation through three main strategies: on-the-ground enforcement, participatory management, and natural resources management.



Amazon headwaters high in the Andean foothills. All rivers eventually lead to the lowlands of the mighty Amazon river

manufacturing (textiles, handicrafts, pharmaceuticals, biotechnology, wood, dye, perfumes, resins, gums, oils, etc.), and also in socio-cultural ceremonies, traditions and rituals.

The Amazonian ecosystems, including biological and physical processes, also directly and indirectly provide other goods and services essential to humanity, among which are the regulation of hydrological cycles, climate regulation (moderation of floods, droughts, extreme temperatures, air currents), carbon sequestration, oxygen production, soil conservation, erosion control and the control of pests and diseases.[28]

The Amazon is a hugely complex and inter-dependent system of tropical rainforests, rivers and atmosphere. The degradation of one part can have very negative effects on others. It is of fundamental importance for the local communities and indigenous peoples living there, but also for the sustainable development of the countries within its boundaries and the world, due to its immense biodiversity and critically important ecosystem services, including climate security.

Although the biome comprises a multitude of different ecosystems, it forms a single ecological functioning entity, in which the many parts depend on the ecological integrity of the whole biome.[29] A good example of the inter-dependence between Amazon ecosystems and the need to ensure ecological representation and biome-wide functionality is described in the so-called Amazon Headwaters Initiative **(Textbox 1)**.

Ensuring ecological representation of the Amazon as a whole, as well as maintaining an adequate minimum level of functioning ecosystem processes is of fundamental importance for climate stability at the national, regional and global scales. Through nature-based climate change mitigation and adaptation strategies[i] the Amazon can avert 'natural' catastrophes.[30,31,32]

[i] Climate change mitigation refers to actions to limit the magnitude and/or rate of long-term climate change. Climate change adaptation refers to a response to global warming that seeks to reduce the vulnerability of social and biological systems to climate change effects.

Member of local community wearing traditional headdress, Juruena, Brazil

3.0 THE SOCIO-ECONOMIC DIMENSION OF THE AMAZON

3.1. Human settlement and population[33,34]

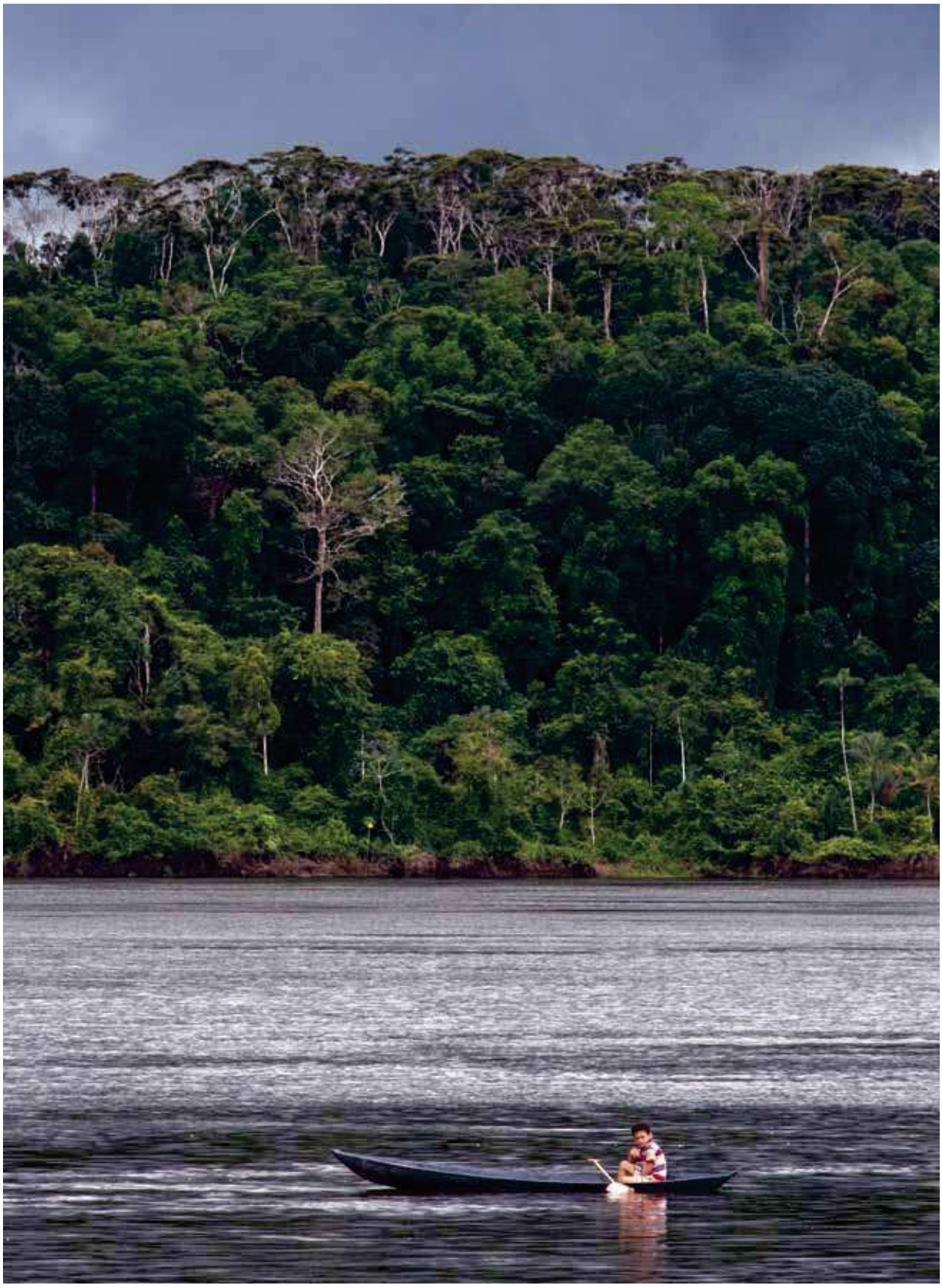
Humans have lived in the Amazon region for at least 11,000 years.[35] The arrival of the Europeans, and subsequently peoples from Africa and Asia, signalled the beginning of a dark chapter that had a strong impact on the indigenous peoples as a result of new settlements and exploration of natural resources, slavery and genocide. There were historically-important immigration movements related to the extraction of natural rubber, driven mostly by the two large wars of the 20th Century and the industrialization of the US and Europe, particularly the automobile industry. Despite this, roughly up until the Second World War the occupation of the Amazon was mostly sparse, with very low density and with relatively small impacts on the natural environment.

Since the mid-20th Century, first in Brazil and later in other Amazonian countries, the region has seen an intensification of human occupation and use of natural resources, including land, minerals, and sources of energy. Important geopolitical developments related to the domination of the territory as a result of 'national security' (border) and 'national integration' policies, have seen an increase in the establishment of roads, settlements and military presence. Besides their direct effects, roads have opened the way for further settlement, increased exploration, more intensive use and exploitation of resources like timber, minerals, oil and gas and hydropower. Examples include the relatively recent expansion of soya plantations in the southern Brazilian Amazon (mostly Mato Grosso); access to oil and gas deposits in the Amazonian parts of the Andean countries; more technical and capital intensive cattle ranching in several parts (including the state of Pará), and the reactivation of hydroelectric projects (that were on hold from 20+ years ago due to the earlier resistance to dam building in the Xingu river basin), as well as building more new roads and renovation of existing roads, and the fluctuations of mining.

Today, the Amazon population is estimated at 34.1 million inhabitants **(Table 2)**, which represents 11% of the population of South America.[36] The countries with the largest Amazon population are Brazil (70%) and Peru (11%). The average demographic density for the Amazonian region (4.5/km^2) is almost five times lower than the South American average (20/km^2). Although the population is traditionally associated with forest dwellers and rural settlers, 65% of the population are living in fast growing urban centres such as Manaus (Brazil), Iquitos (Peru) and Belém (Brazi).[37]

Land use among the population in the Amazon region ranges from industrial zones to historical cities, as well as local communities (rubber tappers, riverine settlers, etc.), African-descendant communities and indigenous peoples. The latter comprises 385 ethnic groups, with 60 of these living in voluntary isolation.[38]

Farmers and ranchers represent a very important and diverse group of the population, with a composition ranging from the descendants of the old settlers to new immigrants; from small land holders, including those who came in under the aegis of agrarian reform, to big land owners; and "ranchers" with a significant amount of land illegally or irregularly acquired.



Barra de São Manoel community, Tapajós river, Brazil

Table 2. Demographic profile of Amazon countries[39]

Country	Total population (x 1000)	Amazon population (x 1000)	Amazon population (% of total of the country)	Population density of Amazon (km^{-2})	Urban population in Amazon (%)	GDP per capita of Amazon Population ($US\$.yr^{-1}$)
Bolivia	8,274	1,234	15	2.5	37%	1,178
Brazil	190,733	23,797	12	4.7	80%	6,128
Colombia	42,889	1,211	3	2.5	43%	1,768
Ecuador	14,307	740	5	6.3	25%	6,081
Guyana	788	788	100	3.7	28%	2,660
French Guiana	213	213	100	2.5	81%	18,837
Peru	29,137	3,837	13	4.9	62%	2,353
Suriname	493	493	100	3.0	75%	4,396
Venezuela	29,834	1,793	6	3.9	75%	9,259
TOTAL	**316,668**	**34,106**	**11**	**4.5**	**65%**	**5,507**

3.2 Economy

The contribution of the Amazon to South America's economy is enormous and often underestimated. The region's abundance of natural resources is being exploited on an industrial scale. Oil and natural gas are mainstays of the economies of Bolivia (45% of total national exports), Ecuador (55%), and Peru (11%) and in these countries, principally extracted from the Amazon region. Hydropower sourced from the Amazon supplies a high percentage of national energy needs: 39% in Ecuador, 35% in Bolivia, 22% in Peru, and 11% in Brazil, and it is highly significant in terms of future potential. Thirty seven percent of Brazil's beef herd is in the Amazon and over 80% of all Brazilian beef is consumed domestically. Twenty four percent of Colombia's freshwater fish catch and 22% of Bolivia's rice comes from their Amazon regions.

Amazonian agricultural commodities and metals are exported at scale. Soybean grain and beef from Brazil's Legal Amazonia generated US$9 billion respectively in export revenues in 2012. Brazil's Pará state alone produces iron ore worth c. US$8.8 billion annually, gold production in the Madre de Dios region of Peru was worth US$1.3 billion in 2012. This demand is increasing as national and global populations grow larger and more affluent. Chinese demand in particular has driven the expansion of Amazonian soy in recent years, accounting for some 70% of Brazil's soybean exports in 2012.[40]

Although the conservation of Amazon ecosystems increasingly appears in governmental discourse, national economic planning aims at accelerated development in the region. For example, there are more than 400 dams at various project stages in the Amazon region.[41] In addition, Brazil plans to increase national soy exports by 39% and beef exports by 29% by 2021. Twenty one percent of Amazonia is under some form of mining exploitation or concession, and 14% under some form of oil exploitation or concession. Fifty seven international transport projects are planned in the Amazon region.[42,43,44] This export economy is dependent on Amazonia's ecosystem services **(Figure 2)**. Hydropower generation and agricultural commodity production rely directly on the region's abundant rainfall. Similarly mining, oil extraction and thermo-power generation all require abundant water. Today's industrialised Amazonian economy also depends on energy supply at scale.[45] The cities and growing industry (such as in Manaus) depend not only on the amount of water, but on its regular supply and purity.

The economic development in the Amazon region varies greatly among the countries. It is estimated that the Amazon regional GDP reaches US$330 billion dollars per year, of which the Brazil portion accounts for more than 70%. The average GDP per capita for the region is US$5,500 thousand dollars annually, but there is great variation between the countries. The lowest GDP per capita is that of Bolivia (US$1,200) and the highest are for French Guiana (US$18,800) and Venezuela (US$9,300). Although the GDP is considered the principal indicator for assessing the economic growth of a country or region, it does not reflect the quality of life for populations and social inequality.[46] While progress has been made in recent years to improve the standard of living in the region, on numerous indicators Amazonia's citizens remain poor. The stark reality is that the wealth created within Amazonia has enriched few Amazonians. Despite recent progress in tackling poverty, it remains widespread in the region. As many as 60% of people in the Bolivian Amazon, 37% in Ecuador, 23% in Peru and 17% in Brazil, are estimated to be living below the extreme poverty line.[47,48]

Morning atmosphere in a misty tropical forest at higher altitude, French Guiana

4.0 PROTECTED AREAS

"A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values."

– IUCN definition[49]

"[A protected area is] a geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives."

- Convention on Biological Diversity (Article 2)[50,i]

4.1 Importance of Protected Areas[ii]

PAs (*stricto sensu* or nature PAs) are at the core of every conservation effort, at any scale. This is particularly true when they are associated with international and national biodiversity protection targets. The most recognised definitions of PAs (IUCN, CDB) have nature conservation as their main objective.

Traditionally, PAs were designated to protect nature within them: endangered or endemic species, key habitats or outstanding natural landscapes. However, cultural values like traditional livelihoods, sacred sites and archaeological remains form important ingredients in most of the areas.[51] In addition, there is growing recognition of the role of these areas for life beyond the areas themselves: they provide critical ecosystem services for surrounding areas and human populations.[52,53] In the Amazon, one of the key roles of PAs is in the mitigation of climate change: they help to maintain forest cover, contributing to regional and global climate regulation[54,55,56] and store huge carbon stocks in live biomass.[57] They form a cornerstone of nature-based climate adaptation strategies.[58] Therefore, WWF considers that PAs (and other conservation mechanisms) are now more important than ever to support local livelihoods, national development and the global environment.

4.2 Socio-economic benefits of Amazon Protected Areas

The main value of Amazon PAs to global society, in addition to the protection of biodiversity, is the provision of ecosystem services, through water regulation, climate regulation and the provision of raw materials, sustaining an important and quickly developing economy in most of the Amazon Biome countries. For the population living in or directly associated with Amazon PAs, these areas are of direct economic importance. Harvesting of non-timber forest products and sustainable timber extraction are allowed in a regulated manner in many sustainable use areas. Tourism and research activities have resulted in significant employment opportunities in some high visitation areas like Canaima (Venezuela), Amacayacu (Colombia), Yasuní (Ecuador), Tambopata (Peru) and Madidi (Bolivia). This not only provides income for tour guides and

[i] The definition of protected area is based on the IUCN definition (Dudley, 2008), which is technically more widely accepted. However, governments tend to use the CBD definition. This report also considers subnational areas, but excludes private PAs, Community Conserved Areas and others not recognised by national systems.

[ii] Because of the nature conservation objective of PAs and for a clear distinction with indigenous territories (ITs), it makes sense to call these *stricto sensu* protected areas as 'nature protected areas'.

operators, but also for transport, food, lodging and other service providers in local communities and surrounding populations.

There are no direct studies of the contribution of Amazon PAs to the economy of their countries or how they relate to the Human Development Index.[59] However, in 2011 UNEP-WCMC completed a detailed study on the contribution of PAs to the Brazilian economy.[60] This research reported that an "ecological tax" to the value of R$ 400 million[i] (approximately US$240 million at the time) had been transferred to local governments. Also, PAs in Brazil hold as much as 2.8 billion tons of carbon, which could potentially generate R$ 100 billion, while income from visitation might reach R$ 2 billion in 2016, with current income from sustainable forest management (timber and non-timber) in extractive reserves generating a similar value.

Ensuring environmental sustainability, including the target of halting the loss of biodiversity by 2015, is one of the Millennium Development Goals (MDG) agreed to by all the world's countries and all the world's leading development institutions.[61] The Amazon Regional Articulation (ARA) analysed the progress of the Amazon towards the MDGs and noted a positive contribution through the significant increase in the number of legally recognised PAs and ITs.[62] However, they also emphasise that not all of the countries legally recognise the rights of indigenous and traditional peoples to those lands.

4.3 Evolution of the Network of Protected Areas in the Amazon[ii]

Some of the first PAs in the Amazon region were established by European governments through their colonies. Kaieteur National Park was created in 1929 in Guyana, then a British Colony, while Coppename Estuary Bird Sanctuary was founded in 1953 in the Dutch colony of Suriname. From the 1940s through to 1960s, PAs designation spread across to the independent South American countries, where they were established mostly with limited objectives, particularly to safeguard a specific feature, like mountains, falls or caves. During the sixties, only a few unique areas were granted protection, including the 3 million hectares Canaima National Park in Venezuela on the border with Brazil and Guyana, Cueva de los Guácharos National Park at the Andes-Amazon interface in Colombia and Isibore-Sécure National Park in Bolivia.

The area of the Amazon under protection increased slowly from 1960 until 1988 with relatively remarkable increases taking place in 1965, 1973-74 and 1978-79. During the 1970's there was a groundswell of public opinion in favour of conservation and sustainable development, at which point several medium to large PAs (250,000 - 500,000+ hectares or more) were declared, including Manu National Park (Peru), Yasuní National Park (Ecuador), Macarena and Amacayacu National Parks (Colombia), Noel Kempff Mercado National Park (Bolivia), Jaú and Amazonia National Parks (Brazil), as well as Pico da Neblina (Brazil) and the adjacent Serranía de la Neblina (Venezuela). The gazetting of large PAs in the Amazon was a trend that continued after 1970s.

The first really large expansion of national parks occurred in the mid-to-late 1980's and was linked to heightened national awareness regarding rising deforestation rates in the Amazon and a better understanding of the benefits PAs can contribute. By 1985, 60 areas of the current 400 had been created. Subsequently, from 1985-1990 Venezuela, Colombia and Brazil established large parks in the Amazon, which contributed to a solid increase in both area and number of PAs across the biome **(Figure 3 and 4)**.Even with the relative growth in the models for sustainable use reserves and a level of local community participation, the large areas were still primarily established with the goal of absolute protection and continued to lack extensive consultation processes or participatory governance.

[i] In 2011, the exchange rate of the Brazilian Real to US Dollar was approximately 1 R$ = 0.6 US$. In 2014 it is about 4 times that rate.

[ii] This report considers nature protected areas included in national systems, but not local or privately managed and voluntarily established areas. Furthermore, it does not consider non-recognised community conserved areas. For more information on the protected areas sources and database, including those considered in this report, see 'Appendix 2. Technical Supplement' in 'A2.2. Protected areas and ITs databases'.

Figure 3. Evolution of total area protected in the Amazon (1960 -2013)[63]

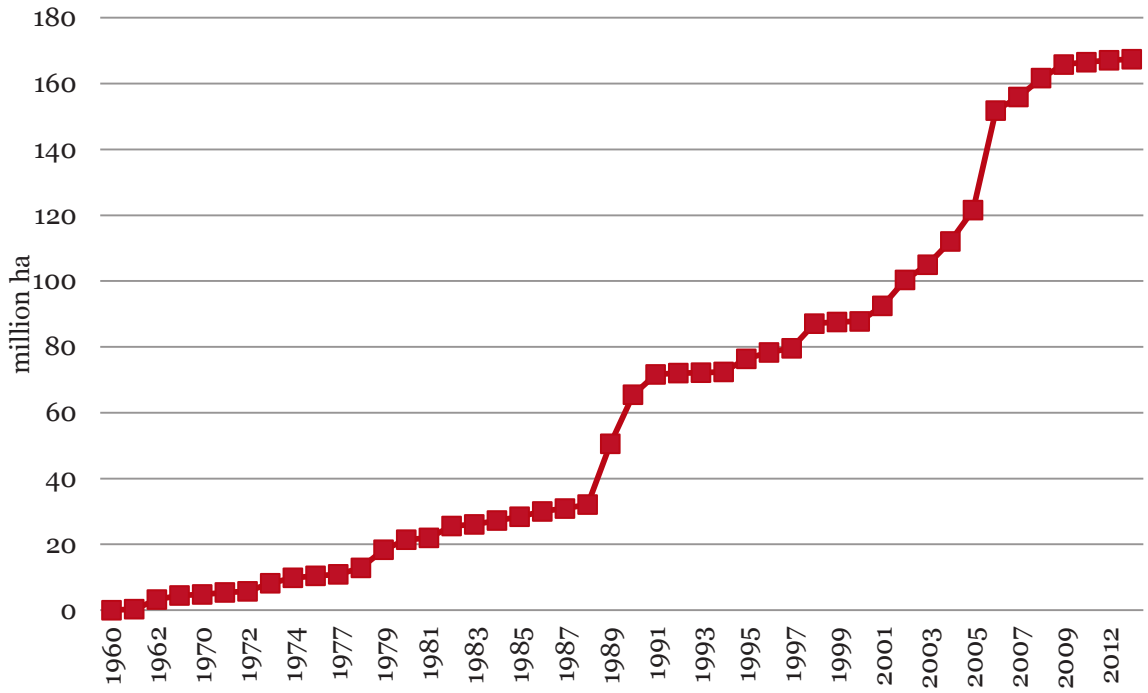
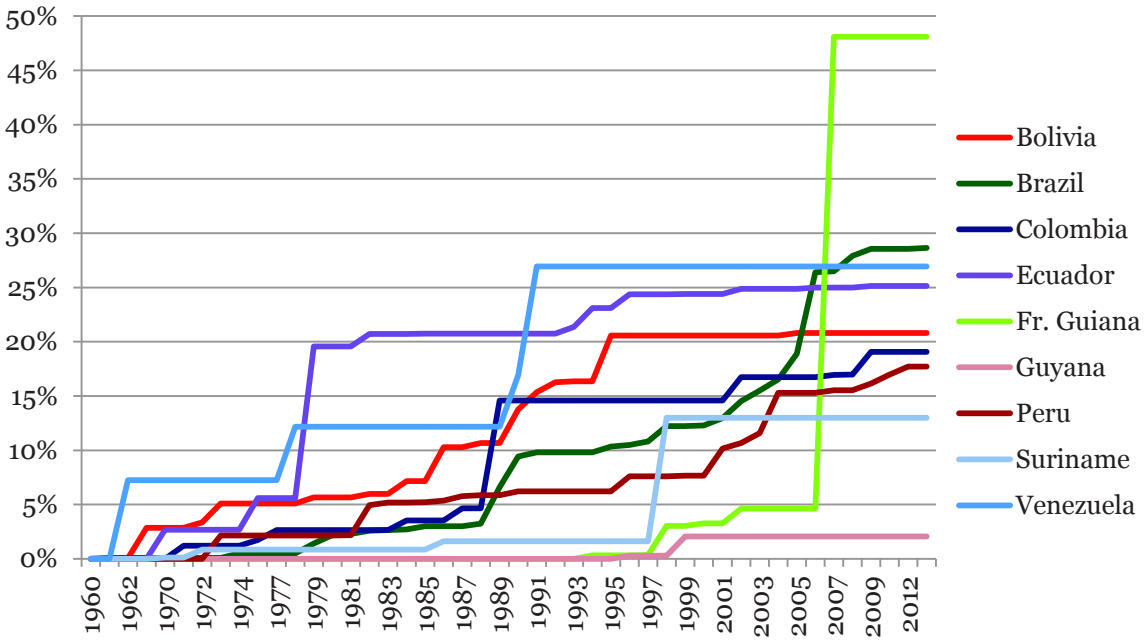


Figure 4. Evolution of the percentage of each country's share of the Amazon (1960-2013) [64]



Textbox 2. The Southern Amazon Mosaic

WWF-Brazil

"This instrument has tremendous potential for optimizing resources and creating shared and participative decision making processes, all contributing to managing the whole regional landscape in an integrated manner."
- Mauro Armelin, coordinator of WWF Brazil's Amazon Programme.

On August 25, 2011, Brazilian Minister of the Environment Izabella Teixeira signed the official document establishing the Southern Amazon Mosaic, a total land area of 7 million hectares, similar to the size of Ireland. A grouping of 40 neighbouring PAs in the states of Rondonia, Mato Grosso and Amazonas, the mosaic consolidates protected area management in a bid to improve the conservation of ecosystems, biodiversity and the living conditions of local populations.

One important aspect to ensure that mosaic management is participative is the creation of a consultative council. The council proposes directives governing land use and settlement, access, surveillance and inspection, scientific research, and the use of natural resources in the PAs composing the mosaic. Membership of the council is formed of protected area managers, representatives of the respective state governments, non-governmental organisations working in the socio-environmental sector, local social movements and businesses and regional indigenous populations.

WWF Brazil provided important direct support to the studies that provided essential input for the creation of the mosaic and it also organised and facilitated many discussions and workshops among the communities in the region. Another achievement was the staging of a side event at the Conference of the Parties to the Convention on Biological Diversity (COP-10) that took place in Japan in October 2010. The event sought to call attention to the socio-environmental importance of the Southern Amazon Mosaic and generate future support for the mosaic initiative.

Aerial view of the Amazon Rainforest, near Manaus, the capital of the Brazilian state of Amazonas

International conventions and related conferences and meetings were the next big triggers for the establishment of PAs, specifically the Convention on Biological Diversity (1992), the United Nations Conference on Environment and Development (Rio, 1992) and the World Parks Congress in Caracas in 1992. Holding important events in the region helped to promote the creation of new PAs in Amazon. Under CBD, all countries committed to establish national protected area systems for the protection of ecosystems and natural habitats. Among the Amazon countries, only Suriname has not fulfilled the CBD agreement to date, while the other countries have instituted legal frameworks supporting protection and defined categories with different degrees of protection.[65]

The CBD Programme of Work on PAs (PoWPA) introduced in 2004 established a clear strategy and reporting mechanism, which was accompanied by a considerable increase in PAs. The Latin American congresses on National Parks and other PAs (1997, Santa Marta, Colombia and 2007, Bariloche, Argentina) were also instrumental triggers in new protected area creation.[66]

In the first decade of the 21st Century there was another strong increase in protected area creation in the Amazon, principally thanks to new areas in Brazil, including the "Calha Norte" in Pará (Grão-Pará Ecological Station, Pacu and Trombetas State Forests), Terra do Meio National Park (Pará) and Tumucumaque Mountains National Park (Amapá), each of them over 3 million hectares. The increase in surface area became more significant than the increase in number of areas created. Some of these new reserves were designated as part of informal PA 'mosaics' that had become best practice in the 2000s.

Mosaics are groups of PAs and other land use definitions brought together to optimise their management, as well as upscale or upgrade the conservation objectives and achievements within them. In some cases they can be part of the legal framework and be defined in advance, before the respective PAs are created, but in most cases they are still an unofficial grouping. Some mosaics are particularly significant for the Amazon because of their high level of conservation ambition, large scale, number of PAs and ITs, remoteness, and relative low level management conditions. Examples include:

- In 2004, Peru accomplished a significant mosaic, in the "Alto Purus", which also acknowledged protection for the area's indigenous peoples, including some peoples living in voluntary isolation. Now known as the Purus-Manu conservation corridor, the mosaic encompasses some 10 million hectares in the Peruvian Amazon and incorporates previously existing PAs;
- In 2006, the Juruena and "Campos Amazônicos" National Parks in Brazil combined with the Apuí State mosaic (Amazonas State) and a series of other PAs, to form the larger Southern Amazon mosaic with more than 7 million hectares **(Textbox 2)**;
- In 2005-06, Brazil advanced significantly to achieve the crucial "Terra do Meio" mosaic in Pará. Spanning more than 11 million hectares, this vast expanse merged together a larger group of PAs to form a buffer that limited damage caused by the ongoing development of the BR-163 highway. This landmark mosaic links the region's ITs (including the first indigenous reserve created in the 1960s), complementing the conservation of a much greater area some 25 million hectares in size that covers a substantial portion of the Xingu river basin in north Brazil;
- A considerable achievement was the creation of the "Calha Norte" state mosaic of Pará State, Brazil, in 2006. With some 30 million hectares, the park complemented important and large pre-existing PAs in addition to connecting PAs in neighbouring countries. In its entirety, the park protects a significant part of the Guiana Shield, likely to become the largest pristine tropical rainforest remaining over the longer term;
- In 2008-09, complementary actions were taken by the Federal and Amazonas State governments in Brazil to mitigate possible impacts from the revival of the BR-319 highway. The resulting mosaic spanned 8.4 million hectares and incorporated several newly-created PAs and integrated a number of pre-existing ones.[i]
- The exciting designation in 2012 of the world's largest Ramsar site (6.9 milllion ha), the Llanos de Moxos complex in the Bolivian Amazon (Beni), was partly a result of the successful governance and management model developed in the Itenez Departmental Park, an integral part of the Ramsar site **(Textbox 3)**.

[i] A significant part of those mosaics were born already linked to ARPA, the Brazilian Amazon PAs programme, several of them also counted on support from WWF, CI, ISA, ICV, Greenpeace and others, for their creation and implementation.

Textbox 3. Sub-national PAs: The case of Itenez Departmental Park in Bolivia

Hannah Beardon, WWF-US

Since the mid-1990s, Bolivia has been a leader in promoting participatory governance of PAs and recognition of the rights of indigenous and local peoples to engage in the management of their natural resources. Since 2005, under the government of Evo Morales, Bolivia has undergone dramatic political and social changes, including the consolidation of indigenous and peasant rights as well as the approval of the Law of Mother Earth, which grants rights to nature and biodiversity. Those who were historically marginalized in Bolivia now control the political system and have been radically empowered under the Morales government.

The Bolivian national protected area system spans 22 national PAs and 27 sub-national PAs including the Itenez Departmental Park in Beni, which covers an area of 1,389,025 hectares. This park comprises an enormous diversity of life with 490 plant species, 717 species of fauna, including an endemic species of river dolphin (Inia boliviensis). Within the national protected area system, the Itenez is of particular importance because it incorporating well-conserved areas of Beni savannah ecosystems, not protected by any of the national PAs. With support from the Moore Foundation, WWF Bolivia has been working in the Itenez for the past 10 years.

In February 2012, the Bolivian government created the Llanos de Moxos Ramsar complex in the Beni, the largest of its kind in the world with an area 6.9 million hectares in size. The successful consolidation of the governance and management of the Itenez Park, part of the site, was one of the key factors that made it possible to establish the Ramsar complex. This demonstrates how long term investment in PAs management can produce scaling and much larger conservation outcomes that benefit the sustainability of the Amazon as a whole.

Rainforest, Beni, Bolivia

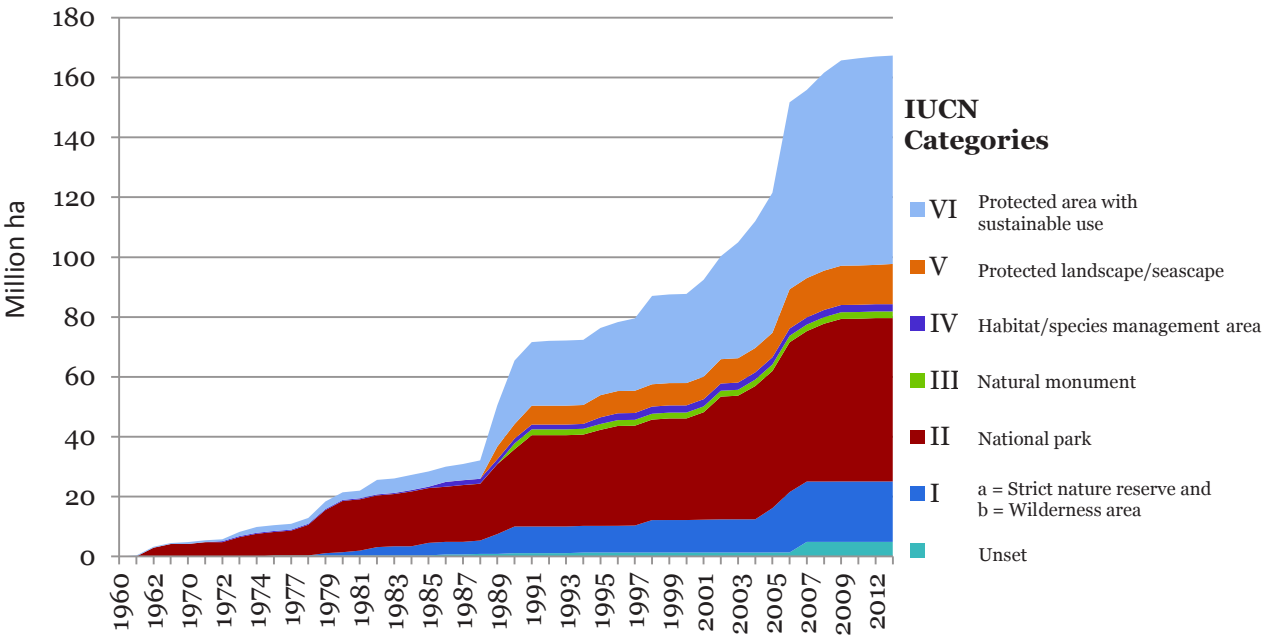
The most spectacular example of the contribution of a single initiative to increase protected area coverage is the Brazilian Amazon PAs Programme (ARPA). This initiative created the right conditions for the Brazilian National and State governments to create new PAs – besides making a strong contribution to protected area consolidation and improved management **(Textbox 4)**. In 2001, 17 PAs were created, 15 of them in Brazil (some part of ARPA) and the remaining two in Peru. In 2002, 20 PAs were created, 14 of them in Brazil –including the symbolic "Montanhas do Tumucumaque" National Park, two in Colombia, two in Bolivia, with one in French Guiana and the final one in Ecuador. In those two years an astonishing 12,245,698.28 hectares came under protection, an area the size of North Korea.

The most impressive 'jumps' in the history of Amazon protected area creation, include French Guiana, which achieved a high level of conservation due to the creation in 2007 of the "Parc Amazonien de Guyane". Ecuador jumped from 5% protected area coverage to 19% in one year, with the creation of Yasuní National Park and Cuyabeno Fauna Production Reserve in 1979. The Central Suriname Nature Reserve, created in 1998, accelerated this country from 2% to 13%. Colombia jumped from 5% to 15% with the creation of the Chiribiquete National Park and Puinawai National Nature Reserve and another two in 1989. Venezuela went from 12% in 1989 to 27% in 1991 – just before the World PAs Congress in 1992 in Caracas, including the large Parima-Tapirapecó National Park in 1991, in addition to 18 other PAs in 1989. Brazil went from 11% in 2000 to 27% in 2010.

In absolute numbers, Brazil has created the most new PAs in the last decade, thanks to strong initiatives by the Federal and State governments, particularly linked to large mosaics (such as the ones mentioned above) and the ARPA programme. The country was responsible for 86% of the global increase in PAs between 2003 and 2009.[67] The Amazon represented almost 50% of the global increase in terrestrial PAs in the decade (2000-10).[68]

The development over time of the creation of PAs in accordance with IUCN's PAs Management Categories **(Figure 5)** shows a policy shift in the focus from more strict preservation in the 1980's (when almost 80% of PAs were strict preservation areas) to one of sustainable use during the last decade (now approximately 60% of all PAs).

Figure 5. Total area protected accumulated in the Amazon per (IUCN) international category (1960-2013)[69]



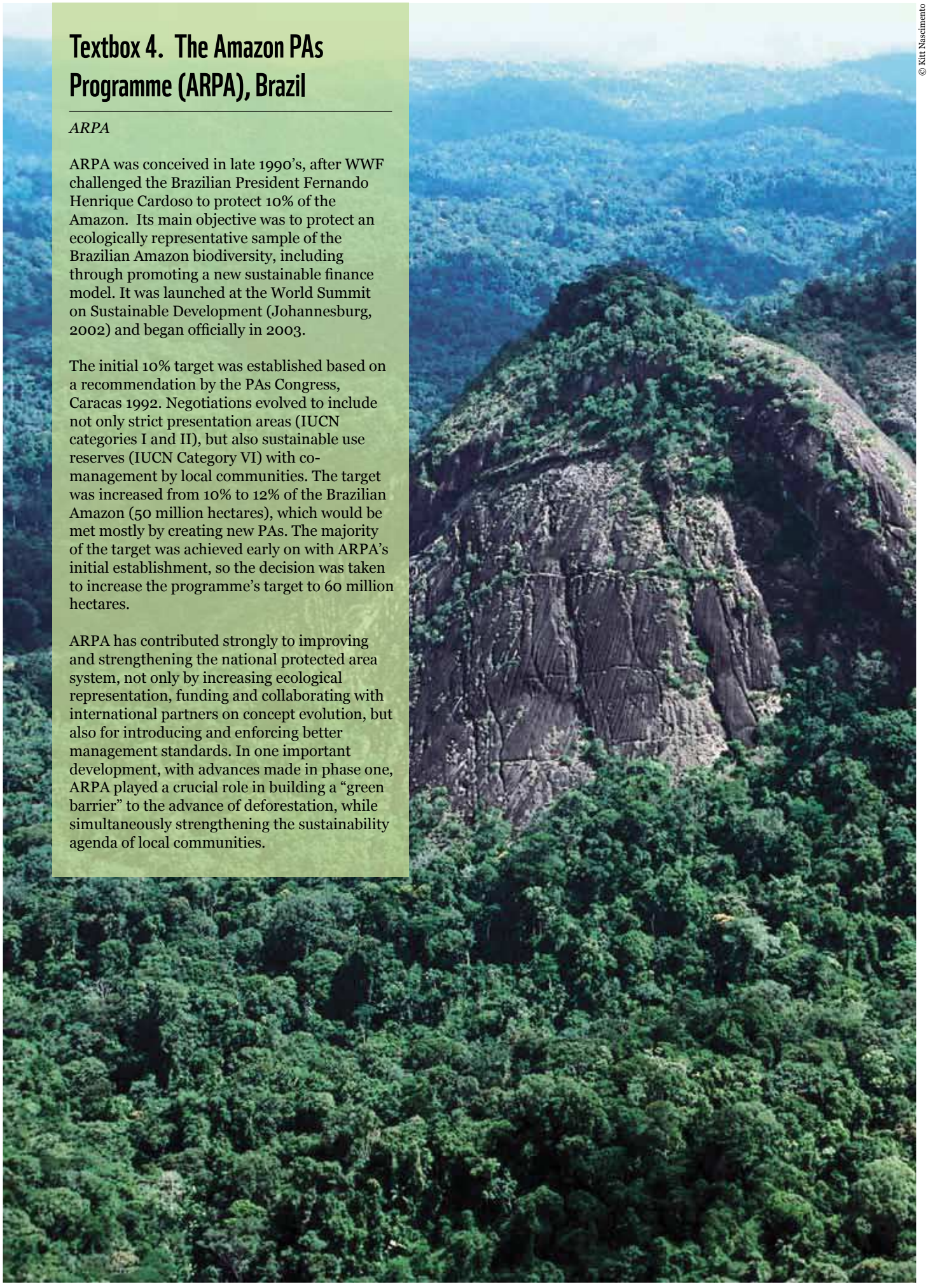
Textbox 4. The Amazon PAs Programme (ARPA), Brazil

ARPA

ARPA was conceived in late 1990's, after WWF challenged the Brazilian President Fernando Henrique Cardoso to protect 10% of the Amazon. Its main objective was to protect an ecologically representative sample of the Brazilian Amazon biodiversity, including through promoting a new sustainable finance model. It was launched at the World Summit on Sustainable Development (Johannesburg, 2002) and began officially in 2003.

The initial 10% target was established based on a recommendation by the PAs Congress, Caracas 1992. Negotiations evolved to include not only strict presentation areas (IUCN categories I and II), but also sustainable use reserves (IUCN Category VI) with co-management by local communities. The target was increased from 10% to 12% of the Brazilian Amazon (50 million hectares), which would be met mostly by creating new PAs. The majority of the target was achieved early on with ARPA's initial establishment, so the decision was taken to increase the programme's target to 60 million hectares.

ARPA has contributed strongly to improving and strengthening the national protected area system, not only by increasing ecological representation, funding and collaborating with international partners on concept evolution, but also for introducing and enforcing better management standards. In one important development, with advances made in phase one, ARPA played a crucial role in building a "green barrier" to the advance of deforestation, while simultaneously strengthening the sustainability agenda of local communities.



Tumucumaque National Park, Brazil

4.4 Current status

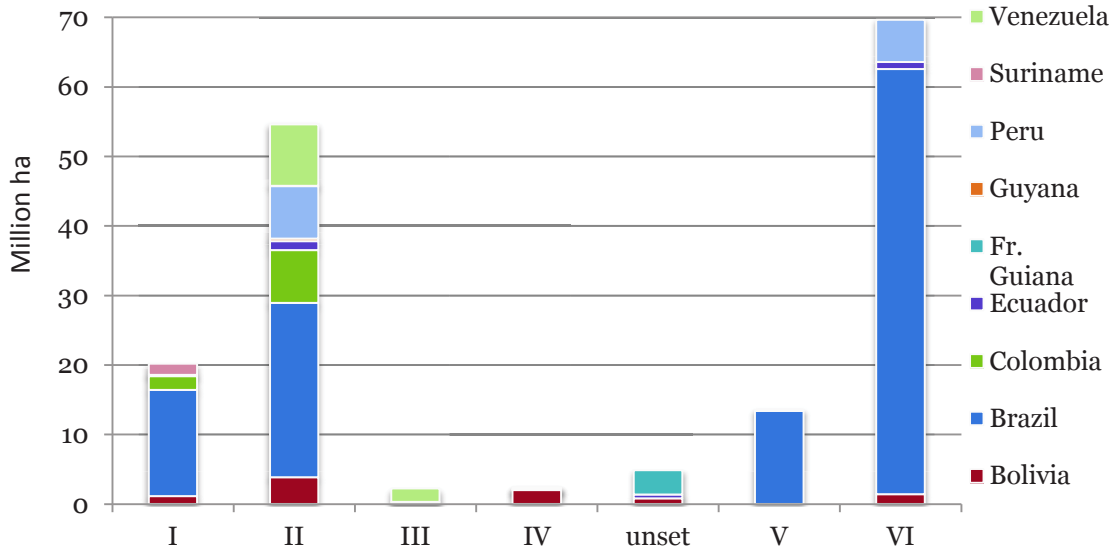
By 2013 the amount of the Amazon under protection was highly significant, with 390 PAs, representing 25% of the Amazon biome, and totalling some 167 million hectares. The number and total area encompassed by PAs in the Brazilian Amazon are impressive, and much larger than the other countries that share the rainforest. However, to put this into context, Brazil possesses 60% of the Amazon, so one might expect the number of protection areas and total area under protection to reflect this reality. To date, there are considerable differences in the percentage of Amazon territory that each country has included in PAs. For example, while Guyana only has 2.1% of its Amazon biome included in its national PAs system[i], French Guiana has almost half of its territory under protection **(Table 3)**.

Table 3. Total number, area and percentage of PAs in the Amazon (1960- 2013)[70]

	number of PAs in each country's share of the Amazon		total area under protection (ha) in the Amazon		percent of each country's share of the Amazon under protection
Bolivia	23	5.9%	9,172,711.47	5.5%	20.8%
Brazil	255	65.4%	114,939,614.87	68.7%	28.6%
Colombia	18	4.6%	9,557,906.07	5.7%	19.1%
Ecuador	14	3.6%	2,876,323.37	1.7%	25.1%
French Guiana	11	2.8%	3,904,464.35	2.3%	48.1%
Guyana[ii]	2	0.5%	434,139.11	0.3%	2.1%
Peru	34	8.7%	13,951,892.57	8.3%	17.7%
Suriname	8	2.1%	1,827,988.27	1.1%	13.0%
Venezuela	25	6.4%	10,750,081.22	6.4%	26.9%
total	390	100.0%	167,415,121.30	100.0%	25.0%

Variations also exist between countries in terms of IUCN's PAs Management Categories. Brazil, in recent years, has had a clear prevalence of Category VI reserves, both in number and in total area. There are several categories in the national legislation corresponding to IUCN Category VI, which comprises two clear distinct groups: (i) PAs with some level of co-management by local communities (more important for social and conservation purposes); and (ii) PAs with sustainable forest management objectives. In terms of area, the majority of Peru's parks are Category II, followed closely by Category VI **(Figure 6; Table 4)**.

Figure 6. International categories of PAs (IUCN) in the Amazon (1960-2013)[71]



[i] After the conclusion of the analyses related to this report an important omission was identified: Kanuku Mountains Managed Resource Use Area (category VI) designated in Guyana in 2001 with the significant area of some 610 thousand hectares, which would almost double the percentage of the coverage in Guyana.

[ii] See previous note.

Textbox 5. Transboundary triumph: Putumayo River Basin

WWF Colombia

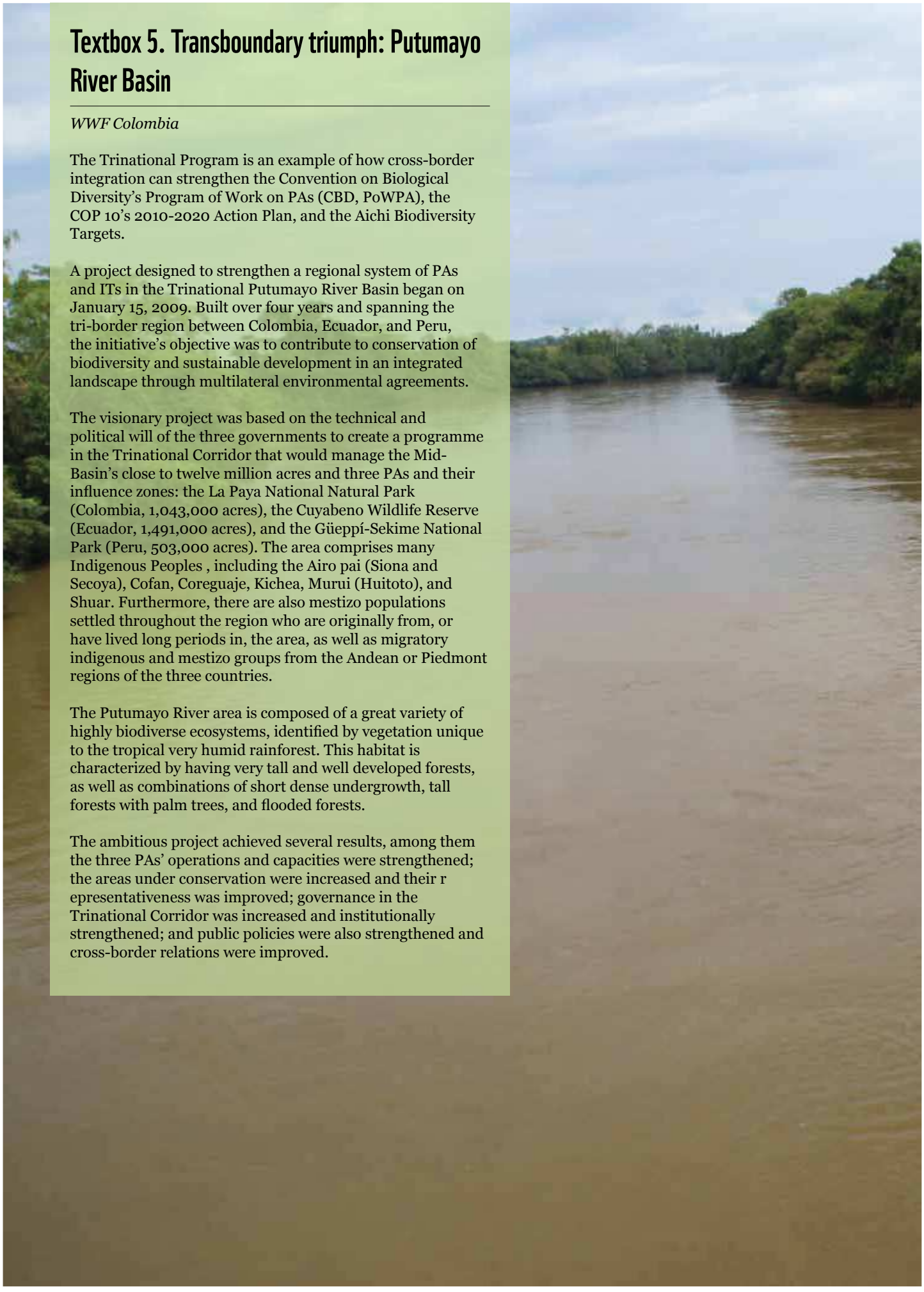
The Trinational Program is an example of how cross-border integration can strengthen the Convention on Biological Diversity's Program of Work on PAs (CBD, PoWPA), the COP 10's 2010-2020 Action Plan, and the Aichi Biodiversity Targets.

A project designed to strengthen a regional system of PAs and ITs in the Trinational Putumayo River Basin began on January 15, 2009. Built over four years and spanning the tri-border region between Colombia, Ecuador, and Peru, the initiative's objective was to contribute to conservation of biodiversity and sustainable development in an integrated landscape through multilateral environmental agreements.

The visionary project was based on the technical and political will of the three governments to create a programme in the Trinational Corridor that would manage the Mid-Basin's close to twelve million acres and three PAs and their influence zones: the La Paya National Natural Park (Colombia, 1,043,000 acres), the Cuyabeno Wildlife Reserve (Ecuador, 1,491,000 acres), and the Güeppí-Sekime National Park (Peru, 503,000 acres). The area comprises many Indigenous Peoples , including the Airo pai (Siona and Secoya), Cofan, Coreguaje, Kichea, Murui (Huitoto), and Shuar. Furthermore, there are also mestizo populations settled throughout the region who are originally from, or have lived long periods in, the area, as well as migratory indigenous and mestizo groups from the Andean or Piedmont regions of the three countries.

The Putumayo River area is composed of a great variety of highly biodiverse ecosystems, identified by vegetation unique to the tropical very humid rainforest. This habitat is characterized by having very tall and well developed forests, as well as combinations of short dense undergrowth, tall forests with palm trees, and flooded forests.

The ambitious project achieved several results, among them the three PAs' operations and capacities were strengthened; the areas under conservation were increased and their r epresentativeness was improved; governance in the Trinational Corridor was increased and institutionally strengthened; and public policies were also strengthened and cross-border relations were improved.



Putumayo River Basin, Colombia

Table 4. International categories of PAs (IUCN) in the Amazon (1960-2013)[72]

	I (probably only Ia)		II		III		IV	
	No.	**total area**	**No.**	**total area**	**No.**	**total area**	**No.**	**total area**
Bolivia	1	1,123,036.69	6	3,850,956.57			4	1,989,098.58
Brazil	36	15,273,780.23	38	25,096,210.66			1	6,287.17
Colombia	2	1,980,975.95	15	7,566,785.51			1	10,144.61
Ecuador			5	1,306,192.54				
Fr. Guiana	2	216,811.27			1	17.839,02	5	140,804.85
Guyana			1	371,019.60			1	63,119.51
Peru			10	7,553,132.17	5	301.484,45		
Suriname	1	1,601,147.96	1	14,413.97			6	212,426.34
Venezuela			6	8,836,690.18	19	1.913.391,03		
total	42	20,195,752.11	82	54,595,401.21	25	2.232.714,50	18	2,421,881.06
	V		**VI**				**no (not assigned)**	
	No.	**total area**	**No.**	**total area**			**No.**	**total area**
Bolivia			5	1,416,012.82			7	793,606.81
Brazil	26	13,427,325.32	154	61,136,011.49				
Colombia								
Ecuador			4	1,017,948.26			5	552,182.56
Fr. Guiana							3	3,529,009.21
Guyana								
Peru	1	22,390.22	18	6,074,885.74				
Suriname								
Venezuela								
total	27	13,449,715.53	181	69,644,858.31			15	4,874,798.58

Bolivia has almost half of its PAs assigned as Category II, while having a clear majority of the total area protected by Category IV. Venezuela has a high proportion of its reserves aligned to category II by area, but Category III in number. Colombia has its PAs strongly concentrated in Category II, both in total area and in number, followed far behind by Category I. Although French Guiana appears to have a majority of PAs non-assigned, the significant establishment of the "Parc Amazonien de Guyane", means in reality that an important area is protected under Category II. Ecuador also has a prevalence of Category II, but followed closely Category VI. In terms of area, in Suriname there is a strong majority of Category I reserves due to the weight of the Central Suriname Reserve, but in numbers of PAs the majority is of Category IV.

Despite the expansion of protected areas in the Amazon, collectively they do not ensure adequate ecosystem representativeness nor are the national systems they comprise sufficiently well-connected with each other. Furthermore, while several countries (Brazil, Bolivia, Venezuela and Ecuador included) have between 20 and 30% of their Amazon biome in PAs, others (Colombia, Peru and Suriname) have between 10 and 20% protected.

It is evident from the current status of PAs, that there have been two important tendencies in the evolution of protected area management: (i) greater attention given to groupings of PAs, both in geographical and management terms, such as corridors, mosaics, and systems (more understanding is still needed on the complete functioning[i] of systems of PAs and on their integration into national and regional development and land-use plans); and (ii) a more inclusive approach by governments and the conservation movement, as well as the appropriation of conservation interests and mechanisms by local communities and indigenous peoples . An example of this is the development of CCAs from around 2002.

Particularly since the 1992 UN Conference on Environment and Development (Rio Summit), international and national approaches to conservation have increasingly been harmonised with social needs and the development agenda. As a result, the perception of the role of a protected area has evolved. The aims of PAs now include the sustainable use of natural resources, the preservation of ecosystem services and their integration with broader social development processes, as well as the core role of biodiversity conservation. More attention is now given to respecting cultural values (made explicit in the 1994 IUCN definition of a protected area) and to involving indigenous and local communities in management

[i] PAs systems are more than a collection of PAs, or a piece of legislation or a governmental policy; a fully functioning PA system is about complementarity, and involves training and exchange programmes, and interactions with other government sectors and policies (land use planning, infrastructure, energy planning, tourism, science, local communities' development, etc.) that lead to integrating PA systems into the wider development processes.

Textbox 6. Completing the jigsaw – the South Suriname Conservation Corridor

Mark Wright and Laurens Gomes, WWF Guianas

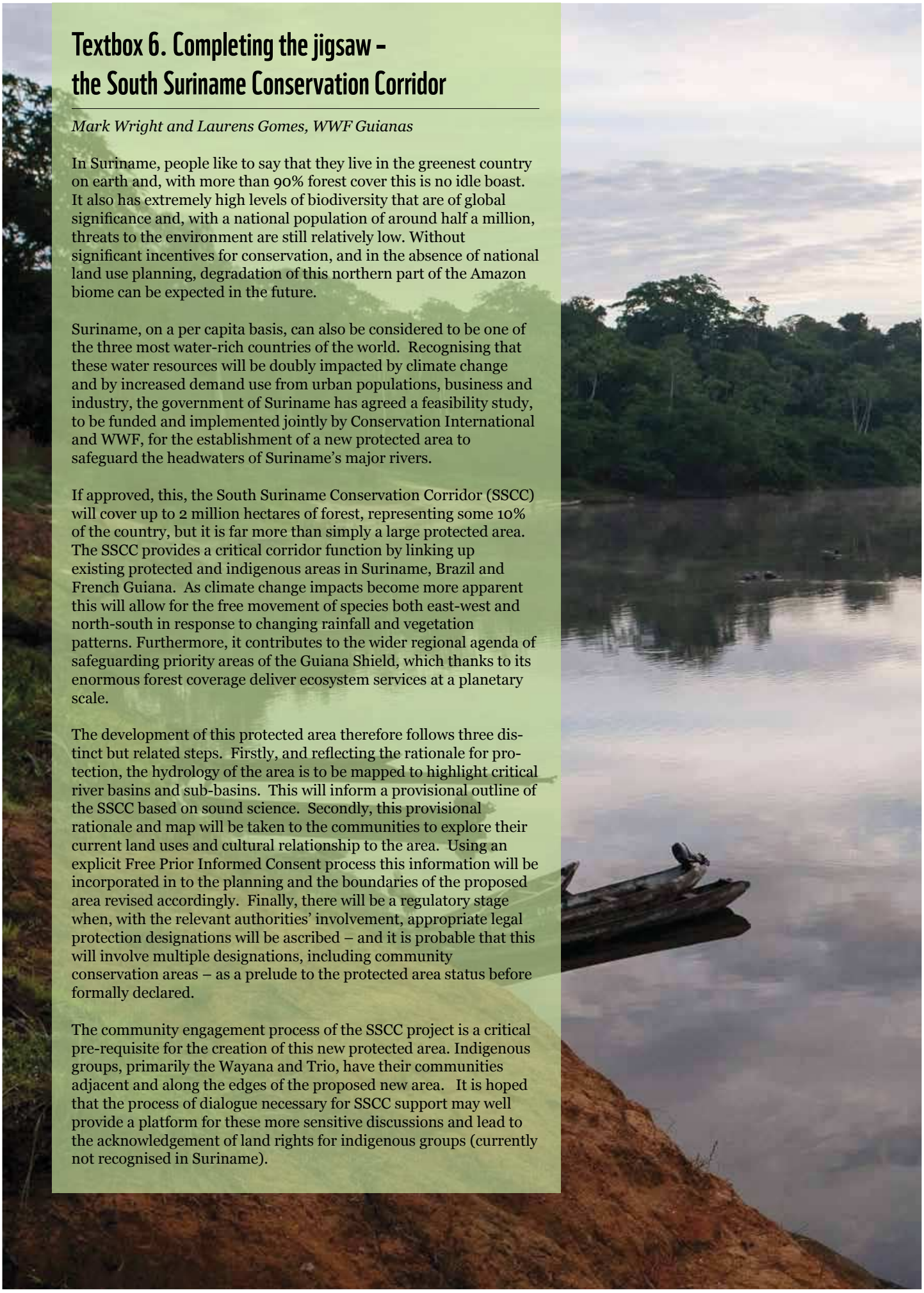
In Suriname, people like to say that they live in the greenest country on earth and, with more than 90% forest cover this is no idle boast. It also has extremely high levels of biodiversity that are of global significance and, with a national population of around half a million, threats to the environment are still relatively low. Without significant incentives for conservation, and in the absence of national land use planning, degradation of this northern part of the Amazon biome can be expected in the future.

Suriname, on a per capita basis, can also be considered to be one of the three most water-rich countries of the world. Recognising that these water resources will be doubly impacted by climate change and by increased demand use from urban populations, business and industry, the government of Suriname has agreed a feasibility study, to be funded and implemented jointly by Conservation International and WWF, for the establishment of a new protected area to safeguard the headwaters of Suriname's major rivers.

If approved, this, the South Suriname Conservation Corridor (SSCC) will cover up to 2 million hectares of forest, representing some 10% of the country, but it is far more than simply a large protected area. The SSCC provides a critical corridor function by linking up existing protected and indigenous areas in Suriname, Brazil and French Guiana. As climate change impacts become more apparent this will allow for the free movement of species both east-west and north-south in response to changing rainfall and vegetation patterns. Furthermore, it contributes to the wider regional agenda of safeguarding priority areas of the Guiana Shield, which thanks to its enormous forest coverage deliver ecosystem services at a planetary scale.

The development of this protected area therefore follows three distinct but related steps. Firstly, and reflecting the rationale for protection, the hydrology of the area is to be mapped to highlight critical river basins and sub-basins. This will inform a provisional outline of the SSCC based on sound science. Secondly, this provisional rationale and map will be taken to the communities to explore their current land uses and cultural relationship to the area. Using an explicit Free Prior Informed Consent process this information will be incorporated in to the planning and the boundaries of the proposed area revised accordingly. Finally, there will be a regulatory stage when, with the relevant authorities' involvement, appropriate legal protection designations will be ascribed – and it is probable that this will involve multiple designations, including community conservation areas – as a prelude to the protected area status before formally declared.

The community engagement process of the SSCC project is a critical pre-requisite for the creation of this new protected area. Indigenous groups, primarily the Wayana and Trio, have their communities adjacent and along the edges of the proposed new area. It is hoped that the process of dialogue necessary for SSCC support may well provide a platform for these more sensitive discussions and lead to the acknowledgement of land rights for indigenous groups (currently not recognised in Suriname).



Kwamalasamutu is a Tiriyó Indian village in southern Suriname

decisions affecting them. Starting from the original focus on "nature" that marginalised many indigenous people, today a greater number of PA professionals recognise natural resources, people and cultures as fundamentally interlinked.[73,74,75,76]

There are already initial actions of regional integration of the Amazon network of PAs, for example through the development of an Amazon Ecosystem-based Conservation Vision that addresses conservation gaps, management effectiveness, financial sustainability and local community participation, as well as the roles and safeguards of PAs in climate change mitigation and adaptation[i].

There are a few good examples of transboundary PAs in the Amazon region, such as the tri-national cooperation between Colombia, Peru and Ecuador in the Putumayo basin **(Textbox 5)**

However, many more could and should be developed. Indeed, some important Transboundary PAs are currently in development, such as the South Suriname Conservation Corridor **(Textbox 6)** and the Kutuku corridor in Ecuador **(Textbox 7)**.

Transboundary PAs can even include cases of bi or multilateral co-management, although in the past they have involved PAs that are located close to the border with integration of sub-regional exchange and management programmes.[ii 77] Transboundary areas are much more than areas close to the borders; the regional integration of contiguous PAs should be based on ecologically-based and thematically-linked networks of PAs (such as those that protect migratory fish, or have an integrated ecotourism programme, or have a collaborative programme between different research bases, etc.).

[i] See the project Building Resilience in the Amazon Biome, by WWF on behalf of RedParques.

[ii] Transboundary protected areas have an agreed set of 'good practice guidelines', such as: identifying and promoting common values; involving and benefiting local people; obtaining and maintaining support of decision makers; promoting coordinated and cooperative activities; achieving coordinated planning and protected area development; developing cooperative agreements; working toward funding sustainability; monitoring and assessing progress; and dealing with tension or armed conflict (according to guidelines produced by the World Commission on Protected Areas – WCPA in 2001.)

Textbox 7. Kutukú: An area to discover

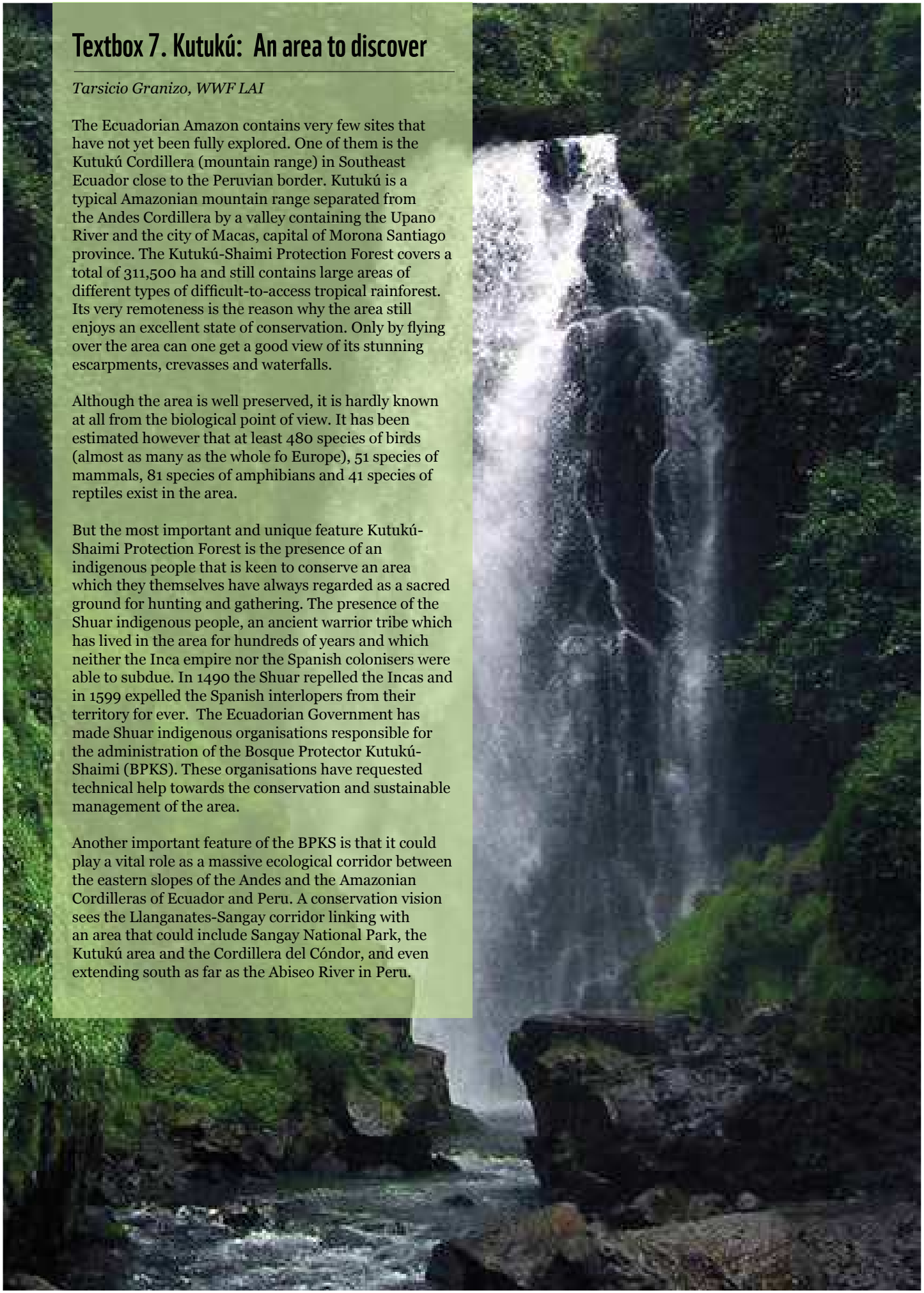
Tarsicio Granizo, WWF LAI

The Ecuadorian Amazon contains very few sites that have not yet been fully explored. One of them is the Kutukú Cordillera (mountain range) in Southeast Ecuador close to the Peruvian border. Kutukú is a typical Amazonian mountain range separated from the Andes Cordillera by a valley containing the Upano River and the city of Macas, capital of Morona Santiago province. The Kutukú-Shaimi Protection Forest covers a total of 311,500 ha and still contains large areas of different types of difficult-to-access tropical rainforest. Its very remoteness is the reason why the area still enjoys an excellent state of conservation. Only by flying over the area can one get a good view of its stunning escarpments, crevasses and waterfalls.

Although the area is well preserved, it is hardly known at all from the biological point of view. It has been estimated however that at least 480 species of birds (almost as many as the whole fo Europe), 51 species of mammals, 81 species of amphibians and 41 species of reptiles exist in the area.

But the most important and unique feature Kutukú-Shaimi Protection Forest is the presence of an indigenous people that is keen to conserve an area which they themselves have always regarded as a sacred ground for hunting and gathering. The presence of the Shuar indigenous people, an ancient warrior tribe which has lived in the area for hundreds of years and which neither the Inca empire nor the Spanish colonisers were able to subdue. In 1490 the Shuar repelled the Incas and in 1599 expelled the Spanish interlopers from their territory for ever. The Ecuadorian Government has made Shuar indigenous organisations responsible for the administration of the Bosque Protector Kutukú-Shaimi (BPKS). These organisations have requested technical help towards the conservation and sustainable management of the area.

Another important feature of the BPKS is that it could play a vital role as a massive ecological corridor between the eastern slopes of the Andes and the Amazonian Cordilleras of Ecuador and Peru. A conservation vision sees the Llanganates-Sangay corridor linking with an area that could include Sangay National Park, the Kutukú area and the Cordillera del Cóndor, and even extending south as far as the Abiseo River in Peru.

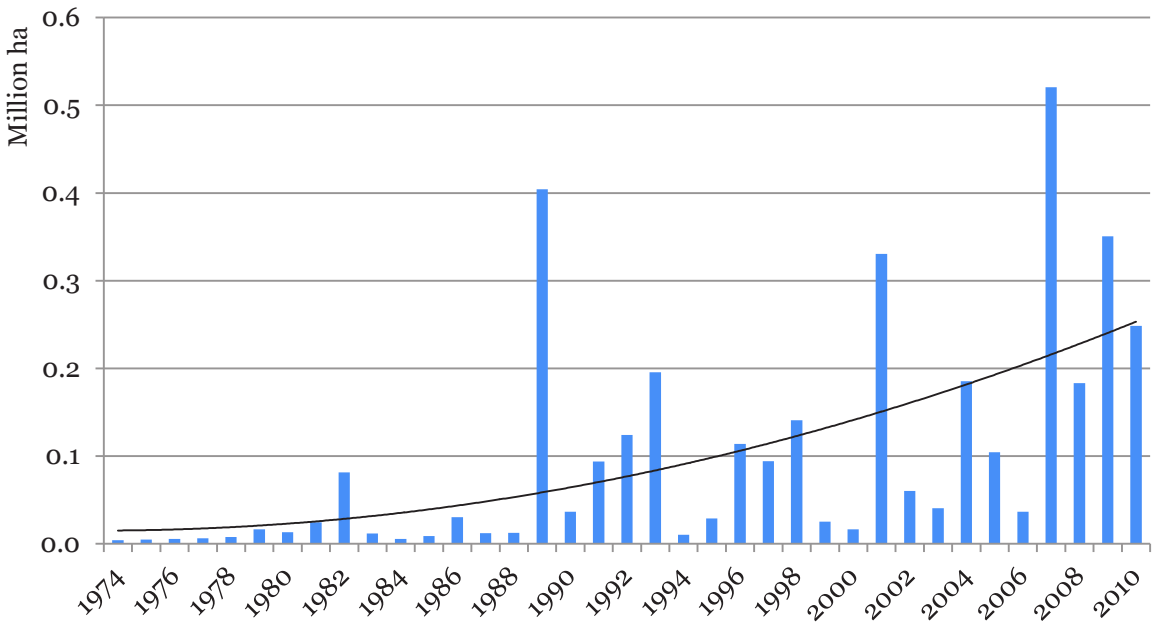


Spectacular waterfall, Ecuador

5.0 THE ROLE OF INDIGENOUS TERRITORIES

IPs and local communities have long been interacting with nature in the Amazon, with minimum impacts and many benefits. The Amazon is one of the best conserved natural regions on Earth, with large nature PAs and important mosaics. Indigenous territories have also played an important role[i].

Figure 7. Evolution of the average size of Amazon ITs (2010)[78]



In 2010 there were 3,043 ITs and similar areas within the Amazon Biome, although not all of them officially recognised, with a total of almost 208 million hectares[ii]. These areas represent 31.1% of the Amazon. Although Peru had the largest number of individual areas (many not yet fully defined), Brazil had the largest total surface area. Nevertheless, it is Venezuela, followed by Ecuador and Colombia which have major parts of their share of the Amazon designated as ITs **(Figure 8 and 9; Table 5)**[79]. Although it was not possible to define precisely the date of creation of almost a third of the ITs, it was possible to identify some tendencies over time. With marked oscillations, their average size has steadily grown in the last 35 years **(Figure 7)**. The growth in total area of ITs stabilised around the second half of the 1990's, and has likely started to decline in the last decade.

[i] This also applies to other local traditional communities (not covered by this report). The Amazon is home to one of most successful types of category VI areas (the "extractive reserves" in Brazil), an example of how important the participation and co-management by local communities is for Amazon PAs.

[ii] As there are marked differences in the legal and recognition procedures for ITs across countries, and different approaches are followed by IPs, governments and others organisations, and considering the high number of ITs and diversity of IPs, and the communication challenges of engaging with some groups, it is almost impossible to present a consistent summary of the status of ITs in the Amazon.

Figure 8. Cumulative growth of total area of Amazon ITs (2010)[80]

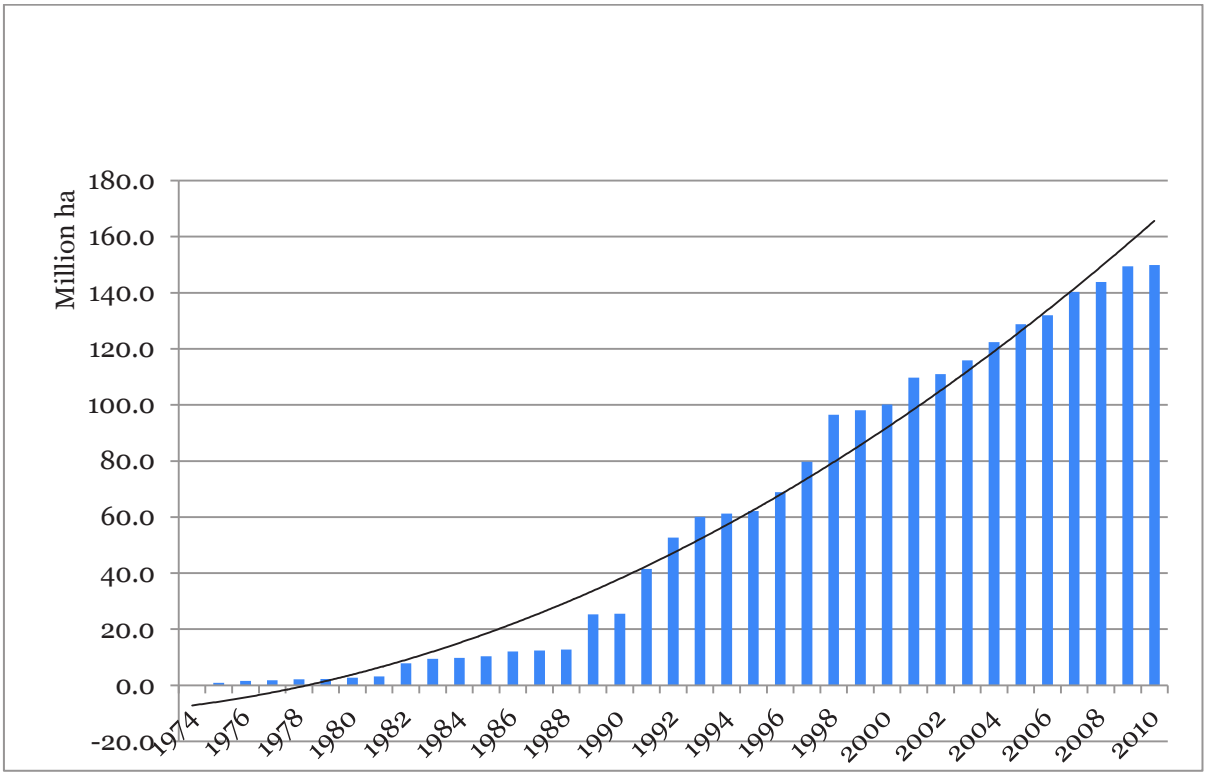


Figure 9. Growth of total area per year of Amazon ITs (2010)[81]

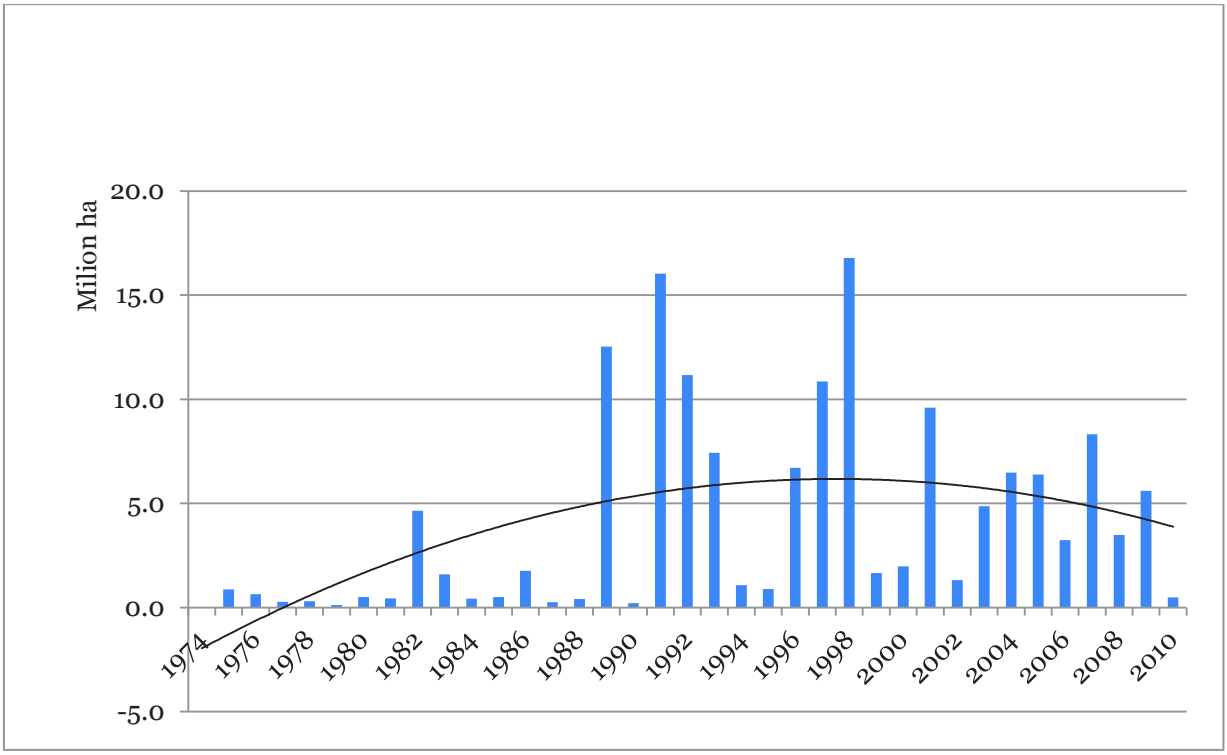


Table 5. Amazon ITs (and similar areas) – number, area and percentages (2010)[82]

	No. ITs		total area (ha)		average	% of each country's share of the Amazon	% of total Amazon
Bolivia[i]	393	12.9%	14,239,720	6.8%	36,233	32.1%	2.1%
Brazil	312	10.3%	100,889,351	48.5%	323,363	25.1%	15.1%
Colombia	185	6.1%	25,326,969	12.2%	136,903	51.9%	3.8%
Ecuador	357	11.7%	7,664,613	3.7%	21,470	63.9%	1.1%
Fr. Guiana	22	0.7%	715,105	0.3%	32,505	8.8%	0.1%
Guyana	116	3.8%	3,167,084	1.5%	27,302	15.0%	0.5%
Peru	1,581	52.0%	20,622,634	9.9%	13,044	26.2%	3.1%
Suriname[ii]	23	0.8%	4,918,469	2.4%	213,846	34.8%	0.7%
Venezuela	54	1.8%	30,380,355	14.6%	562,599	77.2%	4.5%
total	3,043	100.0%	207,924,300	100.0%	68,329	31.1%	31.1%

ITs are areas traditionally occupied for millennia by large and ethnically diverse groups of indigenous peoples in the Amazon. Generally well-preserved, these areas provide compelling examples of human populations living in harmony with the environment. The importance of Amazon natural ecosystems for IPs and other local communities goes without saying, as their livelihoods depend on using their entire territories for food (rotational multi-produce fields, hunting and fishing), health (natural medicines) and culture (cosmovision, spirituality, social relationships).

The relations between PAs, indigenous peoples and local communities have not always been easy. In contrast to the intrinsic 'bottom-up' traditional utilisation of land by indigenous people, the PAs paradigm based on the extrinsic 'top-down' national parks model, has been the dominating one for decades. As a consequence of colonisation and the continued desire to delineate and affirm borders, there has been a strong national (security) component to the origin and creation of PAs. This approach in the Amazonian countries has not always favoured indigenous peoples and the recognition of their rights and, in some cases has prioritised the interests of nature or biodiversity preservation. As a result, some PAs in the Amazon were created overlapping with indigenous or community lands, which in the absence of free, prior and informed consent , led to social conflicts on use and tenure. PAs have therefore not always been coherent with local interests, particularly those of IPs. The prevailing "parkist" mentality – where success is measured in "number of conserved hectares" - remains at the forefront of policy in some countries.

The issue continues to be debated and remains divisive among social groups, where positions range from rejecting nature PAs; to mutual recognition (of the protected area and the rights of indigenous peoples to their territories) and co-management; to proposing the indigenous territory or other CCA[iii] be recognised also as a nature protected area, under indigenous governance and management. [iv,83,84,85]

Recognising that most indigenous groups manage their lands and nature in an integrated way with their cultural, social and economic activities, several countries (particularly Brazil, Colombia and Bolivia) have successfully supported the legalisation of ITs in the context of ecosystem conservation, combining land tenure issues and governance with nature management.

[i] The database used for this report include 196 recognised ITs in Bolivia (with some 9.2 million ha) and 197 proposed ITs (with some 5.1 million ha). Nevertheless, sources from the country (Reyes J.F., Herbas M. La Amazonia Boliviana y los Objetivos de Desarollo del Milenio, ARA – Herencia, 2012; Cobija, Bolivia.) informs us that to date there are only 29 ITs in the Bolivian Amazon. This source states that indigenous peoples have requested recognition of about 13 million ha, of which approximately 8.5 million ha (63%) have been titled (although in many the process has not yet been concluded).

[ii] Suriname is one of the countries with no recognised indigenous territories – none of the 23 listed areas in the database used for this report (covering some 4,9 million hectares).

[iii] Community Conserved Areas (CCAs) can be defined as "natural and modified ecosystems, including significant biodiversity, ecological services and cultural values, voluntarily conserved by indigenous peoples and local and mobile communities through customary laws or other effective means". These areas are spaces *de facto* governed by indigenous peoples or local communities that have demonstrably positive outcomes for the conservation of biological and cultural diversity.

[iv] The recognition of ITs as a protected area category was proposed at the II Latin American Congress on National Parks and Other Protected Areas, Bariloche 2007. After technical discussions involving both representatives of indigenous peoples and protected areas experts, the conclusion was that ITs should be recognized as an appropriate governance model of protected areas. A proposal along these lines was presented and approved at the 4th World Conservation Congress, Barcelona 2008.

Textbox 8. Linking Indigenous Areas to the National Protected Area System – the Kanashen of Guyana

Charles Hutchinson, WWF Guianas

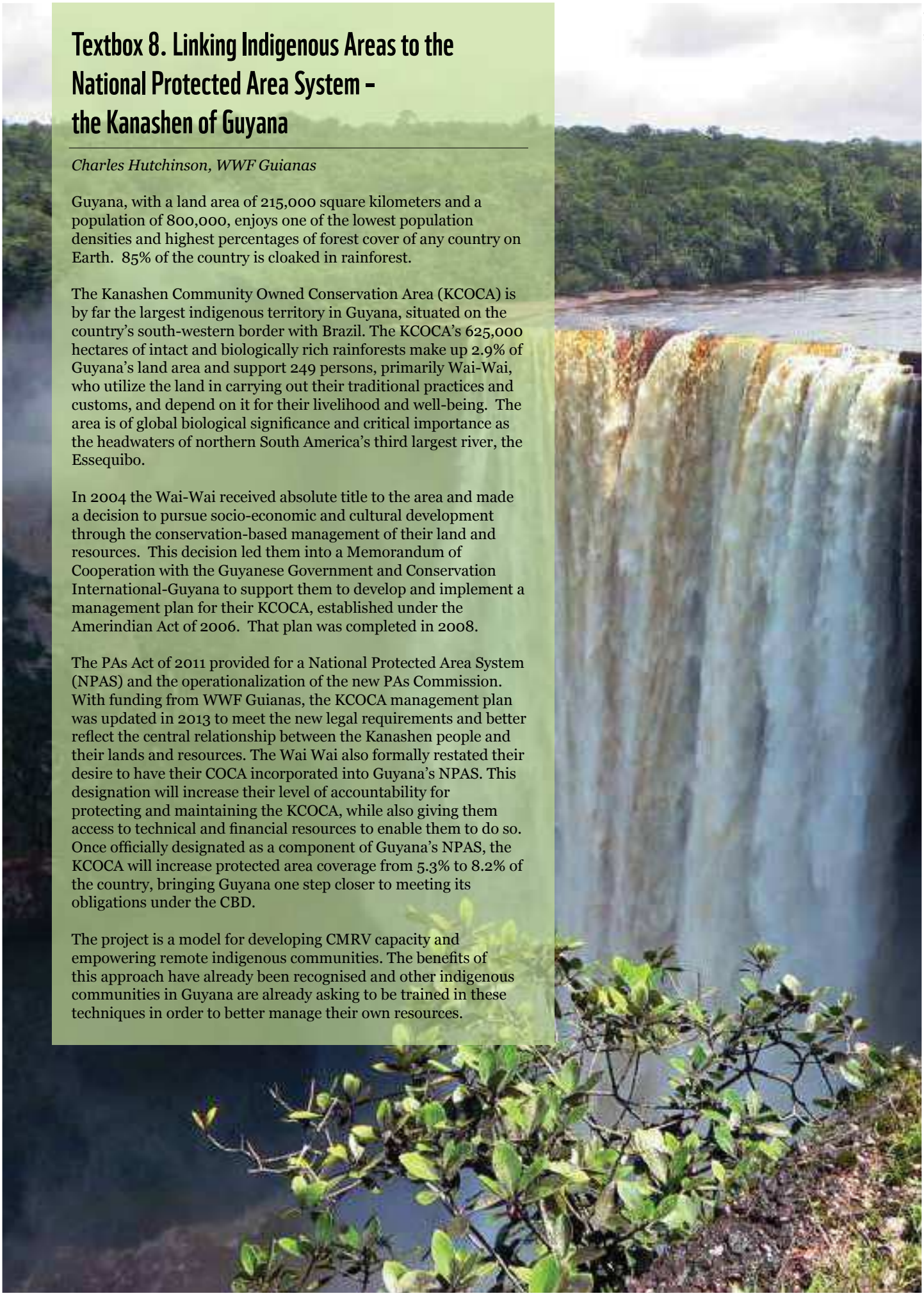
Guyana, with a land area of 215,000 square kilometers and a population of 800,000, enjoys one of the lowest population densities and highest percentages of forest cover of any country on Earth. 85% of the country is cloaked in rainforest.

The Kanashen Community Owned Conservation Area (KCOCA) is by far the largest indigenous territory in Guyana, situated on the country's south-western border with Brazil. The KCOCA's 625,000 hectares of intact and biologically rich rainforests make up 2.9% of Guyana's land area and support 249 persons, primarily Wai-Wai, who utilize the land in carrying out their traditional practices and customs, and depend on it for their livelihood and well-being. The area is of global biological significance and critical importance as the headwaters of northern South America's third largest river, the Essequibo.

In 2004 the Wai-Wai received absolute title to the area and made a decision to pursue socio-economic and cultural development through the conservation-based management of their land and resources. This decision led them into a Memorandum of Cooperation with the Guyanese Government and Conservation International-Guyana to support them to develop and implement a management plan for their KCOCA, established under the Amerindian Act of 2006. That plan was completed in 2008.

The PAs Act of 2011 provided for a National Protected Area System (NPAS) and the operationalization of the new PAs Commission. With funding from WWF Guianas, the KCOCA management plan was updated in 2013 to meet the new legal requirements and better reflect the central relationship between the Kanashen people and their lands and resources. The Wai Wai also formally restated their desire to have their COCA incorporated into Guyana's NPAS. This designation will increase their level of accountability for protecting and maintaining the KCOCA, while also giving them access to technical and financial resources to enable them to do so. Once officially designated as a component of Guyana's NPAS, the KCOCA will increase protected area coverage from 5.3% to 8.2% of the country, bringing Guyana one step closer to meeting its obligations under the CBD.

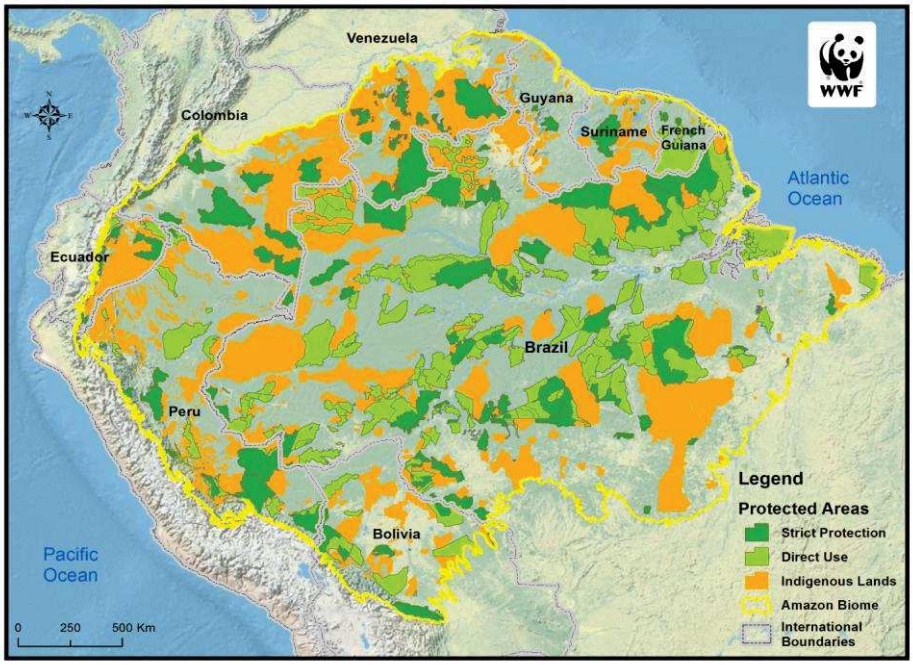
The project is a model for developing CMRV capacity and empowering remote indigenous communities. The benefits of this approach have already been recognised and other indigenous communities in Guyana are already asking to be trained in these techniques in order to better manage their own resources.



At Kaieteur Falls the Potaro River drops 225 meters from the Pakaraima Mountains in central Guyana

Rafael Garrido Sampaio from Romão community making a dug-out canoe, Amazonas state, Brazil

Figure 10. PAs and ITs in the Amazon biome (2010/2013)[86]



According to some indigenous peoples that WWF works with, ITs are not established for nature conservation purposes *per se*. ITs are set up primarily to recognise the rights of indigenous people to land and natural resources for social, cultural and equity reasons, and are managed and utilised through a combination of traditional and new sustainable practices. However, they can also contribute significantly to the conservation of nature, as exemplified by the integration of the Kanashen Community Owned Conservation Area (KCOCA) within Guyana's National Protected Area System **(Textbox 8)**.

Many ITs have acted as effective barriers against the expansion of forest conversion[87,88], but not all have had the same level of success. Several factors influence the success of these groups in effectively preserving their territories, including the presence of high value resources (oil, minerals, timber) (and therefore vested interests of government and private sector), land tenure situation, size, accessibility, governance and cultural characteristics.[89,90]

Amazon countries have different legal frameworks and policies regulating the management of indigenous peoples' territories.[91,92] In many cases IPs are managing the areas that they still hold often with significant conservation results, either managing them based on a holistic approach for their integration with nature **(Textbox 9)**, or through protecting specific parts of their lands.

ITs therefore act in a complementary way to PAs in the achievement of nature conservation objectives – not to replace the main, core role of PAs and not to distort the main social and cultural objectives of ITs.

In some sites in the Amazon there has been a close collaboration between PAs and ITs. Several examples in Ecuador (Cofan/Bermejo) and Peru (Alto Purus) show that PAs have been allies in the struggle of indigenous peoples to ascertain their rights and recognition.

Nevertheless, the designation of IPs territories is not yet considered as a nature conservation mechanism. In several cases other local communities – including communities of descendants of former African slaves, extractive communities, fishermen, small farmers, forest dwellers and other communities– also manage the areas they hold sustainably. A particular case are the 'extractive reserves' in Brazil, a PA category that was created to respond to the needs of local forest-dwelling communities, and that has influenced the definition of an international category of PAs management (Category VI). **(Textbox 10)**

Still, there is now an emerging social vision of nature conservation with the increased recognition of the role of ITs in biodiversity conservation and protection of critical spaces for ecological processes and maintenance of ecosystem services. An analysis of the state of PAs in the Amazon should therefore also include ITs to acknowledge the role they play in conserving the Amazon biome **(Figure 10)**.[93,94]

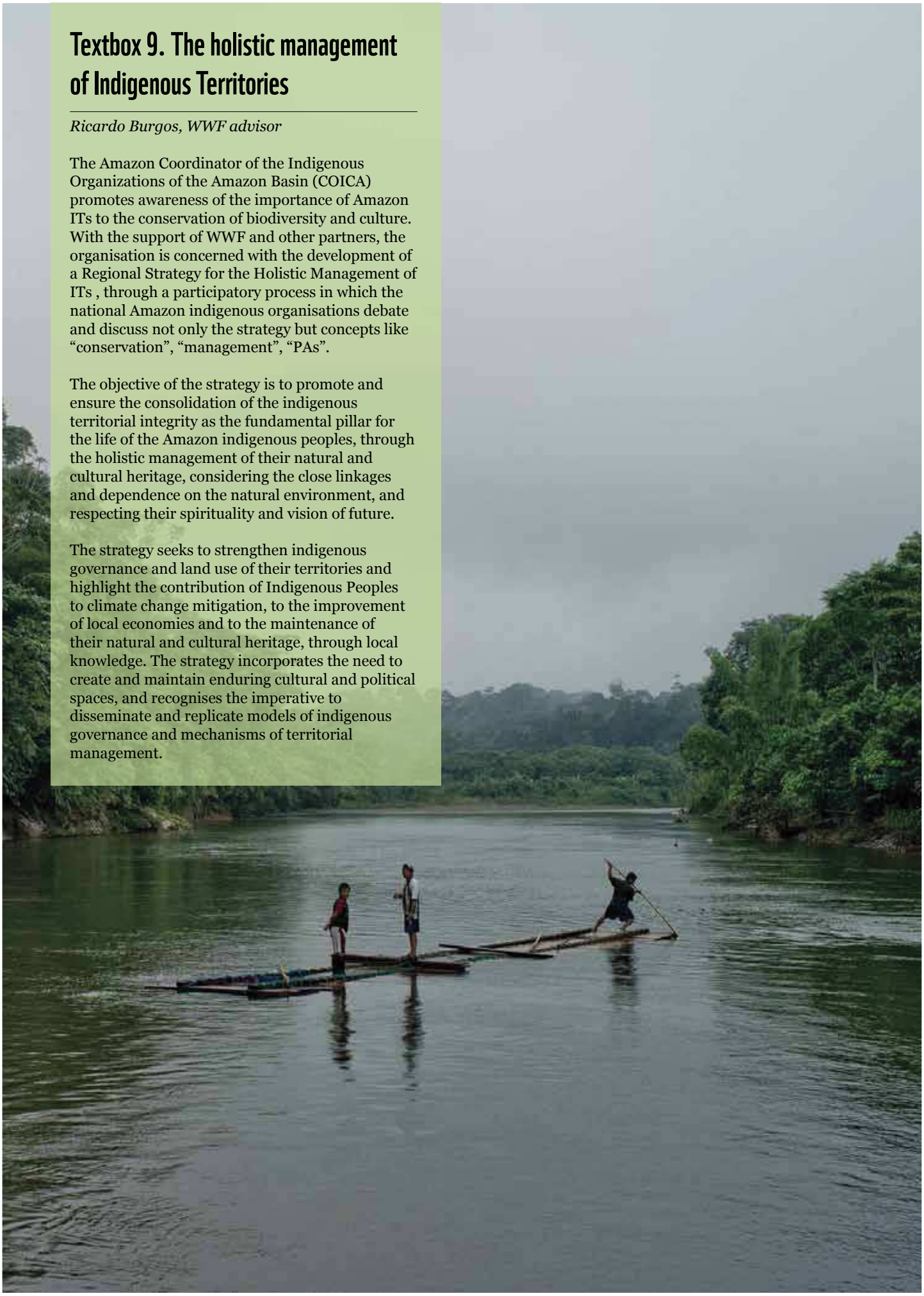
Textbox 9. The holistic management of Indigenous Territories

Ricardo Burgos, WWF advisor

The Amazon Coordinator of the Indigenous Organizations of the Amazon Basin (COICA) promotes awareness of the importance of Amazon ITs to the conservation of biodiversity and culture. With the support of WWF and other partners, the organisation is concerned with the development of a Regional Strategy for the Holistic Management of ITs , through a participatory process in which the national Amazon indigenous organisations debate and discuss not only the strategy but concepts like “conservation”, “management”, “PAs”.

The objective of the strategy is to promote and ensure the consolidation of the indigenous territorial integrity as the fundamental pillar for the life of the Amazon indigenous peoples, through the holistic management of their natural and cultural heritage, considering the close linkages and dependence on the natural environment, and respecting their spirituality and vision of future.

The strategy seeks to strengthen indigenous governance and land use of their territories and highlight the contribution of Indigenous Peoples to climate change mitigation, to the improvement of local economies and to the maintenance of their natural and cultural heritage, through local knowledge. The strategy incorporates the need to create and maintain enduring cultural and political spaces, and recognises the imperative to disseminate and replicate models of indigenous governance and mechanisms of territorial management.



Kichwa villagers, on a timber raft, transporting wood downstream on the Arajuno River, Ecuador

Textbox 10. The experience of Extractive Reserves in Brazil: Medio-Juruá

(Source: IBAMA, www.ibama.gov.br, 2011)

There are approximately 85 extractive reserves in the Brazilian Amazon, covering more than 14 million hectares of land under sustainable management. The Medio Juruá Extractive Reserve covers an area of 253,226.5 hectares and was created in March 1997. It is located on the Juruá River 1676.0km from the state capital (Manaus) by waterway in the municipality of Carauari, Amazonas, and is surrounded by other PAs like the Sustainable Development Reserve of Uácari, and the Indigenous Territory of River Biá areas.

The category of 'Extractive Reserve' is a class of areas used by traditional populations, whose subsistence is based on extraction, agriculture and small livestock. Ensuring the sustainable use of natural resources is central to the life and culture of these populations as a basic objective.

An Extractive Reserve is managed by a Deliberative Council, presided over by the body responsible for its administrative and constituted by representatives of public bodies, civil society organizations, and the traditional populations resident in the area.

The Extractive Reserve of Medio-Juruá emerged from the movement of the rubbers from Juruá, supported by the Catholic Church, the National Council of Rubber Tappers (CNS - now National Council of Extractive Populations) and the Movement Education Base (MEB) and with the Union of Rural Workers Carauari (STR) founded in 1991, the Association of Rural Producers Carauari (ASPROC). This association was established with the initial objective to organize and carry out the commerce of extractive production of its members.

Historically, in extractive reserves, communities and their organisations have a central management role. This role and the mobilisation and organisation of these social groups is a core element of the process of creating the area. Participation of reserve communities is integral to the creation of a management plan and such groups receive a real right-to-use as the main implementers and beneficiaries of all the programmes incorporated into the management plan.

The Rio Juruá, Brazil, as seen from the International Space Station (29 May 2007)

6.0 ECOLOGICAL REPRESENTATION OF AMAZON BIODIVERSITY

6.1 Methodology

In this analysis, a total of 390 national level nature PAs were identified in the Amazon Biome. As discussed, historically, protected area coverage was determined by more conventional objectives such as the protection of specific endemic and endangered species, landscape beauty and so on. Ecological representation (of biological diversity) is therefore a fairly modern concept emerging from the last 3 or 4 decades, and continues to grow in importance. A core principle in PA system design today is that the total system includes full representation of biodiversity (as far as possible, with the available scientific knowledge and data), ensuring that all known species, ecosystems, vegetation types and processes are duly included within the systems and network of PAs.[95,96]

Nevertheless, going beyond nature PAs, the CBD definition and the 2020 Aichi Biodiversity Targets do consider other forms of protection that can contribute to biological diversity conservation, its sustainable use and the fair sharing of benefits from it. In this sense, and in recognition of indigenous peoples' rights, this report also considers the possible complementary contribution for ecological representation from ITs and similar areas related to IPs. This report considers 3,043 ITs and similar areas (including recognised, proposed and not recognised areas)[i].

In the case of the Amazon, with its immense biological (including the species yet to be discovered by science), cultural and social importance, and the wealth of ecosystem services it provides (water supply, carbon stock, climate and rainfall stability, etc.), the proportion of protection required to achieve ecological representation needs to be well above the global average.

Generally, there is inadequate information available to determine the patterns and extent of regional biodiversity, for example the spatial distribution of all or most species and ecosystems in some level of detail for the whole biome. Therefore, in the absence of this information, a subset of representative biodiversity elements needs to be defined.

For the purpose of this analysis, two sets of spatial units were considered. First, for the terrestrial ecosystems, where it is easier to identify and assess the threats (mostly deforestation – see chapter 7), this report breaks the biome down into terrestrial ecoregions.[97] Thirty six ecoregions provide a basic layer of ecosystem representation for the final analysis. However, in order to provide a more comprehensive assessment of ecological representation, it is not sufficient to consider only the ecoregions. The constituent and diverse elements within them, including vegetation types, soils, geomorphological[ii] types and altitudes, should also be considered. Although terrestrial ecoregions can provide a good first picture of ecosystem representation, freshwater heterogeneous units within terrestrial ecoregions need to be defined, so that they may provide a sufficiently detailed analysis to inform national and regional policy decisions and their implementation, such as identifying priority areas for conservation, and decisions on the creation of new PAs. These freshwater heterogeneous units (or 'aquascapes') represent the second type of spatial unit considered in this report.

The analysis for assessing the degree of ecological representation of freshwater habitats in PAs and ITs here goes deeper than the terrestrial approach for a number of reasons. Aquatic ecosystems are not often considered in ecological representation studies, and as a result, they are less well protected than terrestrial ecosystems, even though they are increasingly under threat from damming, river bed excavation pollution and deforestation of terrestrial riparian vegetation, among others.[iii] It is even more difficult to identify information on the spatial distribution of aquatic biodiversity than on

[i] As discussed in chapter 5, and based on the best possible interpretation of the available data (RAISG, 2010), 74% of listed ITs were recognised, between 5% (in area) and 8% (in number) were proposed, and between 19% (in number) and 21% (in area) were not recognised. Other types of community conserved areas should also be considered here, even when not recognised by national systems, for the same reasons, but there is no database available yet.

[ii] Geomorphology is the scientific study of landforms and the processes that shape them.

[iii] Considering the lower ecological representation level, the important threat level and the difficulty in applying terrestrially terrestrially born concepts to protect freshwater ecosystems, it would be advisable to consider specific aquatic protection

terrestrial biodiversity (from conceptual difficulties to problems related to mobility, as well as a smaller body of research) and therefore it is necessary to use proxies to identify and define freshwater ecosystem spaces.

Once defined, the terrestrial and freshwater spatial units formed the basis for the representation analysis to determine (through the surrogates of ecoregions and heterogeneous units as discussed above) the extent to which biodiversity was represented by areas managed for conservation. Firstly, a conservative analysis was carried out focusing only on the coverage of nature PAs, in the sense that they are created and managed exclusively for nature conservation purposes and are sanctioned by governmental decisions and actions. A more inclusive analysis was then applied that considers ecological representation by PAs and the ITs together, based on the assumption that ITs can significantly contribute to the conservation of ecological processes while at the same time placing greater value on ITs, which responds to the interests of the majority of IPs .

Aside from the methodology adopted to define the spatial units, it was also necessary to determine what constituted 'effective ecological representation'. There is an ongoing debate on the level of representation required to adequately guarantee the viability of all species and natural communities in a given area over the long term.[98,99] The 1992 World Congress on National Parks and Other PAs (Caracas) and the 2010 biodiversity conservation targets agreed in Caracas recommended a 10% protection target in each bio-geographic unit on Earth. Although seemingly ambitious a few decades ago, this target has often been considered simply as a politically "realistic" target.[100,101] More recent scientific recommendations have widely considered this target to be insufficient.[102,103]

Targets of 50% and higher have been suggested by scientific studies that have attempted to quantify adequate representation on the basis of ecological parameters such as ecological structure, diversity, and resilience or to represent and protect "most elements" of the biodiversity of an area.[104,105,106] These values are assumed to vary in response to various factors in a region or habitat type, including connectivity, natural disturbance, and human resource use.

The Amazon currently has 25% PAs coverage, even if with insufficient ecological representation, and most Amazon countries have more than 10% of their Amazon share protected (one country has more than 30%, four countries have between 30 and 20%, 3 between 20 and 10%, and one below 10%). Brazil defined a 10% target for most of its biogeographic domains (such as the Cerrado, Atlantic Forest and Pantanal, or the corresponding Brazilian shares of them. But for the Amazon, Brazil set a 30% target for 2010.[107] Based on a number of intensive modelling processes, WWF has also concluded that a 30% coverage by 2020 is necessary, including full ecological representation (that aims to protect close to 100% of biological diversity through ecologically representative samples).[108,109,110]

More recently, with an increased awareness of the importance of ecosystem services and the multiple roles of PAs, global scientific opinion has evolved to consider a minimum protected surface area of 17% of terrestrial and inland water areas, especially areas of importance for biodiversity (species, ecosystems and genetic diversity) and ecosystem services, 'through effectively and equitably managed, ecologically representative and well connected systems of protected areas … that are integrated into wider landscapes and seascapes' (Aichi Target 11[i]).

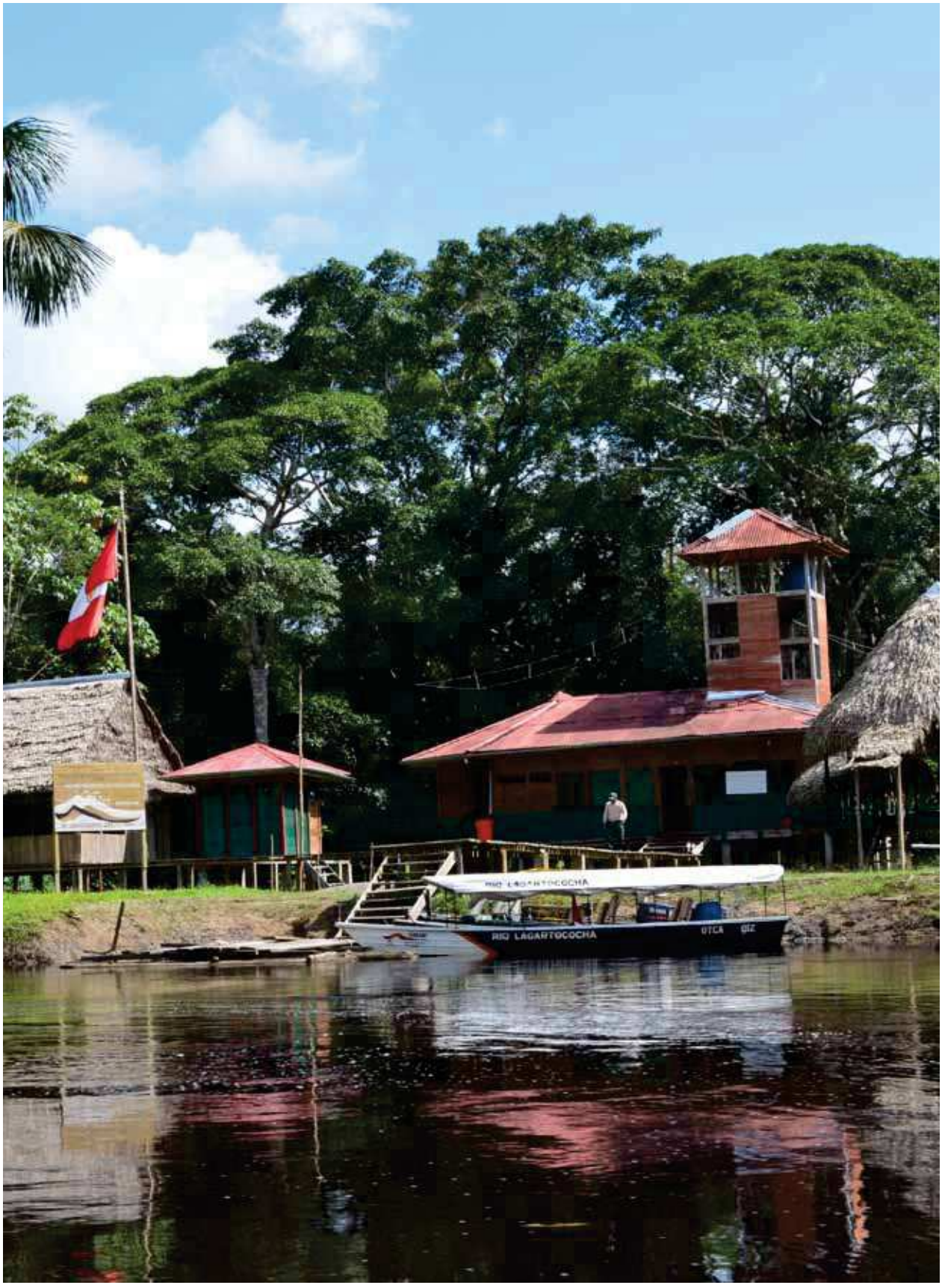
However, considering the importance of the Amazon region to the world and the level of protection still possible, Brazil has maintained the 30% protection target by 2020 for the Amazon.[111] WWF is also recommending a 30% target for the Amazon (therefore almost doubling the 17% Aichi target for this unique region), while at the same time strongly promoting the full implementation of all other constituent elements of Aichi Target 11 (effective and equitable management, ecological representation, well connected PA systems, integrated into wider landscapes). WWF is also recommending that wherever possible, countries consider nature PAs only, both individually (per country) and integrated as part of a Pan-Amazon regional approach.

Therefore, for this analysis, three representation levels are analysed. These are a) the "classic '10%'" target that used to be the *minimum minimorum* level to be considered, now surpassed; b) the current Aichi biodiversity 17% target agreed by governments at global level in 2010; c) WWF's 30% target, with good ecological representation as the minimum required to maintain the biological core of one of the most important natural and biodiversity-rich regions on Earth.[ii] The Brazilian

guidelines – for instance, consider the inclusion of the 'protected rivers' concept within protected areas systems (not as a new category, but as a more effective approach to conserving freshwater attributes).

[i] **Aichi Target 11:** "By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes."

[ii] The stark reality is that in order to maintain the ecosystem services that the Amazon provides, particularly climate stability, a minimum of some 60-70% of the region needs to be maintained in good shape for ecological reasons, keeping vegetation structures and main ecological processes functioning. This target is important as it would help achieve a strong reduction in greenhouse gas emissions. WWF's target for emissions reductions from land use is zero net deforestation by 2020 – in the case of the Amazon, we should keep the ecological conversion to a maximum of 20% for climate reasons.



Ministry of Environment (Peru) station, Gueppi National Park, Lagartococha river, border with Ecuador

2010 target has been set at 30% of the Brazilian Amazon biome under nature PAs – however, it does not include ITs and does not consider internal heterogeneity and its specific ecological representation.

As said above, the analysis in this report firstly reviewed representation secured by PAs only and then secondly by adding in ITs. This approach was necessary because the PAs are officially defined and managed for nature conservation. By definition, these areas are created and managed for nature (or biodiversity) protection. This includes safeguarding the important social and economic ecosystem services biodiversity provides. ITs (and other community conserved areas that might be considered), are created and managed mostly for social and cultural purposes. In a more inclusive approach, these areas are more or less acknowledged to contribute to ecological conservation. Therefore, it can be asserted that PAs are a fundamental element of ecological representation and that ITs also contribute immensely to biodiversity protection. The role of the latter should be considered complementary to PAs.

6.2 Results

6.2.1 Ecological representation of Amazon terrestrial ecoregions

When applying the classic and outdated 10% target and considering only PAs for nature conservation, 31 out of 36 terrestrial ecoregions are sufficiently represented in the ecological representation assessment. When considering the global average 17% target (Aichi Target 11), the number of ecoregions satisfactorily represented dropped to 23. If using WWF's recommended 30% target, only 11 ecoregions are sufficiently well protected.

When the ITs and similar areas are included in the analysis, as expected, the ecological representation is increased. The 10% target is achieved for all ecoregions; the 17% target is achieved for 34 out of 36 ecoregions; and for the 30% target, there is a conservation gap in 5 ecoregions **(Table 6; Figure 11 and 12)**.

Although the total area under protection has been increasing, the challenge ahead is directing the creation of new areas to include specifically under-represented ecoregions. There are concentrations of less protected ecoregions in the south-eastern front of the Amazon, in Brazil, including the extreme east, and extensive low lands in central Bolivia, followed by large areas in central Amazon (Brazil), central north (Brazil, Venezuela, Colombia and Guyana) and central western (Peru, Ecuador and Colombia). (See classes of below 10% and below 17% in **Figures 11 and 12.**) Some ecoregions are better conserved than others. Pantepui, Marajó várzea, Bolivian montane dry forests, Purus-Madeira, and Tapajós-Xingu moist forests, Gurupa várzea and Bolivian Yungas, are examples of areas that enjoy a high level of conservation. At the other extreme, exposed to a much lower conservation level are the Mato Grosso seasonal forests, Beni and Guianan savannahs, Guianan freshwater swamp forests, Xingu-Tocantins-Araguaia, Tocantins/Pindare, Napo and Solimões-Japurá moist forests, and Marañón and Apure-Villavicencio dry forests. **(See Figures 11 and 12 and Table 6.)**

Table 6. Ecological representation: level of protection and coverage of Amazon terrestrial ecoregions[112]

Ecoregion	**% PA** (protected by PA)[i]	**% IT** (covered by IT)	**% IT+PA**
Mato Grosso seasonal forests	5	22	27
Beni savanna	8	18	26
Xingu-Tocantins-Araguaia moist forests	6	27	33
Guianan freshwater swamp forests	6	31	37
Marañón dry forests	10	18	28
Tocantins/Pindaré moist forests	11	6	17
Napo moist forests	13	34	47
Solimões-Japurá moist forests	14	40	54
Apure-Villavicencio dry forests	15	0	15
Guianan savanna	14	42	56
Monte Alegre várzea	16	5	21
Negro-Branco moist forests	16	43	59
Juruá-Purus moist forests	17	19	36
Iquitos várzea	19	14	33
Southwest Amazon moist forests	19	32	51
Ucayali moist forests	20	23	43
Peruvian Yungas	22	10	32
Guianan moist forests	23	18	41
Eastern Cordillera real montane forests	22	38	60
Madeira-Tapajós moist forests	25	18	43
Rio Negro campinarana	27	25	52
Guianan piedmont and lowland moist forests	26	47	73
Cordillera Oriental montane forests	28	0	28
Purus várzea	28	22	50
Caquetá moist forests	29	33	62
Guianan Highlands moist forests	34	45	79
Japurá-Solimoes-Negro moist forests	36	27	63
Cordillera Central páramo	37	0	37
Uatumã-Trombetas moist forests	43	24	67
Bolivian Yungas	45	10	55
Gurupá várzea	46	0	46
Tapajós-Xingu moist forests	47	25	72
Purus-Madeira moist forests	50	9	59
Bolivian montane dry forests	57	0	57
Marajó várzea	63	2	65
Pantepui	65	27	92

[i] Key for % protected by PA: 0-10%, 11-17%, 18-30%, 30>%

Figure 11. Ecological representation: level of protection of Amazon terrestrial ecoregions – by PAs (2013)[113]

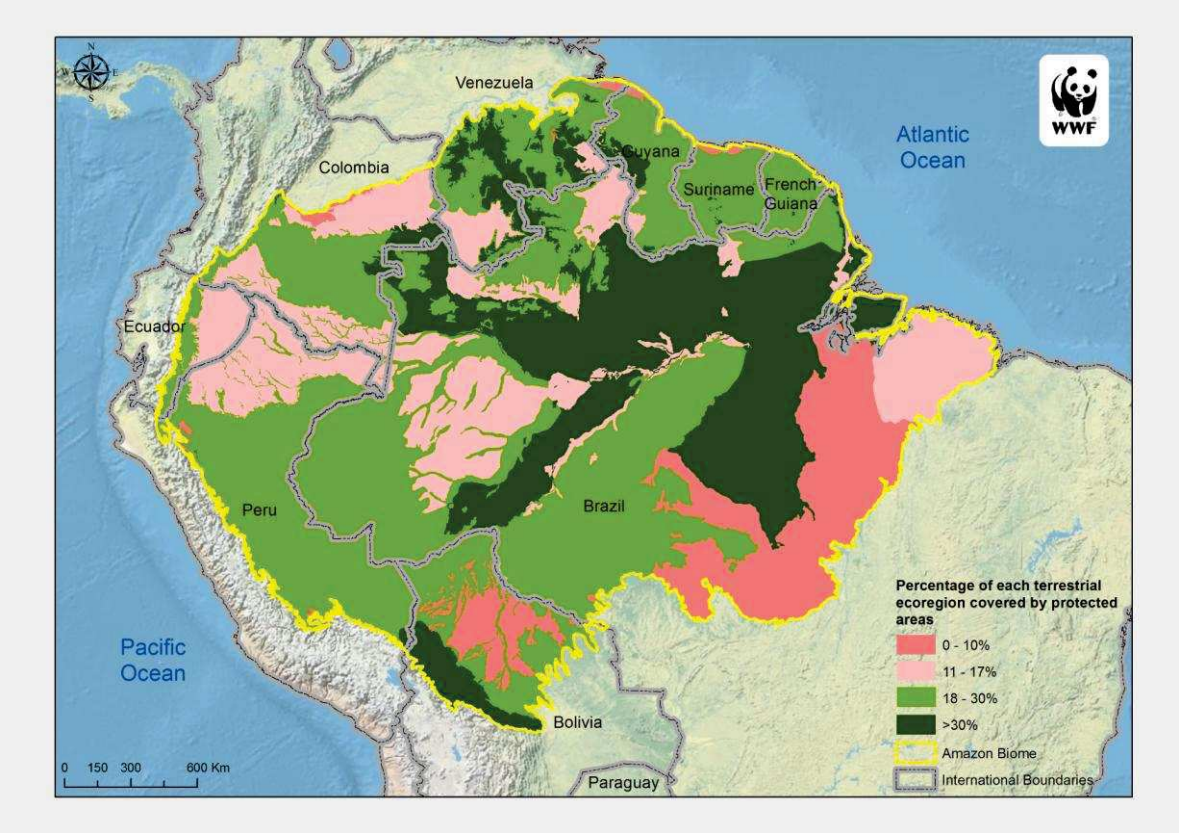
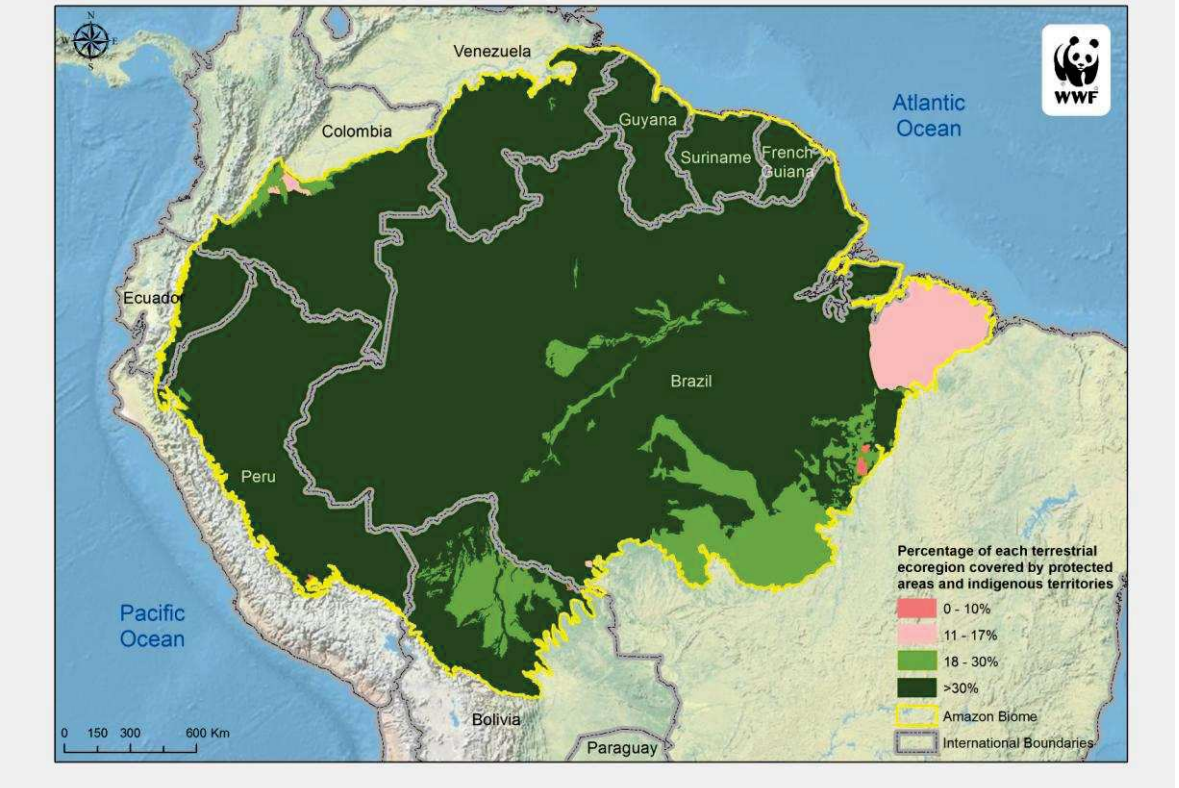


Figure 12. Ecological representation: level of protection and coverage of Amazon terrestrial ecoregions – by PAs and ITs (2010/2013)[114]



6.2.2 Ecological representation of freshwater heterogeneity units

39 percent of the 312 freshwater areas (heterogeneity units or "aquascapes") are not represented in PAs whereas 22% are not represented in either PAs or ITs **(Figure 13 and 14)**. Only 65 freshwater systems (21%) have more than 30% of their areas within PAs. However, if we consider PAs and ITs combined, almost half of them have more than 30% of their range protected. The least protected aquatic systems are located in the peripheral areas of the Amazon, in the Brazilian states of Pará and Mato Grosso, and parts of the Andean-Amazon higher slope, along most of the rivers, particularly the main rivers and mainly the Amazon, Negro and others, areas in Guyana and in Venezuela (see areas below 10 and below 17% in **Figure 14**) followed by larger areas in the same south-eastern Brazilian Amazon, large parts of Bolivia and Guyana, as well as some smaller but yet very significant areas in Peru, Colombia and Ecuador (see areas below 10 and below 17% in **Figure 13 and 14**) .

This analysis has focused on different environments (terrestrial and aquatic) and has used different methodologies for the 'aquascape units' and the terrestrial ecoregions. Furthermore, the 'aquascape units' are heterogeneous amongst themselves within single ecoregions. However, despite these variations, some correlations still seem possible. At the best protected end of the spectrum (above 30% protection, considering nature PAs only), there seems to be a good correlation between **Figures 11 and 13**, although generally there is less protection of the 'aquascape units' occurring along rivers.[i] At the other end of the spectrum are the least well protected ecoregions and 'aquascape units' which have less than 10% on the maps that consider PA and IT **(Figures 12 and 14)**. Comparing these two maps, the importance of going beyond ecoregions becomes is clear. It is no surprise that the 'aquascape units' are less well protected in the 'arc of deforestation' (some of which unfortunately may already be lost) and along the lower-middle Amazon, as well as some stretches and some 'aquascape units' (not yet well identified) on the Andean-Amazon slopes.[ii]

Those ecoregions and aquascapes with less than 30% representation need to be targeted for further protection work by governments and other social actors interested in biodiversity conservation. Within these areas, all efforts should be made to select well-chosen priority areas for expanded protection (or for creation of new nature PAs) in order to achieve sufficient protection within them. Also, in order to achieve global biodiversity targets, the other conditional elements (management effectiveness, equity, connectivity, integration in the landscapes/aquascapes…) need to be considered as well, in addition to surface area coverage with ecological representation.

Creating new PAs might be feasible for certain ecoregions and aquascapes but more difficult for others, such as those that are located in countries where expanding the existing PA system is difficult given limited availability of well conserved natural ecosystems. When ITs are included, it becomes easier to raise ambition levels of protection targets. This provides a compelling argument to focus on both PAs and ITs for achieving biodiversity conservation, while at the same time recognising their different purposes, roles and functioning rules.

In further assessments, more attention should be given to include nature PAs at the subnational level (including local level) and private lands with voluntary engagement.

It should be acknowledged that this analysis only considers ecoregional representation in the terrestrial environment and the constituent heterogeneity units ("aquascapes") in the aquatic environment, and does not consider the representation of all elements of biodiversity (ecosystems, species, genetic diversity, etc.). The selected elements for analysis are designed to act as proxies of wider biodiversity which hopefully will contribute to increasingly accurate biodiversity assessments in future.

[i] Curiously, some stretches like the 'aquascape units' of the Andean-Amazon slopes (not yet well identified) seem to be more protected inside the 'badly protected' ecoregions (at the 30% level, with only PA).

[ii] It is a surprise to find the low protection status of the Guianas Shield (between Guyanas and Venezuela), including the 'Tepuis', the stretch in the Northern part of the Colombian Amazon and the central portion of Bolivia (possibly the Beni plains/lowland forests).

Figure 13. Ecological representation: level of protection of Amazon heterogeneity units with aquatic interest – by PAs (2013)[115]

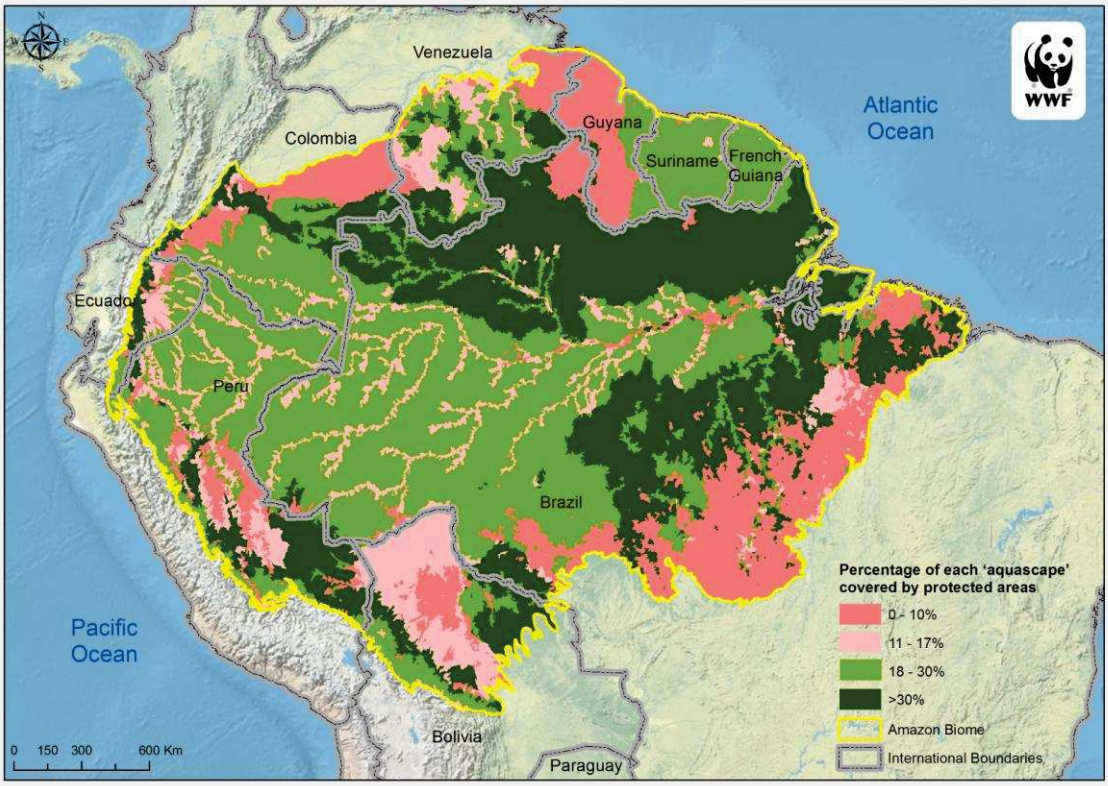
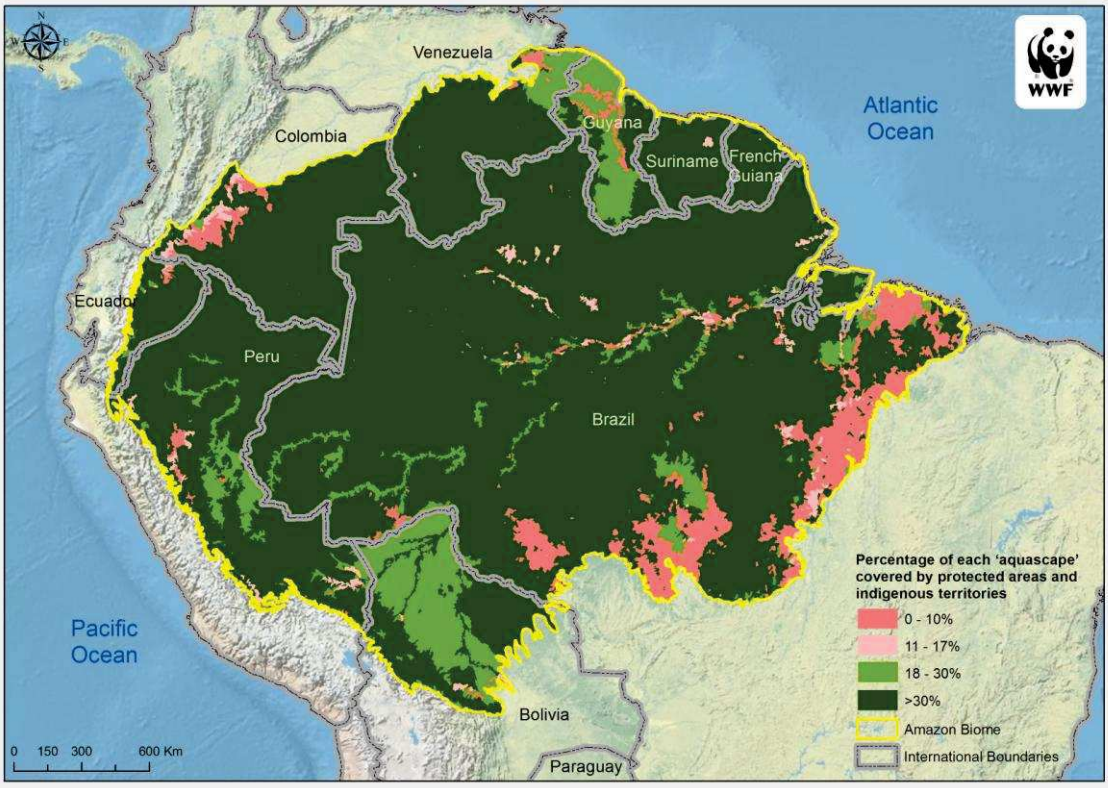


Figure 14. Ecological representation: level of protection of Amazon heterogeneity units with aquatic interest – by PAs and ITs (2010/2013)[116]



7.0 THREATS

Nature PAs were originally established in the Amazon region during a time when physical, geographical and political space was provided for their creation. Several large PAs offered the region a model of sustainable development, where a strong preventative approach to nature conservation was promoted in one of the most important regions on Earth. In many parts of the Amazon, these areas were established in sites with marginal opportunity costs and relatively removed from the main commodities markets. With increased accessibility driven by colonisation and infrastructure projects, a series of threats began to emerge due to the absence of a coherent integrated sustainable development vision for the region and the poorly planned or regulated expansion of activities related to the economic development or (geo)-political interests.[117,118,119] The traditional protection provided by the isolation of vast portions of the Amazon ended.[120,121,122,123]

Small scale deforestation driven mostly by the local slash and burn agriculture and the occupation alongside the rivers has always been present. Large scale deforestation however grew in the middle of the 20th Century, increasing through the 1970s and 1980s.[124] This destruction was the result largely of land conversion driven by a complex range of factors, including land speculation, land grabbing associated to the price of the land, new road routes and access into the rainforest, large scale agriculture and cattle ranching, and interest in exploiting natural resources (timber, minerals, oil and gas, and hydropower).[125] Today, these threats persist.[126] The prevalence of agribusiness including cattle, soy, palm oil, sugarcane, along with the continuation yet of land speculation[127,128,129], has drastically accelerated deforestation.[130,131,132]

To date, the Amazon has lost almost one-fifth (17%) of its original natural vegetation[133]. If current deforestation rates of 2 million hectares per year continue, 25% could be lost by 2020.[134,135] Some ecoregions have suffered more extensively from deforestation than others. Some one million hectares was destroyed just in the period 2004-12 in the Madeira-Tapajós moist forests, Mato Grosso seasonal forests, Xingu-Tocantins-Araguaia moist forests, Southwest Amazon moist forests and Tapajós-Xingu moist forests[136] **(Table 7)**.[i] Statistics from the Brazilian government in 2013 show deforestation was up by 29% from the year before. Satellite data showed that almost 600,000 hectares (2,315 sq miles) of forest were cleared during that period, predominately in the states of Para and Mato Grosso, where most of Brazil's agricultural expansion is occurring.

Future deforestation projections range in severity; depending on the progress of control policies and voluntary market standards, deforestation levels could range between 25 to 50% (that's up to half the size of Europe) between 2030 and 2050.[137,138] Freshwater ecosystems are also under threat, both from direct intervention (such as damming) and the deforestation of riparian vegetation (which strongly affects them).[139] As demonstrated, their conservation and ecological representation is not yet complete and they are increasingly under pressure due to deforestation (particularly those ecosystems close to water bodies), infrastructure for energy, transportation and others.

The battle for the sustainable development of the Amazon continues.[140] The effectiveness of PAs continues to attract criticism, but it is clear that the ecological and social-economic benefits of these sanctuaries far exceed the costs of managing them. For example, studies have shown that deforestation is significantly lower inside PAs and ITs, than outside of them – roughly between 2 to 30 times less.[141]

As not all ecoregions are adequately represented by PA systems, particular attention should be given to those located in the classic Brazilian 'deforestation arc' in southern and eastern Amazon. In addition to these are those ecoregions situated alongside rivers (e.g. floodplains) and the Andean-Amazon transition zone, including the non-typically forested ecosystems such as savannahs, grasslands, and others.

[i] The Pan-Amazon deforestation assessment presented here is qualitative based on ecoregions. See more details in the 'Appendix 2. Technical Supplement', 'A2.4. Procedure of Deforestation Assessment'.

Deforestation in the National Forest of Bom Futuro, Rondônia, Brazil

Table 7. Amazon Terrestrial Ecoregions: Deforestation Threats[142]

Ecoregions	Deforestation 2004-12	
	Percentage	Gross (ha)
Apure-Villavicencio dry forests	9.13%	67,13
Xingu-Tocantins-Araguaia moist forests	6.91%	1,832,363
Mato Grosso seasonal forests	6.24%	2,224,030
Madeira-Tapajós moist forests	4.92%	3,525,750
Tocantins/Pindaré moist forests	3.78%	728,006
Tapajós-Xingu moist forests	3.12%	1,045,456
Purus-Madeira moist forests	2.65%	459,581
Ucayali moist forests	2.36%	269,538
Iquitos várzea	1.74%	199,056
Southwest Amazon moist forests	1.50%	1,116,700
Caquetá moist forests	1.12%	205,319
Beni savannas	0.84%	103,963
Monte Alegre várzea	0.84%	55,644
Purus várzea	0.63%	111,994
Uatuma-Trombetas moist forests	0.53%	247,031
Gurupa várzea	0.49%	4,888
Napo moist forests	0.46%	114,45
Marañón dry forests	0.42%	1,487
Marajó várzea	0.42%	34,231
Bolivian Yungas	0.41%	36,981
Guianan moist forests	0.39%	187,075
Guianan piedmont and lowland moist forests	0.38%	88,025
Guianan savannah[i]	0.36%	37,656
Cordillera Oriental montane forests	0.36%	7,124
Negro-Branco moist forests	0.33%	66,031
Eastern Cordillera real montane forests	0.31%	21,219
Pantepui	0.31%	15,875
Guianan Highlands moist forests	0.30%	43,305
Solimões-Japurá moist forests	0.26%	44,169
Juruá-Purus moist forests	0.24%	58,719
Rio Negro campinarana	0.21%	19,763
Japurá-Solimões-Negro moist forests	0.21%	55,094
Peruvian Yungas	0.19%	18,906
Bolivian montane dry forests	0.11%	151

Today, for several reasons, including the interests of large expanding hydropower, mining and hydrocarbon operations[143], in many countries the creation of new protected or sustainably managed areas is being put on hold, while threats to existing ones critical for climate change adaptation continue to grow.[144,145] The situation is echoed for indigenous groups and their territories in the region.[146,147] The development of hydroenergy[148] and new road infrastructure projects[149,150] are affecting the physical and legal integrity of PAs.[151] The direct threats to the integrity of PAs and to the biodiversity and the wellbeing of the associated human population are deforestation and destruction of habitat by advancing agriculture and degradation through ill-planned species extraction by overfishing, logging and hunting, and pollution and habitat disturbance by urbanisation, extractive industries and hydropower.

But there are also the "threats from inside". PAs systems in South America, including the sub-systems and individual PAs in the Amazon, still need design and management improvements, as well as better integration with the (sustainable) development plans and programmes. Among the main difficulties of PAs, are the ones related to:

- Flawed design – definition of proposals and creation (declaration) of new PAs follow more other reasons, such as land tenure, opportunities, specific advocacy groups, than ecological representation and integrity;

[i] Some field related sources have provided information that this number is probably under considering the ecosystem conversion. This could be happening due to inaccuracy of analytical techniques that may not be adequately reflecting the real conversion of natural savannah into agriculture.

- Poor management – insufficient funding, staff, management programmes, and integration in the landscape and into development plans and programmes;
- Overlaps with indigenous peoples' and local communities' lands, without respecting their rights (including prior informed consent);
- Conflicts with IPs and local communities' needs, either because of the above indicated mismanagement, or due to poverty-impelled migration and unsustainable use of resources to satisfy immediate needs (it is possible that, in some cases, for some people, the PA could be a possibility of subsistence (usually due to the lack of capacity to overcome or even react to pressures from other, stronger economic agents, associated to the fact that the PAs still harbour resources); Illegal economic interests associated to illegal logging, overexploitation of renewable and non-renewable resources, traffic of species – several of them sometimes linked to drug-trafficking and other illegal activities;
- Infrastructure and resource exploitation pushed or accepted by governments without due-diligence, such as mining and oil activities, roads, etc.;
- Weak institutions, low budgets and lack of political power to protect biodiversity and use wisely the natural resources.

Indigenous Territories also suffer from similar problems, worsened by other elements, such as the lack of IT legal recognition by the State and the lack of acknowledgement of their conservation roles by several sectors.

A complex set of drivers lies behind these threats, many of them interrelated:

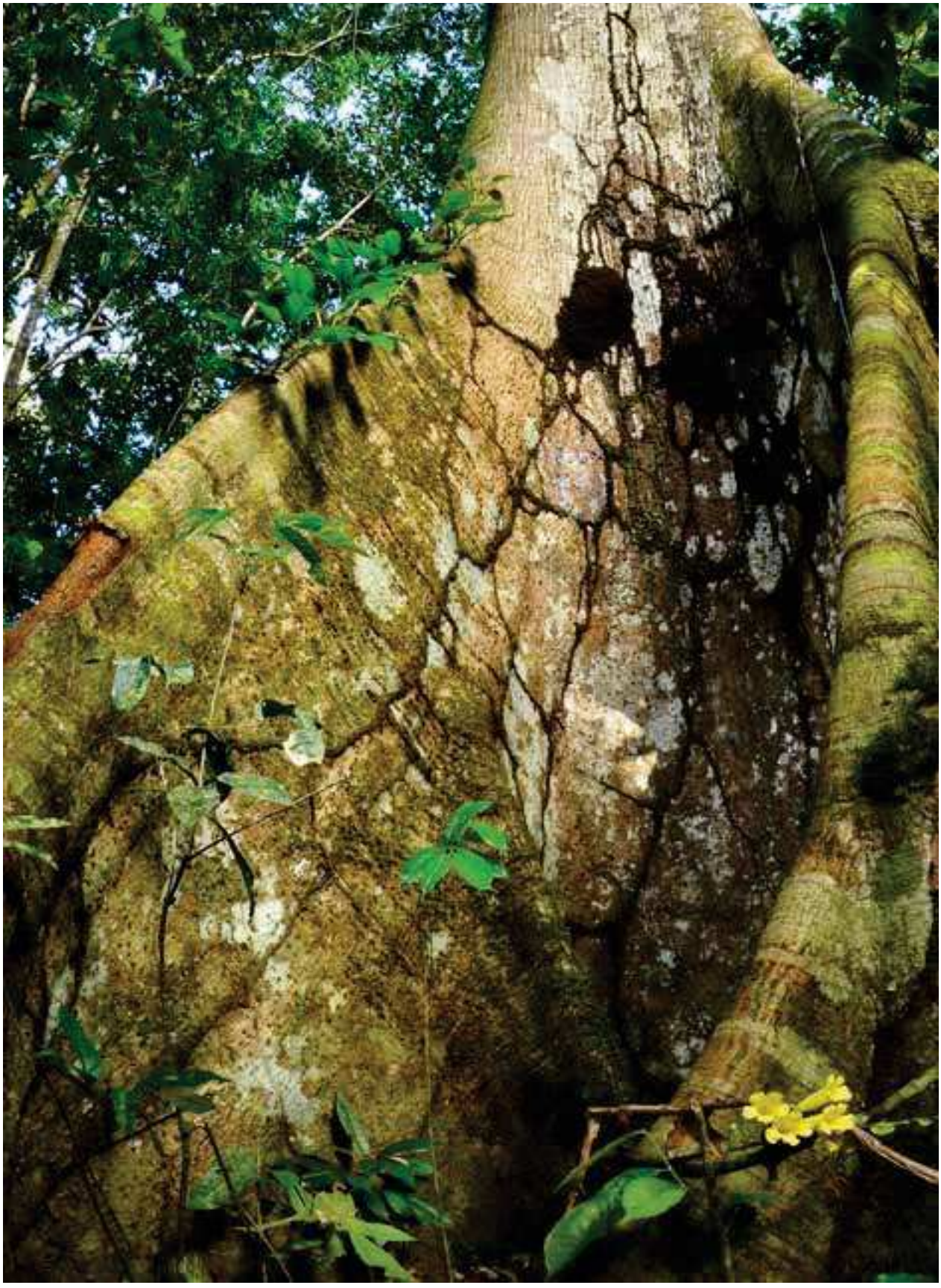
A. Policy and governance drivers
- Perverse policy incentives, embedded within a development paradigm that does not take the Biome's dynamics into consideration but is based on increasing GDP, exports and energy security;
- Weak governance and enforcement; in all countries Amazon PAs are highly understaffed to perform basic surveillance and control functions;
- Inadequate legal frameworks that do not regulate or enforce management standards;
- Unclear land tenure and zoning leading to opportunistic use of land and land grabbing.

B. Markets and private sector drivers
- Market demand, locally (timber and non-timber forest products, fish, transport, bushmeat), national (food, timber, energy) and internationally (commodities);
- The interests of powerful sectors promoting increase of agro-industry, extractive industries, energy projects;
- Access to land (including illegally or irregularly) – facilitated by road and river transport infrastructure.

C. Society drivers
- Inadequate knowledge about sustainable management practices;
- The perception that standing ecosystems have a lower economic value relative to alternative sustainable other uses;
- Lack of knowledge and valuation of Amazon ecosystem services.

Another threat to PAs and all the benefits they provide is impermanence. By definition PAs are established, declared or created to be permanent. If they are servicing the interests of local and indigenous communities and the economic development of regions and countries, then they are an integral part of sustainable development in the Amazon. Unfortunately this is not how PAs are always perceived. In the Amazon, against this wall of development threats, the existing protected area network is being slowly eroded under a debilitating process of downgrading, downsizing and degazettement (PADDD) **(Textbox 11)**.

The Amazon Biome is suffering from increasing pressure on several fronts, and PAs – which are among the most important defence mechanisms for biodiversity and ecosystem services – are themselves increasingly under threat from development projects, without any compensation efforts at all. Political and physical threats are also escalating against the ITs. Unfortunately, what we see now, is that the threats and undesired changes to PAs and ITs may be longstanding.



Mighty Amazon tree and buttress, Juruena, Brazil

Textbox 11. PADDD-PAs Downgrading, Downsizing and Degazettement

Sandra Charity, LAI Programme Development

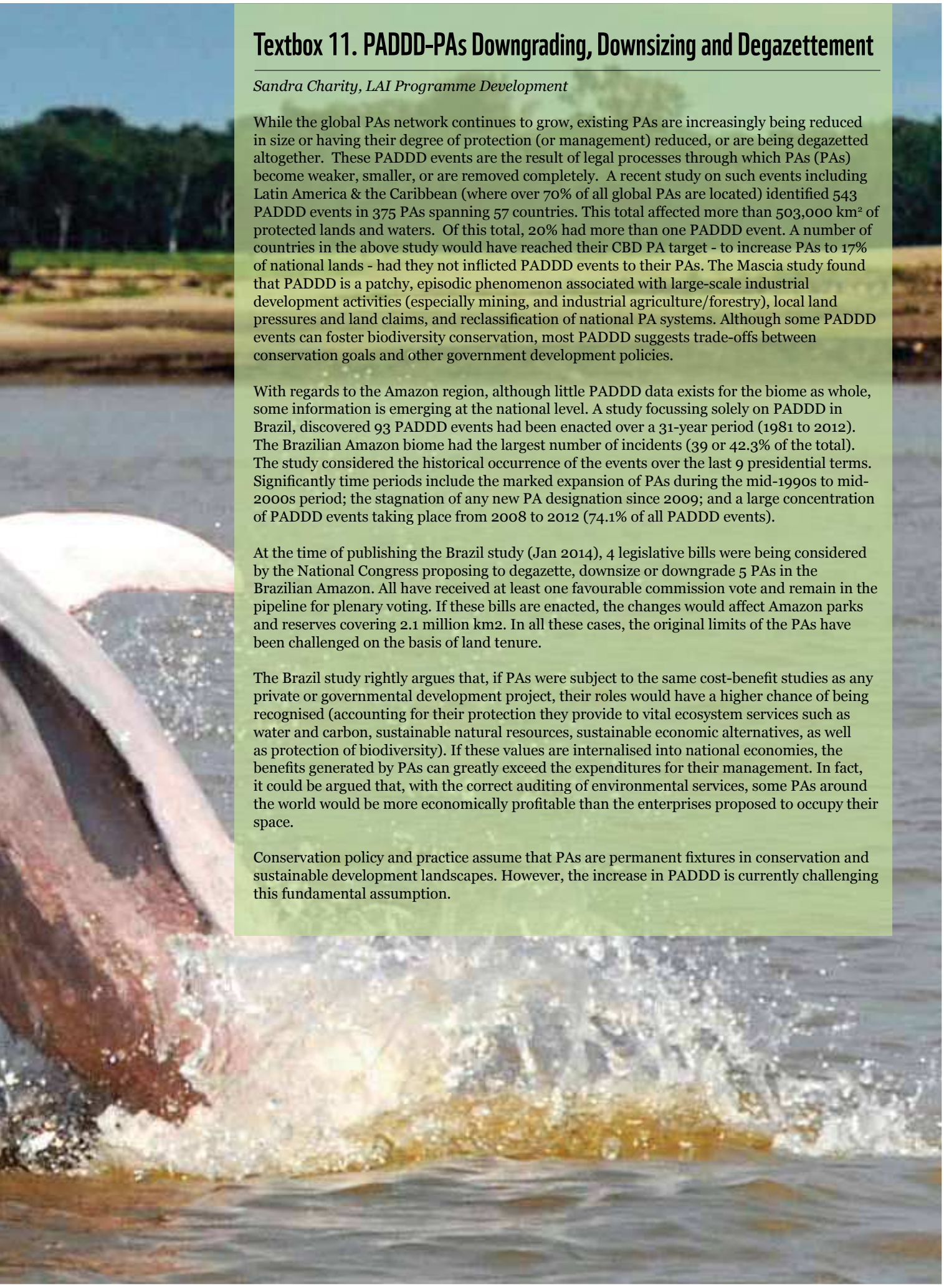
While the global PAs network continues to grow, existing PAs are increasingly being reduced in size or having their degree of protection (or management) reduced, or are being degazetted altogether. These PADDD events are the result of legal processes through which PAs (PAs) become weaker, smaller, or are removed completely. A recent study on such events including Latin America & the Caribbean (where over 70% of all global PAs are located) identified 543 PADDD events in 375 PAs spanning 57 countries. This total affected more than 503,000 km² of protected lands and waters. Of this total, 20% had more than one PADDD event. A number of countries in the above study would have reached their CBD PA target - to increase PAs to 17% of national lands - had they not inflicted PADDD events to their PAs. The Mascia study found that PADDD is a patchy, episodic phenomenon associated with large-scale industrial development activities (especially mining, and industrial agriculture/forestry), local land pressures and land claims, and reclassification of national PA systems. Although some PADDD events can foster biodiversity conservation, most PADDD suggests trade-offs between conservation goals and other government development policies.

With regards to the Amazon region, although little PADDD data exists for the biome as whole, some information is emerging at the national level. A study focussing solely on PADDD in Brazil, discovered 93 PADDD events had been enacted over a 31-year period (1981 to 2012). The Brazilian Amazon biome had the largest number of incidents (39 or 42.3% of the total). The study considered the historical occurrence of the events over the last 9 presidential terms. Significantly time periods include the marked expansion of PAs during the mid-1990s to mid-2000s period; the stagnation of any new PA designation since 2009; and a large concentration of PADDD events taking place from 2008 to 2012 (74.1% of all PADDD events).

At the time of publishing the Brazil study (Jan 2014), 4 legislative bills were being considered by the National Congress proposing to degazette, downsize or downgrade 5 PAs in the Brazilian Amazon. All have received at least one favourable commission vote and remain in the pipeline for plenary voting. If these bills are enacted, the changes would affect Amazon parks and reserves covering 2.1 million km2. In all these cases, the original limits of the PAs have been challenged on the basis of land tenure.

The Brazil study rightly argues that, if PAs were subject to the same cost-benefit studies as any private or governmental development project, their roles would have a higher chance of being recognised (accounting for their protection they provide to vital ecosystem services such as water and carbon, sustainable natural resources, sustainable economic alternatives, as well as protection of biodiversity). If these values are internalised into national economies, the benefits generated by PAs can greatly exceed the expenditures for their management. In fact, it could be argued that, with the correct auditing of environmental services, some PAs around the world would be more economically profitable than the enterprises proposed to occupy their space.

Conservation policy and practice assume that PAs are permanent fixtures in conservation and sustainable development landscapes. However, the increase in PADDD is currently challenging this fundamental assumption.



Pink river dolphin *(Inia geoffrensis)*

8.0 CONCLUSIONS

The Amazon is a 'conservation must' for local, national and global societies and governments. In addition to its unparalleled biodiversity, the Amazon provides an array of critical ecosystem services (including supporting, provisioning, regulating, and cultural services) and supports key aspects of human well-being (e.g. food and water security, health support materials, social cohesion of traditional communities). The main value of Amazon PAs to global societies is to assure the core of a larger, complex and interdependent system that provides ecosystem services through water regulation, climate regulation and the provision of raw materials. For the populations living in or around Amazon PAs, and for the Amazon countries themselves, these areas have direct economic and subsistence importance.

The Amazon plays a critical role in regional and global climate stability, not just because it locks carbon into its soils and vegetation, but due to its role in promoting air and moisture circulation (from the Atlantic Ocean to the eastern Andean slope and to the central and southern parts of South America, the so-called 'flying rivers' of the Amazon). The direct and indirect contribution of the Amazon to South America's economy is enormous and often underestimated. The region's abundance of natural resources is currently being exploited on an industrial scale. But the potential benefits derived from Amazon ecosystem services, from the extraction of its resources and the use of its soils and rivers has not always been felt by local dwellers. The economic development in the Amazon region varies greatly among the countries of the region. It is estimated that the Amazon regional GDP reaches US$330 billion dollars per year, of which the Brazil portion alone accounts for more than 70%. The annual average GDP per capita for the region is US$5,500 thousand dollars, but there is great variation between the countries.

While progress has been made in recent years to improve the standard of living in the region, on numerous indicators Amazonia's citizens remain poor. The stark reality is that the wealth created within Amazonia has enriched few Amazonians.

The Amazon Biome is suffering from increasing pressure on several fronts. Nature PAs – which, together with ITs and other community conserved areas (CCA) are among the most important defence mechanisms for biodiversity and sustainable ecosystem management – are themselves increasingly under threat from development projects, often resulting in their downgrading, downsizing or degazzettement, usually without any offsetting or compensation efforts. Political and physical threats to indigenous territories are also escalating. The loss of tropical rainforest and the services it provides has a profound and devastating impact on the world because rainforests are so biologically diverse and their ecosystem services so critical to mankind. If current deforestation rates of 2 million hectares per year continue, 25% could be lost by 2020.

Future deforestation projections range in severity; depending on the progress of control policies and voluntary market standards, deforestation levels could range between 25 to 50% between 2030 and 2050. Freshwater ecosystems are also under threat. The region has seen an intensification of human occupation and use of natural resources, including land, minerals, and sources of energy. Important geopolitical developments, related to the domination of the territory as a result of 'national security' (border) and 'national integration' policies, has seen the increased establishment of roads, settlements and military presence.

Protected Areas

This report considers mainly PAs that are included in national PA systems. (it includes some PAs with local community co-management and some subnational areas, but not local-level PAs or voluntarily established private protected areas, or non-recognised community conserved areas).

By 2013 the surface area in the Amazon under protection was significant, with 390 PAs, representing 25% of the Amazon biome, totalling some 167 million hectares. The number and total area encompassed by PAs in the Brazilian Amazon is impressive, and much larger than the other countries that share the rainforest, although this is relatively consistent with its larger share of the Pan-Amazon. Some countries (Brazil, Bolivia, Venezuela and Ecuador) have between 20 and 30% of their Amazon biome in nature PAs, while others (Colombia, Peru and Suriname) only have between 10 and 20% protected. However, the report concludes that despite this seemingly extensive coverage, ecological representation of the Amazon biome is neither sufficient nor adequate.

The area of the Amazon under protection increased slowly from 1960 until 1988, with modest increases in 1965, 1973-74 and 1978-79. The growth of the total protected area has significantly increased since 1990, with some remarkable jumps in total coverage taking place around 1990 and 2006. Unfortunately the pace of PA designation has reduced from the end of

the last decade, and since 2009 has been almost flat. Even worse, with the increased intensity of the drivers of habitat loss on several fronts, nature PAs and ITs (and similar areas) are under significant pressure, with an increased frequency of attempts to reduce or degrade them.

It is evident from the current status of PAs in the Amazon that there have been some important trends in the evolution of PA management. Greater attention has been given to creating groupings of PAs (corridors, mosaics, systems), both in geographical and in management terms. A more inclusive approach to PA designation by governments and the conservation movement has developed, as well as a greater interest and appropriation of conservation mechanisms by local communities and IPs.

In terms of IUCN's PA management categories, in the last decade there has been a shift in the policy focus of PA designation by Amazon countries from more strict preservation areas (Categories I-IV) in the 1980's (when almost 80% of protected areas were strict preservation areas) to sustainable use areas (now approximately 60% of all protected areas).

However, the challenges currently faced by Amazon PAs are often problems that come 'from within", such as poor design (particularly a failure to adequately represent freshwater ecosystems), poor management, conflicts with indigenous peoples and other local communities, and a lack of integration with regional, national and subnational sustainable development policies, plans and programmes, which over time could undermine the efforts and gains made so far, jeopardising the achievement of internationally-agreed social, economic and environmental goals and targets .

Better understanding is still needed on how to make systems of PAs fully functional and how to integrate them into national and regional development and land-use plans. PA systems are more than a collection of PAs, or a piece of legislation or a government policy; a fully functioning PA system is about cohesion, and involves training and exchange programmes, and interactions with other government sectors and policies (land use planning, infrastructure, energy planning, tourism, science, local communities' development, etc.) that lead to integrating PA systems into the wider development processes.

Indigenous Territories

Indigenous peoples and local communities have long been interacting with nature in the Amazon, with minimum impacts and many benefits. The Amazon is one of the best conserved natural regions on Earth, with large nature PAs and important mosaics. Indigenous territories have also played an important role. But, not all IPs (and other local communities) have seen their rights being respected and not all of their territories have been duly recognised, demarcated and enforced.

In terms of indigenous peoples' rights, this report follows a "non-restrictive" approach to defining indigenous territories that includes different denominations or types of ITs and similar areas (although a majority of the areas are ITs recognised by governments, there are significant numbers of proposed and of non-recognised areas).

In 2010 there were 3,043 ITs and similar areas within the Amazon Biome, although not all of them officially recognised, with a total of almost 208 million hectares. These areas represent 31.1% of the Amazon.

According to some indigenous peoples and as reflected in most country legislations, ITs are not established for nature conservation purposes per se. ITs are set up primarily to recognise the rights of indigenous peoples to land and natural resources for social, cultural and equity reasons, and are managed and utilised through a combination of traditional and new sustainable practices. However, they can also contribute to the conservation of nature and offer opportunities for reconnecting with nature through the lessons of their cosmogonies.

Ecological representation in the Amazon

Despite the expansion of nature PA networks across the Amazon, and regardless of whether they are considered collectively (for the entire region) or individually (as national PA systems), they still do not ensure sufficient ecological representation of Amazon ecosystems types. This report suggests that a minimum target of 30% of the Pan-Amazon area with good ecological representation will ensure that at least a core area is maintained for the continued provision of Amazon ecosystem services for the region and the world, including the mitigation of global climate change. This needs to be accompanied by efforts to maintain ecosystem processes and freshwater flows in about 60-70% of the Amazon, as well as reaching zero net deforestation by 2020and assumes a 20% maximum conversion area for climate purposes. This target should not be understood as 30% of the species or 30% of the ecosystems, but rather the best possible attempt, using proxies, to protect an ecologically representative sample of 100% of Pan-Amazon biodiversity.

The analysis of Amazon ecological representation based on terrestrial ecoregions, when considering only nature PAs, has found that when applying the the classic (and now outdated) 10% target, 31 out of 36 terrestrial ecoregions are sufficiently well represented. When considering the global average 17% target (Aichi Target 11), the number of ecoregions satisfactorily represented dropped to 22. If using WWF's recommended 30% target, only 10 ecoregions are sufficiently well protected. When the ITs and similar areas are included in the analysis, as expected, the ecological representation is increased. The 10% target is achieved for all ecoregions; the 17% target is achieved for 33 out of 36 ecoregions; and for the 30% target, there is a conservation gap in 7 ecoregions. The analysis of ecological representation based on freshwater heterogeneous units (or 'aquascapes') found that 39% of the 312 freshwater units/aquascapes are not represented in PAs, whereas 22% are not represented in either PAs or ITs. Only 65 freshwater systems/aquascapes (21%) have more than 30% of their range within PAs. However, if we consider PAs and ITs combined, almost half of them have more than 30% of their range protected.

Thus, through the assessment of ecological representation, it becomes easier to argue for higher ambition levels of protection targets, recognising their different purposes, roles and functioning rules. Unfortunately areas that are less well represented in the protection schemes are also those that have been most destroyed, degraded or are under the most conversion pressure. This highlights the urgency of assuring the minimum (30%) ecological representation before the biological diversity in these areas is lost forever.

In many countries the creation of new protected or sustainably managed areas is being put on hold, while threats to existing areas that are critical for climate change adaptation continue to grow. The situation is echoed for indigenous groups and their territories in the region. The development of hydroenergy and new road infrastructure projects are affecting the physical and legal integrity of PAs.

Nature PA systems represent the Amazon's 'biodiversity safety net'. Networks and blocks of well-designed and well-managed protected areas enhance the resilience of the region to the anticipated impacts of climate change. At the same time, recognition of indigenous peoples' rights and territories represents the 'ethical bottom line' for respecting and safeguarding the ethnic and cultural heritage of the Amazon, as well as enhancing the conservation gains made by PAs.

9.0 RECOMMENDATIONS

Recognising the role of nature PAs and ITs (and similar areas) within wider development planning contexts in the Amazon region helps to realise the gains made over the past 50+ years to establish and improve the management of PA systems and ITs. By engaging government actors in a regional dialogue for the adoption of an Amazon-wide vision, these lands can be mainstreamed into the development plans for the Amazon, enhancing negotiation leverage with private sector developers to limit the impact of large-scale projects such as dams and curb deforestation in the biome.

A key objective of WWF's Living Amazon Initiative is that ***by 2020 the national systems of PAs and a large proportion of indigenous people's territories in the Amazon countries are being effectively stewarded for conservation and sustainable development values. The aim is that these areas are fully integrated into the region's development agenda, ensuring ecological representation and ecosystem connectivity while maintaining and valuing the indispensable environmental, social and cultural values they provide***.

In order to achieve this ambitious objective, and to realign development in the Amazon region on to a more sustainable pathway, new measures are necessary to mitigate the threats and alleviate pressures currently facing the Amazon's network of PAs and ITs. Therefore, WWF, through its Living Amazon Initiative (LAI), proposes that the following key **recommendations** are adopted and implemented by decision makers in governments, the private sector and the wider societies in the 9 countries that share the Amazon biome (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela and France through the overseas territory of French Guiana), as well as by those in the wider global community:

- **1. Adopt a more integrated vision of sustainable development and nature conservation, where protected areas (PAs) are one part of a broader set of nature conservation strategies (biodiversity, ecosystem services, landscapes, aquascapes), development plans and economic policies.**
    - Integrate PAs into development plans/programmes and economic policies at the regional, national and subnational levels, including the recognition of the services they provide to societies and economies, but also implementing effective mechanisms to assure their long-term financial sustainability
    - Assess and realise the potential of PAs for poverty reduction in relevant national and subnational programmes.
    - Acknowledge that national systems of PAs (NSPA) are as important for sustainable development as other critical sectors such as education or health, ensuring that the priority given to these sectors is reflected in national budgets and institutional capacity. Given the importance of the environment to human wellbeing and eradication of poverty, NSPA should be the starting point for developing sustainable and responsible development strategies.

- **2. Fully implement the Aichi Targets, in particular Targets 5 and 12 and most especially Target 11, and collectively agree on an integrated approach to increase the ecological representation in the Amazon to 30% to ensure that a minimum representative area of Pan-Amazon ecosystems is effectively protected**.
    - Ensure a minimum of 30% protection in nature protected areas of Amazon terrestrial and freshwater ecoregions, as well as in their more detailed landscape and 'aquascape' units.
    - Complement the 30% coverage with other effective area-based conservation measures in addition to formal nature protection areas, in particular through the recognition and demarcation of indigenous territories (ITs) and other community conserved areas (CCAs), but also including privately managed and voluntarily established areas
    - Ensure that Aichi Target 11 is implemented in its entirety, including all the constituent elements of the target in addition to the 17% coverage (such as management effectiveness, equity, connectivity and integration into the wider landscapes and 'aquascapes'). This will ensure the maintenance of Amazon ecosystem services for the region and the world, including the mitigation of global climate change.

- **3. Increase the integration between PA systems, sub-systems and individual PAs, as well as between nature-based PAs and social/ethnic-based areas such as indigenous territories (ITs) and community conserved areas (CCAs), aiming to establish functional ecological networks (including ecological corridors).**
    - Improve governance of natural resource management and promote changes in production and consumption habits, including through learning from traditional knowledge of indigenous peoples and local communities.
    - Generate opportunities for new income streams from natural goods.
    - Create spaces for reducing social tensions and resolving conflict.
    - Design and manage protected areas (individual and sub-systems) in a way that helps to alleviate poverty of the people living within or around them; assist local communities to improve quality of life and living conditions; improve income-generation and distribution of benefits from their resources; and reduce the vulnerability of

susceptible local communities (poor, dependent on natural resources, exposed to natural hazards, with limited rights recognised or practiced).

4. Strengthen the implementation of a regional vision for the Amazon biome, including the establishment of ecologically-based and thematically related PA networks and transboundary PAs, as well as the implementation of exchanges and integration actions.

- Implement actions consistent with an Amazon Ecosystem-based Conservation Vision (including addressing conservation gaps, improving management effectiveness, achieving PA financial sustainability and ensuring local community participation) and support its improvement through acknowledging the roles of PAs in climate change mitigation and their incorporation into climate adaptation strategies.
- Replicate the successful case of the tri-national cooperation between Colombia, Peru and Ecuador, in the Putumayo basin, in other trans-boundary areas that might benefit from integration (such as in the Guiana Shield, Upper Negro River Basin, Amazon Headwaters, and the Andean-Amazon Piedmont).
- Promote and implement ecologically-based and thematically related networks of PAs such as those related to migratory fish, cross-boundary ecotourism programmes or collaborative agreements between cross-border research bases)

- **5. Promote greater international recognition of the Amazon as a global centre of biological and cultural diversity and provider of vital environmental services.**
  - Create strong and convincing communications on the arguments for sustainable development in the Amazon, including the need for further representation of sites promoted through internationally-recognised conventions and organisations, such as the Ramsar Convention on wetlands of international importance (Ramsar sites) and the World Heritage Convention under UNESCO (World Heritage Sites).

- **6. Use PAs for advancing science and technology research in order to effectively inform current models of development outside PAs and to shift production to a more sustainable productive matrix (based in the sustainable use of renewable resources).**
  - This could include open areas of agriculture, obstructing the free-flow of rivers for hydropower production, non-forest friendly road networks, among others, by bringing sustainable development models from the fringes of development planning to the mainstream of economic activities and to search new sustainable uses for biodiversity.

- **7. Fully recognise the rights of Amazon indigenous peoples and local communities in all Amazon countries, including recognition of ITs, community conserved areas (CCAs) and the sub-national political entities of the region.**
  - In particular, this includes those that live in territories awaiting legal recognition, traditional communities, and those that have a close relationship with and dependence on natural ecosystems. Acknowledge their rights to maintain a traditional way of life, cultural diversity and own cosmogony; the rights to land and access to natural resources, but also for the right to give or withhold their prior informed consent (according to each national legal framework) relating to activities that affect their way of life, lands and the associated natural resources. These peoples should receive support for the economic activities they carry out, such as 'extractivism' and fisheries, and should be assisted in integrating into the global economy if requested. Special attention should be given to indigenous peoples in voluntary isolation in order to respect and guarantee their decision to live as they decide.

- **8. Adopt national policies and programmes to control and avoid ecosystem conversion (including deforestation and river fragmentation) in under-represented ecoregions in the Amazon biome, and in particular, apply the 'non-regression principle' to prevent the downgrading, downsizing and degazzettement of PAs (PADDD) in the region.**
  - Explore and integrate effective approaches in all countries, aiming to achieve (a) zero net deforestation by 2020 and (b) limit ecosystem conversion across the Amazon to 20%. PAs should be here to stay and managed in an integrated way through landscape-level sustainable land-use plans.

- **9. Ensure that spatial and land use planning and management policies and practice integrate PAs and ITs alongside other forms of land use, communicating land tenure pressures effectively, and ensuring access by local communities and indigenous peoples to the natural resources they depend on.**
  - To this end, a diverse array of land use and management options are needed, ranging from strict protection to community-managed and including ITs, private conservation areas, and the sustainable use areas, each of which have different but complementary objectives, restriction levels and adaptations to development needs. These diverse land-uses are not mutually exclusive, but complement each other in their different functions.

- **10. Ensure adequate resourcing for the development of scientific knowledge needed for environmental monitoring in the Amazon**.
  - Particularly in relation to monitoring of ecosystem conversion (including deforestation and freshwater fragmentation), use consistent and standardised monitoring and analysis methods and sources across the Amazon biome.

- **11. Establish effective regulation and voluntary standards for public and private economic and financial activities in the Amazon region.**
  - This includes biodiversity and GHG offset procedures, considering the full array of ecosystem services provided by the ecosystems possibly affected.

Community engagement is vital in the sustainable management of the Amazon's rich natural resources. Juruena, Brazil

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FOR A LIVING AMAZON.

WWF's vision for the Amazon

An ecologically healthy Amazon Biome that maintains its environmental and cultural contribution to local peoples, countries of the region and the world, within a framework of social equity, inclusive economic development and global responsibility.

WWF Living Amazon Initiative (LAI)

Claudio Maretti, Leader

LAI Strategies

Strategy 1: Mainstream Protected Areas and Indigenous Lands into Regional Land Use and Development Plans
Tarsicio Granizo, Head
Julia Gorricho, Project Manager
Analiz Vergara, Officer

Strategy 2: Green Hydropower Development
Claudio Maretti (in charge)

Strategy 3: Curb Deforestation and Enable Forest Economy
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Amazon in numbers

100% RECYCLED

9
countries share the Amazon biome (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela and France through its overseas territory French Guyana)

6.7
million square kilometres is the area of the Amazon Biome, more than twice the size of India

385
indigenous groups; and 60 still living in voluntary isolation

90-140
billion metric tonnes of carbon stored in the Amazon rainforests

10%
of the world's known species diversity

34.1
million people living in the Amazon

100,000
kilometres of rivers and streams in the largest freshwater basin in the world

Why we are here
To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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