

INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY 22 May 2011



FOREST BIODIVERSITY

Earth's Living Treasure



Convention on
Biological Diversity

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22 May 2011

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International Biodiversity Art Competition, 2010.



INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY 2011: FOREST BIODIVERSITY



Jan L. McAlpine—Director of the United Nations Forum on Forests



Ahmed Djoghlaif—Executive Secretary, Convention on Biological Diversity

Forests contain some of our planet's most vibrant ecosystems, displaying a wondrous variety of birds, animals, and plants. Forests are the basis for more than 5,000 products, from aromatic oil distilled from leaves to herbal medicines, fuel, food, furniture and clothing; they prevent soil erosion and help to regulate the climate; they provide clean water; they inspire us in art, research and religion; and they are essential to the survival and well-being of people everywhere—all 7 billion of us.

Yet, the world's forests are facing immense pressures and challenges. Key findings from the Global Forest Resources Assessment 2010 show that while deforestation has slowed somewhat in recent years as compared to the 1990s, it is still alarmingly high. Continued deforestation has resulted in carbon emissions, shortages in water and food supply, and an unprecedented loss of biodiversity. But the world is not standing idly by. Governments, international organisations and forest stakeholder groups are taking action—to find ways of conserving and sustainably managing forests for the benefit of present and future generations.

This is why the United Nations declared 2011 as the International Year of Forests (Forests 2011), and why forests are the theme of the International Day for Biological



Diversity on 22 May 2011. In this special year, the United Nations Forum on Forests (UNFF) and the Secretariat of the Convention on Biological Diversity (CBD) are working together to highlight the importance of forest biodiversity to humankind. The theme for Forests 2011 is “Forests for People”, celebrating of the central role of people in the management, conservation, and sustainable development of our world’s forests.

This booklet aims to raise awareness of the threats and challenges faced by forests and to promote efforts for forest conservation and sustainable management. Maintaining the world’s rich forest biodiversity will help us combat the climate crisis, alleviate poverty, support human health, and leave our children and grandchildren the bountiful and beautiful legacy of living forests that we enjoy today. Clearly, no task could be more timely or important. The new Strategic Plan of the CBD aims to at least halve the rate of deforestation by 2020, and where possible bring it close to zero; restore 15 per cent of degraded forests; manage all forests sustainably; and increase the coverage of protected areas to 17 per cent. Achieving these ambitious targets will require decisive action and close collaboration at all levels. At UNFF and CBD, we look forward to working with the international community to ensure that our constituencies are fully empowered to move towards a better future for forests and people.

Jan L. McAlpine

Director, United Nations Forum on Forests

Ahmed Djoghlaif,

Executive Secretary,
Convention on Biological Diversity

INTERNATIONAL YEAR OF FORESTS



The United Nations proclaimed 22 May as the International Day for Biological Diversity to promote a greater understanding and awareness of biodiversity issues.

The theme of the 2011 International Day for Biological Diversity is forest biodiversity. The Secretariat of the Convention on Biological Diversity (CBD Secretariat) encourages governments and civil society everywhere to organize activities and events to celebrate this day, raise public awareness, showcase good practices and inspire further actions for preserving forest biodiversity.

How to get involved

The CBD Secretariat encourages all Parties to the Convention and all organizations that deal with forest biodiversity to organize activities and events to celebrate the International Day for Biological Diversity 2011. Resource material is available on the websites of the member organizations of the Collaborative Partnership on Forests (see information at the end of this brochure), as well as on the CBD website: www.cbd.int/idb

Resource material on forest biodiversity for **schools, educators and students** is available at <http://greenwave.cbd.int> or can be ordered at secretariat@cbd.int

Please inform the CBD Secretariat of your International Day for Biological Diversity activities by e-mail (secretariat@cbd.int) or fax: +1 514 288 6588, to ensure that information about your activity is posted on the CBD website.

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WHAT'S IMPORTANT ABOUT FORESTS

1. Forests are more biologically diverse than any other land-based ecosystem. Conserving and sustainably using our forests protects more than two-thirds of all land-based animal and plant species.
2. Biodiversity underpins the health and vitality of forests and is the basis for a wide range of ecosystem services necessary for people's livelihoods and well-being.
3. Rich forest biological resources, used wisely, can generate invaluable economic, social and cultural benefits. Destroying this natural treasure has far-reaching consequences for people, particularly for the many poor people who depend on forests for their livelihoods.
4. Forests are disappearing partly because they are undervalued, and our market economy fails to recognize ecosystem services provided by intact forests. To stop losing this planet's living treasure, we must understand and appreciate its full range of values, as well as its importance for human well-being and development.



5. Forest biodiversity can be successfully conserved and sustainably used where there is sufficient political will. People are taking action at local, national and regional levels to save forest biodiversity around the globe. Exchanging experiences and success stories is important to keep momentum for these efforts.
6. Biodiversity of degraded forests can often be successfully restored if the factors that lead to forest degradation can be effectively controlled. Restored forest landscapes provide food, water, shelter and many other essential ecosystem services.
7. People throughout the world can directly influence the fate of forest biodiversity through their individual choices. Consumers have a responsibility for sustainable behaviour and for limiting their ecological footprint. The final chapter of this brochure provides some information on individual actions.



KEY FACTS

- Forests cover about 31 per cent of the land on Earth, around 4 billion hectares, and contain more than two-thirds of the world's terrestrial species. The Amazon basin alone is home to an estimated 25 per cent of all land-based species.
- 53 per cent of the world's forests are found in just five countries: Brazil, China, Canada, the Russian Federation, and the United States of America.
- More than 1.6 billion people depend on forests for their livelihoods; forests are home to an estimated 300 million people around the world.
- 80 per cent of people in developing countries rely on traditional medicines, up to half of which originate from plants found mainly in tropical forests.
- Forest biodiversity is the basis for more than 5,000 commercial products, from aromatic oil distilled from leaves to herbal medicines, food and clothing.
- Three quarters of the world's accessible fresh water comes from forested watersheds; forests purify drinking water for two-thirds of the major cities in developing countries.
- Forest biodiversity is being lost at an alarming rate: up to 100 animal and plant species are lost every day in tropical forests.
- 36 per cent of the total forest area is covered by primary forests—i.e. forests comprised of native species where the ecological processes have



not been significantly disturbed by human activity. Primary forests have decreased by more than 40 million hectares since 2000, mostly due to logging and agricultural expansion.

- The rate of deforestation has slowed somewhat over the past decade; yet each year, approximately 13 million hectares of the world's forests, an area the size of Greece or Nicaragua, are lost or degraded. Deforestation and forest degradation in primary tropical forests, which are of high biodiversity value, continue at an alarming rate: around 6 million hectares per year.
- Emissions resulting from deforestation and forest degradation may contribute more than 15 per cent to annual global greenhouse gas emissions.
- It is estimated that up to one billion hectares, or about one quarter of all forest lands, are in need of restoration to improve their productivity and delivery of ecosystem services; restoring these forest landscapes would have enormous benefits for sustainable development.
- Globally, more than 460 million hectares of forests, 12 per cent of the total forest area, are designated for the conservation of biodiversity as their primary function, an increase of 32 per cent since 1990.

Did you know?

The tallest tree in the world: a coast redwood (*Sequoia sempervirens*), which stands 115.55 m tall

The largest tree in the world: a giant redwood (*Sequoiadendron giganteum*) called "General Sherman," with a volume of 1487 m³

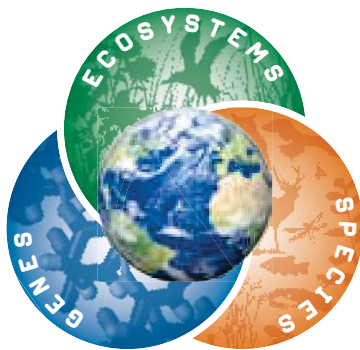
The oldest known living tree in the world: a great bristlecone pine (*Balfouriana*) called "Methuselah," which is around 4,850 years old

All three trees stand in California, United States of America.



INTRODUCTION

Biological diversity, or biodiversity in short, is a term used to describe the diversity of life at three different levels: genes, species and ecosystems. Central to the concept of biodiversity is the understanding that all organisms interact, like a web of life, with every other element in their local environment. For example, the term “rainforest” describes a broad type of forest ecosystem characterized by high rainfall and a great diversity of species. There are many other types of forest ecosystems, each characterized by a variety of different species with different genes and different environmental conditions.



What is “biodiversity”?

Biodiversity (short for “biological diversity”) is the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

“Ecosystem” means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

— *Convention on Biological Diversity (CBD), Article 2*

Forests are amazingly rich in biodiversity. It is estimated that two thirds of all land-based species live in forests, or depend on them for their survival. Presently, around 1.75 million species of plants, animals and fungi are known to science. However, it is estimated that there could be up to 100 million species, most of them in tropical rainforests.

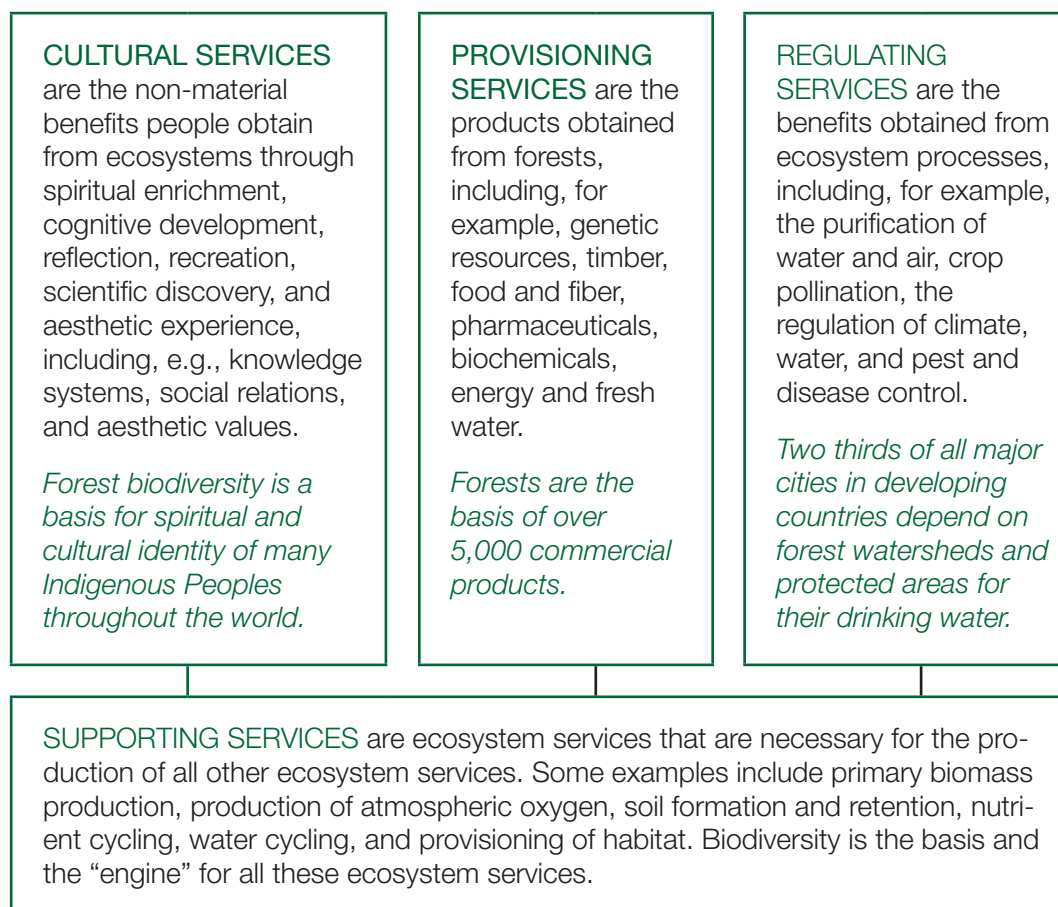


The rich tapestry of life on our planet is the outcome of over 3.5 billion years of evolution. It has been shaped by forces such as changes in the planet's crust, ice ages, fire, and interaction among species. Now, it is increasingly being altered by humans.... About 45 per cent of the Earth's original forests are gone, cleared mostly during the past century.

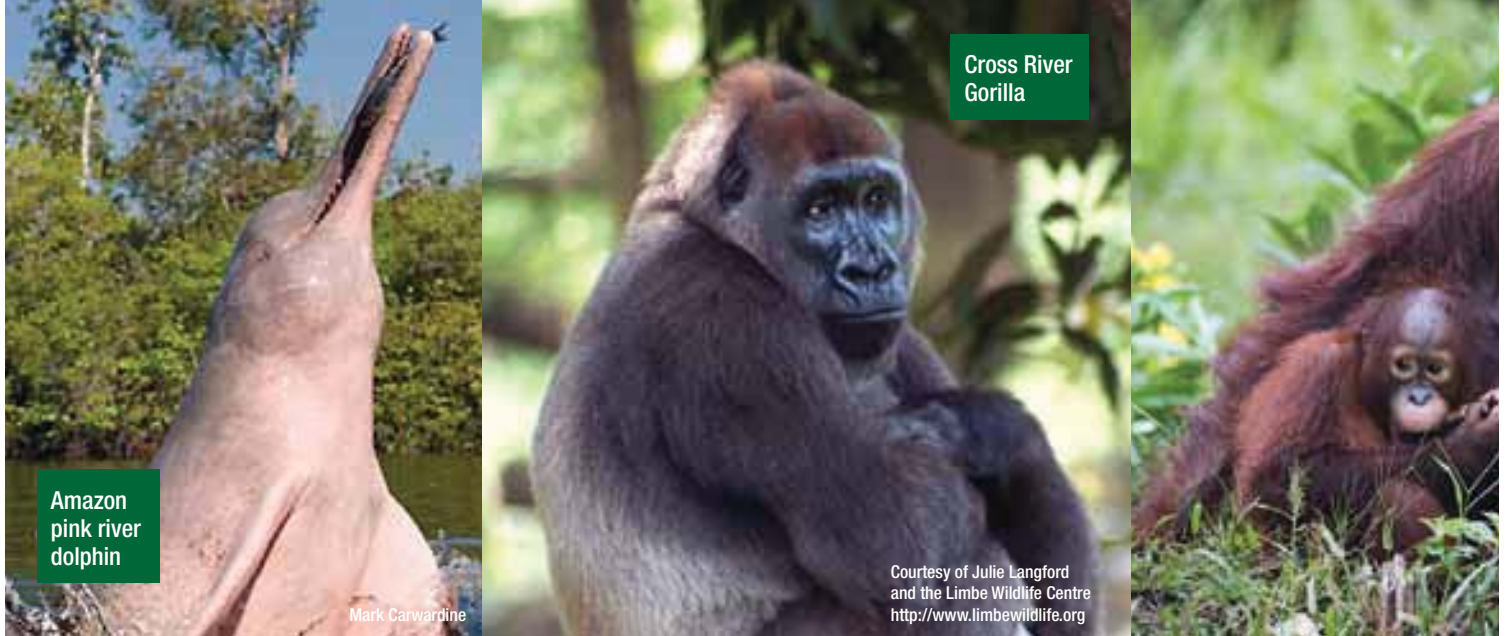
— Convention on Biological Diversity (CBD)

Forest biodiversity sustains human well-being through a multitude of ecosystem services, such as water purification, provision of oxygen, and spiritual and cultural benefits. For many indigenous communities, forest biodiversity is fundamental to their culture and identity (Figure 1).

FIGURE 1: Examples of ecosystem services provided by forest biodiversity



(Source: Millennium Ecosystem Assessment / GreenFacts, 2005)



Mega-diverse forests

The forests of the tropics are among Earth's most diverse ecosystems. The **Amazon rainforest** is the largest rainforest in the world, stretching over 800 million hectares and spanning nine countries. The Amazon basin sustains the world's richest diversity of birds, freshwater fish and butterflies, and it is estimated that one quarter of all land-based species can be found here. It is, for example, the habitat of rare species such as jaguars, harpy eagles and pink river dolphins.

At the heart of the African continent, the tropical forests of the **Congo basin** cover an area of more than 400 million hectares, and provide a mosaic of ecosystems – rivers, forests, swamps and flooded forests—which are teeming with life. The Congo Basin forests are sanctuary for forest elephants, gorillas and other wildlife under towering canopies of ancient trees. The Cross River Gorilla (*Gorilla gorilla diehli*), found in the Congo basin rainforests on the border between Nigeria and Cameroon, is one of the most endangered primates in the world, with only around 300 individuals surviving in the wild.

The islands of **Borneo and Sumatra** harbour some of the world's most diverse rain forests and Southeast Asia's last large-scale primary forests. The islands' tropical climate and diverse ecosystems have created habitats for a vast array of life. The forests of Borneo and Sumatra are some of the most biologically diverse habitats on Earth, possessing staggeringly high numbers of unique plant and animal species. Once described by Charles Darwin as “one great luxuriant hothouse made by nature for herself,” the forests of Borneo are home to more than 200 species of mammals, including elephants, orangutans, clouded leopards and rhinoceros, more than 350 bird species, 150 reptile and amphibian species, and a staggering 10,000 plant species.



Native to Indonesia and Malaysia, orangutans are currently found only in rainforests on the islands of Borneo and Sumatra. The word “orangutan” comes from the Malay words “orang” (man) and “(h)utan” (forest), hence, “man of the forest”.



Tree species and their gene pools are often highly adapted to specific environments, such as these baobab trees in sub-Saharan Africa, which can store water inside the swollen trunk (up to 120,000 litres) to endure the harsh drought conditions particular to seasonally arid areas. To conserve water, they shed their leaves during the dry season.

Conservation of tree species



© Cristóbal Alvarado Minic, flickr.com

Many valuable tree species are at risk of extinction, such as the roughbark *Lignumvita* (*Guaiacum officinale*), which is listed under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), www.cites.org

Although threats to the survival of charismatic forest-dwelling species such as tigers and giant pandas are well known, not many people are aware of the perilous situation of some of the world’s trees. The World List of Threatened Trees (1998) indicates that more than 8000 tree species, 10 per cent of the world’s total, are currently threatened with extinction.

Many economically important tree species, including some species of pine, oak, fir, cedar, mahogany and meranti, are threatened due to unsustainable use. More than one in six mangrove species worldwide is on the IUCN Red List of Threatened Species. They are in danger of extinction because of such factors as coastal development, climate change, logging and agriculture.

To promote the conservation of tree species, the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-

WCMC) initiated a Global Tree Conservation Atlas in 2003, which presents profiles of threatened tree species around the world in a map-based format (<http://www.unep-wcmc.org>).

The United Nations Food and Agriculture Organization (FAO) is currently preparing the first-ever report *State of the World’s Forest Genetic Resources*. Scheduled to be published in 2013, the report will be the most comprehensive effort undertaken to date to map the genetic diversity of trees and other forest resources (<http://www.fao.org/nr/cgrfa/cgrfa-global/cgrfa-globass/en/>).



VALUING FOREST BIODIVERSITY

Life has value and meaning beyond monetary measure, and so does biodiversity. While it is not really possible to put a monetary figure on the value of forests, it is now widely recognized that we need to improve the way our societies and economies account for ecosystem services. We often take these services for granted, such as the ability of the forest to filter water or produce oxygen. Human well-being depends on the goods and services provided by nature—Earth’s “natural capital”. Recent initiatives, such as the global study on ‘The Economics of Ecosystems and Biodiversity’ (TEEB) have resulted in a better understanding of the economic value of forests and other ecosystems for societies.

Biodiversity has intrinsic value, and there are ecological, aesthetic, spiritual, cultural, moral and economic reasons to conserve it.



World Resources Institute

The Earth’s “natural capital”

The TEEB study estimates that, on average, one hectare of tropical forest provides US\$ 6,120 per year in ecosystem services, such as watershed protection, climate regulation, soil stabilization, coastal protection, nutrient cycling, and carbon storage (see Table 1). This also includes the numerous products from tropical forests, such as timber, wild food and non-timber forest products—rubber, oils and fibres that are economically impor-

Forests support human well-being



tant both locally and nationally in many tropical forest countries. Yet, only a fraction of this value is currently accounted for when we make economic decisions about the future of forests. The Green Economy Initiative of the United Nations Environment Programme (UNEP) and other efforts are now underway to improve the way we value and account for nature in our economic decision-making.

TABLE 1: Values of ecosystem services in tropical forests

ECOSYSTEM SERVICE	VALUE OF ECOSYSTEM SERVICES (US\$/ha/year – 2007 values)	
	Average	Maximum
Provisioning services		
Food	75	552
Water	143	411
Raw materials	431	1 418
Genetic resources	483	1 756
Medicinal resources	181	562
Regulating services		
Influence on air quality	230	449
Climate regulation	1 965	3 218
Water flow regulation	1 360	5 235
Waste treatment/water purification	177	506
Erosion prevention	694	1 084
Cultural services		
Recreation and tourism opportunities	381	1 171
TOTAL	6 120	16 362

(Source: TEEB Climate Issues Update 2009)



Tropical forests pump water into the atmosphere, sending rain to areas as far away as Europe and North America, as this analysis of rainfall patterns by the U.S. National Center for Atmospheric Research shows.

Payments for ecosystem services—a new approach

Often the people who benefit from ecosystem services are not the people who help maintain the ecosystem. The “payments for ecosystem services” approach provides a way to transfer resources from beneficiaries of ecosystem services to the maintenance of ecosystem functions. Today, this approach has inspired new incentives and innovative financing for ecosystem protection. Increasingly, this includes payments for the protection and maintenance of forest watersheds, such as the Catskill mountain range in New York State, the source of most of the drinking water for New York City (more information: <http://www.nycwatershed.org/>).



Karen White

Globally, standing forests are able to remove about 15 per cent of human-generated carbon dioxide emissions from the atmosphere every year by sequestering carbon; in so doing, they become “carbon sinks”. In addition, tropical forests can also “cool” the Earth by evaporating huge volumes of water and creating clouds that reflect sunlight back into space. The Amazon rainforest alone releases around 8 trillion tonnes of water vapour to the atmosphere each year.

Biologically diverse ecosystems not only maintain but lead to an increase in the flow of ecosystem services. The TEEB study estimates that the world’s national parks and protected areas generate wealth via nature-based goods and services equal to around US\$ 5 trillion per year.

On the other hand, over-harvesting ecosystem goods will lead to deple-



tion in natural capital and ultimately dry up the supply of both ecosystem goods and services. It is estimated that the measurable cost of the loss of biodiversity is between US\$ 1–4 trillion per year. To adapt to the impacts of climate change and ensure the reliable provision of ecosystem services, it will be vital to maintain ecosystems that are biologically diverse.

“Insurance” against climate change

Intact forests can provide cost-effective “insurance” against the impacts of climate change. For example, nature can defend coastal communities against the effects of storms and natural disasters if coastal ecosystems are intact. Compared to hard infrastructure such as seawalls and levees, restoring mangrove forests is much more affordable for protecting large coastal areas and requires less maintenance. Additional benefits include providing communities with food, raw materials and livelihoods as well as other benefits from biodiversity.

- **Viet Nam** planted 12,000 hectares of mangroves (1994-2002) at a cost of **US\$ 1.1 million** in total, but saved annual levee maintenance costs of **US\$ 7.3 million**, shielded inland areas from typhoon Wukong in 2000, and restored livelihoods based on planting and harvesting shellfish.
- In **Malaysia**, the coastal protection provided by the existing mangroves could have cost **US\$ 300,000** per kilometre if replaced with artificial structures. Mangroves also provide local populations with a



Mangroves:
a natural
“coastguard”

Roly Guti

source of fish and game, firewood, medicines, tannins and fodder for livestock. Mangrove forests are also important spawning grounds and nurseries for marine fish stocks.

There are many similar examples of the role of forests in climate change adaptation, related to disaster reduction, water security, food security, and human health. The CBD Secretariat has compiled a list of examples in its Technical Series no. 41 *Biodiversity and Climate Change Mitigation and Adaptation*, available at www.cbd.int.

Mitigating risks of flood and drought

The trunks and roots of trees control the flow of surface and ground water into river systems, which in turn helps regulate cycles of flood and drought. By recycling water vapour back into air currents, forests help to maintain rainfall regimes over vast areas. For example, much of the rainfall in the Andes that provides high-altitude populations with drinking water and feeds glaciers has been recycled over lowland Amazonian forests.

Forests also protect soils, reduce erosion rates and slow the delivery of sediment to rivers. Forests and trees combat land degradation and desertification by stabilizing soils, reducing water and wind erosion and maintaining nutrient cycling in soils.



Underwater world: mangrove forests are important spawning grounds for fish

Courtesy of Katie Fuller and the Marine Photobank



Eko Bambang Subiyantoro

Intact forests can purify, store and gradually release freshwater. Two-thirds of all major cities in developing countries depend on protected areas, mostly forested watersheds, for their water supply.

Support for people's livelihoods

Forests, with their rich biodiversity are essential for human livelihoods and for sustainable development. For example, fuelwood is the primary source of energy for heating and cooking for an estimated 2.6 billion people. The World Bank estimates that forests directly contribute to the livelihoods of some 90 per cent of the 1.2 billion people living in extreme poverty. The Millennium Ecosystem Assessment also found that as many as 300 million people, many of them very poor, depend substantially on forest ecosystem services for their subsistence and survival. Many non-timber forest products derived from forest biodiversity, such as wild cocoa,

Forests for human health – deforestation and the spread of diseases

Undisturbed tropical forests can play an important role in moderating the effects of infectious diseases. In deforested or heavily degraded areas in the tropics, the risk of malaria infection has been found to be as much as 300 times higher compared to areas of intact forest, because degraded forests have more shallow water pools as breeding grounds for mosquitoes and other disease vectors, and because natural predators of insects, such as birds, are less frequent than in intact forests¹.

¹ Cf. J.A. Foley et al., 2007: *Amazonia revealed: forest degradation and loss of ecosystem goods and services in the Amazon Basin*. *Frontiers in Ecology and the Environment*.



honey, gums, nuts, fruits, flowers, seeds, rattan, fungi and wild meat and berries are essential for the food, medicine and building material used by indigenous and local communities to sustain their way of life, including their culture and religious traditions.

Bees, forests and people

Forest biodiversity can boost agricultural productivity. Bees and other forest insects pollinate agricultural crops such as coffee, and as a result they help increase yields of seeds and fruits, as well as provide honey, beeswax and other valuable sources of food and income. Bee pollination plays a role, in one way or another, in the production of about one third of all the plants or plant products in our diet and more than half of the fat and oil derived from oilseeds. Bees not only contribute to plant reproduction, but also to the vitality and diversity of the forest ecosystem.

Forest genetic resources and the fair and equitable sharing of benefits

One of the CBD's three fundamental objectives is the fair and equitable sharing of benefits arising out of the utilization of genetic resources. Genetic resources are of interest in scientific research and in the development of commercial products in a variety of sectors, including pharmaceutical, biotechnology, cosmetic and seed and crop industries. In many cases, users of genetic resources consult indigenous and local communities on their traditional knowledge of biodiversity for leads in identifying useful properties of genetic resources. Such

A *Trigona scaptotrigona* bee on a coffee flower. Coffee plants benefit from the pollination provided by forest insects, as well as from the shade and micro-climate of nearby forests.

© courtesy of Eric Tournere/ www.TheBeePhotographer.com

Sustainable livelihoods:
fishing in mangrove forests.

information can enable industries to develop new products for the benefit of humankind and have helped scientists better understand biodiversity.

Access and benefit-sharing refers to the way genetic resources are accessed and how users and providers reach agreement on the sharing of benefits that may result from their use:

- Users seeking access should get permission from the provider country (known as prior informed consent or PIC)
- Users and providers should negotiate an agreement to share resulting benefits (known as mutually agreed terms or MAT)

Whenever traditional knowledge associated with genetic resources is used, the prior informed consent of the indigenous and local communities concerned must be obtained and mutually agreed terms for the sharing of benefits with these communities must be established.

In 2010, at its tenth meeting, held in Nagoya, Japan, the Conference of the Parties to the CBD adopted the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization* which regulates the relationship between providers and users of genetic resources within and across scientific and economic sectors. The Protocol ensures the sharing of benefits with biodiversity-rich developing countries through technology transfer, research results, training and profits. As some of the world's most biologically diverse ecosystems, forests harbour a diverse pool of genetic resources whose use may be affected by the new Protocol.



In 2005 the global sale of pharmaceuticals sourced from animals, plants or micro-organisms reached US\$ 14 billion.

Access and benefit-sharing in practice

Access and benefit-sharing can be manifested, for example, through the use of non-timber forest products. The bark and stemwood of the mamala tree (*Homalanthus nutans*) in Samoa contain a gene that naturally produces Prostratin, the active compound containing anti-viral properties. For many years, traditional Samoan healers made tea with this tree and used it to cure people with hepatitis. An ethnobotanist from the University of California at Berkeley studying traditional Samoan medicine sent some samples of the tree to be tested against HIV. When the researchers isolated Prostratin in the laboratory, they discovered that it stopped cells from being infected by the virus and it forced the virus outside the body's immune cells and into the line of fire of other HIV-fighting drugs. Before sending the samples of the tree for testing, and before further development of Prostratin, the users followed PIC and MAT principles and agreed to give back a substantial percentage of the net revenue arising directly out of the research to the Samoan people. Funds have also been supplied to local villages, for example for schools, medical clinics, water supplies and an endowment for the local rainforest.

Sustainable use: linking people and forests

Forests can provide multiple benefits to society as long as they are not overexploited. The concept of sustainable use of biodiversity is essential in this regard: it means that forest species, ecosystems and genes are used in a way and at a rate that does not lead to the long-term decline of biodiversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. Sustainable use is a cross-cutting issue in all aspects of the Convention on Biological Diversity (CBD), as it relates to many policy areas and activities at local, national, regional and international levels. The CBD also specifically protects and encourages customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements. Customary sustainable use of forest biodiversity, such as hunting, is often essential for the subsistence and for the cultural and spiritual identity of many indig-



enous and local communities. Studies suggest that, in many cases, forests owned or managed by indigenous and local communities are among the most effectively conserved and most sustainably managed.

The Satoyama Initiative: for biodiversity and human well-being

In October 2010, the Conference of the Parties to the CBD recognized the *Satoyama* Initiative as a potentially useful tool to better understand and support human-influenced natural environments for the benefit of biodiversity and human well-being. The *Satoyama* Initiative, initiated and supported by the government of Japan, promotes and supports socio-ecological production landscapes, which have been shaped over the years by the interaction between people with nature. The Initiative aims to realize societies in harmony with nature where both biodiversity and human well-being are maintained harmoniously, by providing a platform for cooperation, learning, and support.

Kanakura, known as a peaceful community in Japan, is an excellent example. Kanakura's seasonally varying scenic beauty, its biodiversity, and local forms of sustainable land use have formed its traditional landscape and culture, including aquatic, agricultural and forest ecosystems, and elements of history of the local community, walking paths, local specialties, events and social networks. Establishing and maintaining such sustainable socio-ecological production landscapes benefits people and biodiversity (<http://satoyama-initiative.org/>).



Satoyama: living in harmony with nature

United Nations University—Institute of Advanced Studies



Indigenous ceremony, Papua New Guinea

Courtesy of Eric Lafforgue Islas



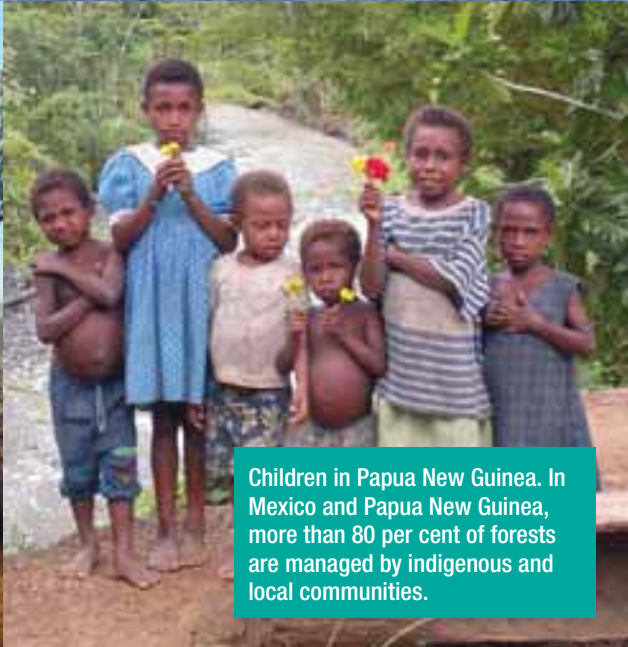
Boreal forest in Mietoinen, Finland

EtäKärppä



Bushfire in Kakadu National Park, Northern Territory, Australia

Thomas Schoch



Children in Papua New Guinea. In Mexico and Papua New Guinea, more than 80 per cent of forests are managed by indigenous and local communities.



Community forest management, traditional knowledge and customary sustainable use

Globally, four to eight million square kilometres (the larger estimate is an area bigger than Australia) are owned or administered by local communities. In 18 developing countries with the largest forest cover, over 22 per cent of forests are owned by or reserved for communities. In some of these countries (for example Mexico and Papua New Guinea) the community forests cover 80 per cent of the total. By no means all areas under community control are effectively conserved, but a substantial portion of them are. In fact, some studies cited in the *Global Biodiversity Outlook* (2010) show that levels of protection are actually higher under community or indigenous management than under government management alone.

Traditional knowledge refers to the knowledge, innovations and practices of indigenous and local communities around the world. Most indigenous and local communities are situated in areas where the vast majority of the world's biological diversity is found. Many of them have cultivated and used biological diversity in a sustainable way for thousands of years. Some of their practices have been proven to enhance and promote biodiversity at the local level and aid in maintaining healthy ecosystems. However, the contribution of indigenous and local communities to the conservation and sustainable use of biological diversity goes far beyond their role as natural resource managers. Their skills and techniques provide valuable information to the global community and a useful model for biodiversity policies. Furthermore, as on-site communities with extensive knowledge of local environments, indigenous and local communities are most directly involved with in-situ conservation and sustainable use.

For example, many indigenous and local communities have developed ways to maintain, encourage and even increase biological diversity on their traditional territories through fire management. Traditional fire management practices in the wet tropics of far northern Queensland, Australia, for instance, have increased the biological diversity in forest areas by encouraging grazing animals, such as kangaroos and wallabies, into the open grassy clearings in the rainforest, created by burnings. Also, small marsupials such as the Northern Bettong are dependent on fungi and mushrooms that grow on the edges of clearings of this type without these practices, the Bettongs soon disappear. Such practices are now being considered and implemented, on a broad scale, often as partnerships between indigenous peoples and protected-area authorities. Fire management is such a long established practice in the traditional Australian landscape that many plant seeds, such as wattle bush, have evolved in such a way that they will not germinate until they are exposed to fire. However, hot wild fires will kill them. Their germination requires what is referred to as a "cool fire", which is the result of regular and controlled burning of the bush without excessive build up of under-brush.



THREATS AND CHALLENGES

Deforestation and forest degradation

Deforestation is a major cause of biodiversity loss. It continues at an alarming rate, mostly driven by agricultural expansion. Each year, from 2000 to 2010, around **13 million hectares** of forest around the world were converted to other uses or degraded, down from 16 million hectares annually from 1990 to 2000.

While the net loss of forests has slowed in the past decade—mainly due to large-scale tree planting in temperate regions and to natural forest expansion—deforestation is still a major problem. The *Global Forest Resources Assessment* (2010) concluded that **the rate of deforestation has slowed down slightly in the past decade**, mostly due to reforestation. However, this does not necessarily signal good news for biodiversity, since newly planted forests that may replace old-growth forests often have low biodiversity value and may include very few tree species.

Degraded forests are forests that have lost some of their original capacity to provide ecosystem services. They are more vulnerable to outbreaks of pests, diseases and climate change. Forest degradation also reduces the long-term ability of a forest to absorb carbon from the atmosphere. The Global Partnership on Forest Landscape Restoration estimates that up to 1 billion hectares of forest landscapes, equivalent to around one quarter of all forest lands, are degraded and in need of restoration. Successfully restoring these forest landscapes would have enormous benefits for people and biodiversity.

Primary forests include some of the world's most species-rich, diverse terrestrial ecosystems. Primary forests have shrunk over the last ten years by



about 40 million hectares, at a rate of around 0.4 per cent every year, often due to conversion to agricultural land use, such as oil palm plantations or cattle ranching, following a period of selective logging.

Impacts of climate change

Climate change affects forest growth and can cause forest “dieback”, the large-scale collapse of forests and their possible transformation into an altered and degraded state, for example the transformation of a sub-tropical forest into a savannah landscape. Climate change also affects the dynamics of forest biodiversity; the distribution of indigenous species changes, there is a proliferation of invasive species, and the seasonal patterns in ecosystem processes are altered. The application of sustainable forest management (SFM) practices can increase the resilience of forests to cope with climate change impacts, for example by increasing structural diversity, and diversity of species and genes in managed forests.

Forests are sensitive to climate change. Even a change in temperature of as little as 1° C can modify the functioning and composition of forests. For example, boreal forests are already severely affected by climate change. The temperature increase has caused a large-scale outbreak of pine beetles in Canadian boreal forests during the last decade, resulting in substantial forest die-back. It is believed that large-scale forest fires in the Russian Federation in 2010 can also be attributed to climate change.



Forest fires are expected to increase as a consequence of climate change

Tipping points: What happens if the climate changes too much?

Forest resilience has its limits. If environmental pressures are too severe, a “tipping point” is reached, whereby an ecosystem changes drastically into an altered and degraded state. A well-studied case is the projected dieback of Amazon rainforest. Two interacting tipping points could result in widespread dieback of humid tropical forest in the Amazon:

- 1 Conversion of forest to agricultural land and fires alter regional rainfall and increase drought. Forest fragmentation and drought are projected to increase the susceptibility of forests to fire and dieback, leading to a vicious cycle in which fire and dieback become increasingly widespread.
- 2 Some climate models project substantial reductions in rainfall for the Amazon. Reduced rainfall combined with rising temperatures result in forest dieback and reduced transfer of water to the atmosphere, setting off feedbacks that lead to a drier climate in which humid tropical forest is permanently replaced by dry forest, shrub and/or grass-dominated vegetation.

A recent study of the combined impacts of these two processes suggests that parts of the Amazon may already be close to a forest dieback tipping point.

The Amazon forest, especially at its western edge, is one of the most species-rich areas of the world. Widespread dieback of these humid tropical forests would lead to major reductions in species abundance and extinctions. Moreover, widespread fires and forest dieback could lead to massive degradation of sustaining and regulating ecosystem services, such as losses of carbon stored in vegetation and soils, which would be large enough to significantly influence atmospheric CO₂ concentrations and global climate, while at the same time reducing the amount of oxygen produced by this area.

There is substantial uncertainty in the land use tipping point mechanism, but several modelling studies suggest there is a significant risk of dieback when deforestation exceeds 20 to 40 per cent of the original forest area.

A precautionary approach would suggest that deforestation should not exceed 20 per cent of the original forest area, fire for clearing should be minimized and global climate warming should be kept below 2°C in order to avoid this tipping point. This will require concerted efforts to implement sustainable agricultural practices, establish large protected areas, reduce national and global pressures for increased meat and animal feed production, etc. Application of REDD-plus initiatives (see box on p. 36) could lead to a win-win situation for biodiversity and climate if appropriately implemented. As current trends will likely take cumulative deforestation to 20 per cent of the Brazilian Amazon by, or near, 2020, a programme of significant forest restoration would be a prudent measure to build in a margin of safety.

(Source: Global Biodiversity Outlook 3, 2010)



Haiti's forest cover has decreased from 80 per cent five centuries ago to less than 3 per cent today. Deforestation can trigger soil degradation, decline in agricultural production and significant water deficit.


Large-scale forest dieback of lodgepole pine in Western Canada due to extensive pine beetle damage, attributed to warmer temperatures

T. George

Over-exploitation and the bushmeat crisis

Commercial hunting combined with unsustainable logging activities are major threats to wildlife in tropical forests, and to food security and local livelihoods. Hunting pressure is further decimating many endangered species, including primates. The “empty forest syndrome,” caused by the over-exploitation of mammals, birds, reptiles and amphibians in many tropical and sub-tropical countries, has become a threat to tropical forests, and to the livelihoods of indigenous and local communities:

- Up to 75 per cent of tropical tree species depend on seed dispersal by animals. Many tree species would be unable to reproduce without their seed dispersers.
- Food security for indigenous peoples and local communities is at risk. Up to 80 per cent of protein intake in rural households in Central Africa comes from wild meat.
- Habitat loss increases human-wildlife conflict and reduces the potential for sustainable wildlife management.



Many tropical plants rely on animals to disperse their seeds, such as this seedling of *Ilana* germinating from elephant dung.

Courtesy of Ian Redmond




E. Bennett, WCS

The CBD and its partners are addressing the “bushmeat crisis” through a series of recommended actions that parties should take at the national and regional level (CBD 2009), including better reflecting the importance of bushmeat for local and national economies, and the developing livelihood alternatives.

Invasive alien species

Invasive alien species (IAS) are species whose introduction and/or spread outside their natural habitats threaten biodiversity. While only a small percentage of organisms transported to new environments become invasive, their negative impacts on food security, plant, animal and human health and economic development can be extensive and substantial. The spread of invasive alien species is one of the major threats to biodiversity globally; the effects are particularly severe on islands and in fragmented ecosystems.

In forest ecosystems, invasive alien species are particularly common in secondary and disturbed forests. For example, one of the most notorious invasives, *Lantana camara*, also known as Spanish Flag or West Indian Lantana, is beginning to appear even in lightly disturbed natural forests in Africa, brought in by frugivorous birds. Lantana first takes hold in forest clearings and then in denser vegetation. It can form single-species thickets and impact a wide area and range of species because its leaves produce



Invasive alien species are one of the main threats to biodiversity globally. *Lantana camara*, also known as Spanish Flag or West Indian Lantana, is an invasive alien species that is replacing indigenous plants and degrading forest ecosystems in many tropical and sub-tropical areas. *Lantana camara* is on the IUCN list of the 100 worst invaders.

Junko Shimura

biochemicals that repress the growth of other plants, and the foliage provides dense shade.

Addressing the problem of invasive alien species is urgent and the economic and environmental impacts are severe. The problem continues to grow due to global trade, transport and travel, including tourism, at an enormous cost to human and animal health and the socio-economic and ecological well-being of the world. Dealing with biological invasions should be a basic aspect of good forest management. Early detection, identification and rapid management action to address invasive species before they become well established are the best lines of defence. Established invasions are extremely difficult to manage and regular monitoring of forests for new plants, animals and/or damage are essential.

Biodiversity loss is no longer solely an environmental issue. It is also an economic one. Postponing action to protect life on earth is not an option. The need to act is now.

—Ali Abdussalam Treki, President of the 64th Session
of the United Nations General Assembly, 2010



HOPE FOR FOREST BIODIVERSITY

A growing concern

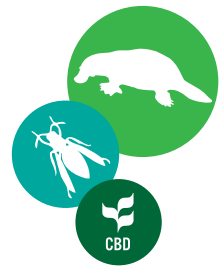
Forests have been on the international political agenda for many years. The 1992 United Nations Conference on Environment and Development (UNCED), held in Rio De Janeiro, Brazil, gave birth to the CBD, the Convention on Biological Diversity, with its three objectives: 1. the conservation of biological diversity; 2. the sustainable use of its components; and 3. the fair and equitable sharing of the benefits from the use of genetic resources.

Since the Rio Summit, considerable progress has been made regarding forest biodiversity, with several international meetings being held and numerous processes being created. Given the importance of forests, the CBD decided that an effective programme of work on forest biological diversity was needed to address the issues confronting forest systems. The Secretariat of the CBD assists Parties in implementing this programme of work.

CONVENTION ON BIOLOGICAL DIVERSITY'S PROGRAMME OF WORK ON FOREST BIODIVERSITY

The CBD's expanded programme of work on forest biodiversity, adopted in 2002, is a global action plan to safeguard biodiversity in forests. Parties may implement its 130 actions according to their national priorities. Activities range from establishing effective networks of protected areas, to improving the governance framework for sustainable forest management, to combating invasive alien species (www.cbd.int/forest).

Since 1992, efforts to save forest biodiversity have intensified. Based on their global commitments, the 193 Parties to the CBD have adopted and implemented landmark policies at the national level to conserve biodiversity,

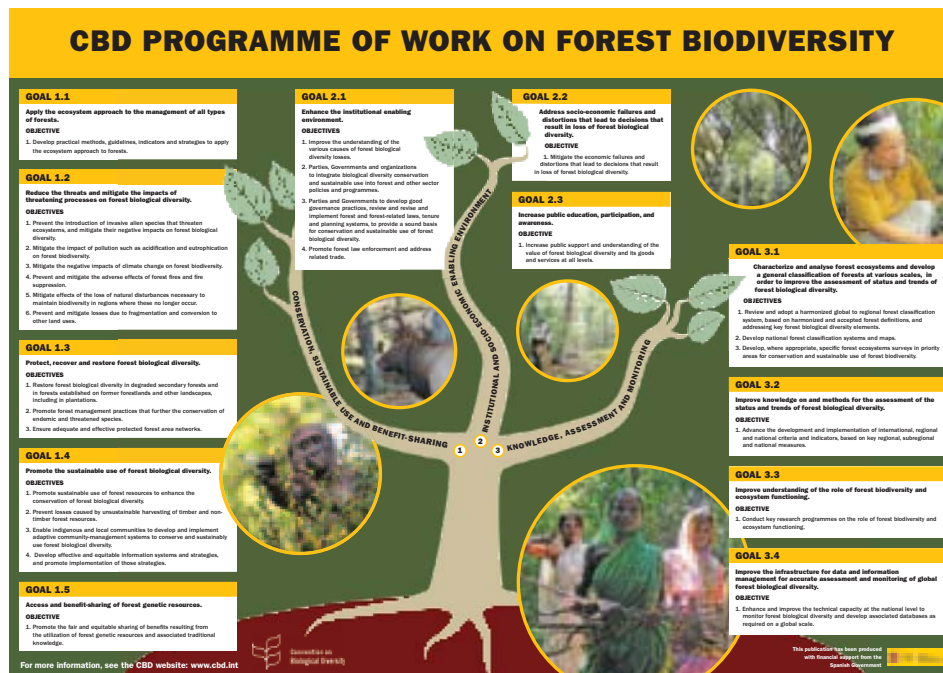


When we plant trees, we
plant the seeds of peace
and the seeds of hope.

— Wangari Maathai

including a drastic increase in the number of protected areas, which now cover around 12 per cent of all forests.

The third edition of the *Global Biodiversity Outlook (GBO-3)*, published in May 2010, concluded that biodiversity loss can be halted, and perhaps reversed, if concerted action is taken at local, national and international levels. It provides many success stories detailing how local communities and other key actors have managed to turn the tide. In October 2010, the CBD adopted a new Strategic Plan for the period 2011-2020, which includes targets to halve deforestation, to increase the coverage of protected areas to 17 per cent, and to ensure that all forests are managed sustainably by the year 2020. The new Strategic Plan also aims for the restoration of at least 15 per cent of degraded forest landscapes by 2020.



The CBD Programme of Work on Forest Biodiversity can be found online at www.cbd.int/forest



REDD-plus: a new way to save forests

Under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC), efforts are under way to establish a mechanism that would reward governments, local authorities and forest owners in developing countries for keeping their forests intact instead of cutting them down. This mechanism, called “*Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries*” (REDD-plus¹) is based on the idea that trees store carbon, as they absorb carbon dioxide, storing it into their roots, trunk, branches, leaves and the soil, and “breathe out” oxygen. Deforestation and degradation of forest ecosystems contribute to an estimated 15 per cent of annual greenhouse gas emissions from human activity entering the atmosphere, and therefore to climatic change and global warming. It has been estimated that the financial flows to developing countries from a successful REDD-plus mechanism, which would reduce these emissions by curbing deforestation and forest degradation, could reach up to US\$ 30 billion a year.

REDD-plus is first and foremost an instrument that aims to reduce greenhouse gases in the atmosphere and thereby mitigate global climate change. However, if well designed and successfully implemented, it will also provide unprecedented benefits for biodiversity. Establishing and effectively managing protected areas, for example, not only protects the trees and the carbon stored in them, but also all other forest species, including animals. Establishing a whole network of parks and ecological corridors, and restoring forest landscapes, will provide wildlife and other species with enough space to freely move and maintain healthy populations. The forests can continue to play an important role in purifying water and conserving soil, and provide a multitude of other ecosystem services.

¹ As negotiations under the United Nations Framework Convention on Climate Change are ongoing, the term “REDD-plus” is used without any attempt to pre-empt or pre-judge ongoing or future negotiations.

SUSTAINABLE FOREST MANAGEMENT

The United Nations has defined sustainable forest management (SFM) as “a dynamic and evolving concept that aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations”. The concept has inspired many efforts at the local, national and regional level to improve the management of forest resources.

In 2007, the UN General Assembly adopted the non-legally binding agreement on all types of forests, with the aim to improve the sustainable management of the world’s forests. SFM is the core of the “global objectives on forests” (see below), particularly as an avenue to “reverse the loss of forest cover worldwide”



and to “enhance forest-based economic, social and environmental benefits and people’s livelihoods.” SFM is also a key tool to address the relationship between forests and people for the well-being of both. To this end, a balance between conservation and sustainable use is needed, in line with the objectives of the CBD. The CBD Secretariat and IUCN have published a Good Practice Guide, *Sustainable Forest Management, Biodiversity and Livelihoods*, which includes case studies for successful implementation of the concept in different countries and regions (www.cbd.int/development/training/guides).

GLOBAL OBJECTIVES ON FORESTS BY 2015

In 2007, The United Nations General Assembly agreed on four Global Objectives on Forests, to be achieved by 2015:

- Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation;
- Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest-dependent people;
- Increase significantly the area of sustainably managed forests, including protected forests, and increase the proportion of forest products derived from sustainably managed forests;
- Reverse the decline in official development assistance for sustainable forest management and mobilize significantly increased new and additional financial resources from all sources for the implementation of sustainable forest management.



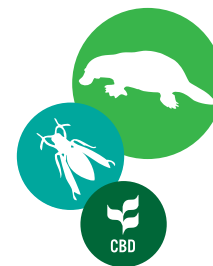
Publications on sustainable forest management and biodiversity

Sustainable Forest Management, Biodiversity and Livelihoods: A Good Practice Guide (www.cbd.int/development/training/guides/), produced by the CBD Secretariat and IUCN to support biodiversity conservation and poverty reduction in a number of different development sectors.

Sustainable Forest Management Policy Guidelines, developed by the International Tropical Timber Organization (ITTO), embrace aspects of SFM, such as planning, reduced impact logging, community forestry, fire management, and transboundary conservation. ITTO also developed guidance documents on criteria and indicators for SFM, restoration and planted forests, forest law enforcement and the sustainable use and conservation of mangrove ecosystems. In particular, the 'ITTO/IUCN guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests' provide valuable guidance for tropical forest managers (www.itto.int).

A Sustainable Forest Management Case Studies Database, compiled by FAO, contains case studies of country practices spanning more than 20 years (www.fao.org/forestry/39137/en/).

Sustainable Forest Finance Toolkit, jointly developed by PricewaterhouseCoopers (PwC) and the World Business Council for Sustainable Development (WBCSD) is one of the first private sector initiatives incorporating sustainable forest management criteria and consideration into the investment decision-making of the financial sector (www.pwc.co.uk/eng/issues/forest_finance_home.html).



In this International Year, we must counter the perception that people are disconnected from our natural environment. We must increase understanding of the implications of losing biodiversity... I call on every country and each citizen of our planet to engage in a global alliance to protect life on Earth... Biodiversity is life. Biodiversity is our life.

—Ban Ki-moon, United Nations Secretary-General

INTERNATIONAL YEAR OF BIODIVERSITY (2010) AND INTERNATIONAL YEAR OF FORESTS (2011)

The United Nations declared 2010 the International Year of Biodiversity, and 2011 the International Year of Forests, to renew global efforts for sustainable development and to continue the momentum for addressing two profoundly inter-linked and widely ranging issues. The International Year of Forests will provide many opportunities to celebrate the importance of forest biodiversity for people at local, national and global levels, such as an International Forest Film Festival. For more information see www.un.org/en/events/iyof2011/.



Inspiration, action, celebration

Many actions in support of biodiversity are having significant and measurable results in particular areas, species and ecosystems. With adequate resources and political will, the tools exist to save biodiversity. For example, recent government policies to curb deforestation have been followed by declining rates of forest loss in some tropical countries. Measures to control alien invasive species have helped a number of species to move to a lower extinction risk category. Success stories from around the world demonstrate how people are safeguarding biodiversity. Governments, local authorities, institutions, citizens and the private sector can all become involved in the effort to save forests and other ecosystems. Here are some examples.



Fernando Cavalcanti

The rate of deforestation in the Amazon Rainforest has decreased in recent years



Bornean clouded leopard (*neofelis diardi*) sitting between leafs and ferns, Kalimantan (Indonesian Borneo), Indonesia. The Bornean clouded leopard can also be found in Sumatra.

Alain Compost, courtesy of WWF-Canon

BRAZIL: BRINGING DEFORESTATION UNDER CONTROL

The most recent satellite data show that annual deforestation of the Brazilian portion of the Amazon Rainforest has slowed very significantly, from a peak of more than 2.7 million hectares in 2003–2004 to just over 700,000 hectares in 2008–2009, the lowest rate recorded in more than 20 years of monitoring. Preliminary indications based on monthly observations suggest that this declining trend has continued for 2009–2010. It means that Brazil will have reduced the deforestation of the Amazon Rainforest by more than the national target set in 2006: “decrease Amazon deforestation by 75 per cent by 2010” (Brazil’s Fourth National Report to the CBD).

KENYA FORESTRY SEED CENTRE: SAFEGUARDING THE GENETIC DIVERSITY OF FORESTS

The Kenya Forestry Seed Centre (KFSC) was established in 1985 to provide certified, high-quality tree seeds. Seeds are collected by a network of eight collection centres distributed in all ecological zones of Kenya. The seeds are obtained from selected and established tree stands of both exotic and indigenous species. The Centre collects over 4,000 kg of clean seeds annually from more than 120 different species. KFSC holds the national forestry genetic collection in the form of bulk seed to meet seed demand for tree planting programmes. Seeds are dispatched to various clients, including Kenya’s Forest Department, individual farmers, and local and international organizations involved in tree planting and environmental conservation (Kenya’s Fourth National Report to the CBD, 2009).

Among many new species recently discovered in Borneo rainforests are a lungless frog (*Barbourala kalimantanensis*), a long-tailed ninja slug (*Ibycus rachelae*), a flame-coloured snake (*Dendrelaphis kopsteini*), and an unexpected new species of skink (*Lipinia inexpectata*)



Peter Koomen, courtesy of WWF



David Bickford, courtesy of WWF



Christopher Austin, courtesy of WWF



Gernot Vogel, courtesy of WWF

LOCAL ACTION FOR FOREST BIODIVERSITY IN CAMBODIA

The Tmatboey village borders the Kulen Promtep Wildlife Sanctuary in northern Cambodia, an area known for its endangered bird populations, such as the white-shouldered ibis (*Pseudibis davisoni*). Given its proximity to the wildlife sanctuary, ecotourism is particularly important to the village. To promote sustainable use of the sanctuary, the Tmatboey Community Protected Area Committee has, amongst other things, established a comprehensive land use plan for the village and implemented a hunting ban. As a result of the Committee's actions, the decline of some critically endangered endemic wildlife species has stopped and has even been reversed, while deforestation and encroachment into key wildlife areas have not declined. As revenues from ecotourism are reinvested into local infrastructure, the actions of the committee have also helped to promote sustainable development in the village (Global Biodiversity Outlook, 2010).

HEART OF BORNEO FORESTS: THREE COUNTRIES JOIN EFFORTS FOR ONE CONSERVATION VISION

The dense tropical rainforests on the island of Borneo spread across the borders of Brunei, Indonesia and Malaysia. Over the past 15 years, more than three new species have been discovered every month in this great luxuriant biodiversity hotspot. To ensure that this treasure of life is not lost, the three Governments jointly declared their commitments to the protection of the Heart of Borneo. Their united efforts call for a coordinated transboundary management approach and collaboration with international partners, including WWF and the CBD Secretariat, to ensure environmental and economic sustainability (www.panda.org/heart_of_borneo).



Golden Valley
Costa Rica



Roberto-Faidutti



THE GREEN WAVE
One school, one tree, one gift to nature
UNEP CBD

THE GREEN WAVE: ONE SCHOOL, ONE TREE, ONE GIFT TO NATURE

The Green Wave is a multi-year campaign to raise awareness about biodiversity. Every International Day for Biological Diversity (22 May) since 2007, students around the world count down to 10:00 a.m. local time, when they plant a tree, or water the trees in their respective schoolyards, or take another action to support trees and forests. The sum of all the local actions creates a figurative “green wave” starting in the Far East and traveling west around the world.

The Green Wave transmits an important message from the young generation around the world: “We want a healthy, biodiverse future; we will unite and take action for biodiversity; we are working towards reducing biodiversity loss.” More information is available on the Green Wave website: http://greenwave.cbd.int/en/map_2008.

What each of us can do

Each of us shares a responsibility for our Earth’s living treasure. The International Year of Biodiversity team has published a guide with 52 actions which we all can take in the course of one year to promote the conservation and sustainable use of biodiversity¹.

These actions include reducing our ecological footprint by buying local food and other products; reusing and recycling the products of everyday life;

¹ Copies of this guide can be ordered via e-mail at secretariat@cbd.int. In addition, there are many websites that provide advice for a more sustainable consumption patterns, for example: www.wikihow.com/Help-Protect-Biodiversity. Specific resources for schools are available at <http://greenwave.cbd.int/en/home>



reducing our energy consumption; and becoming active in environmental organizations and our municipalities to improve the way we interact with and manage our natural environment. By learning more about the impacts of our actions on biodiversity, both positive and negative, we take greater responsibility for changing our behaviour as individuals and as societies. To get started, individuals, families or communities can follow a few simple steps to ensure that our actions contribute to the conservation and sustainable use of forest biodiversity:

1. Learn. Learn about the species, forests and other ecosystems in your surroundings, and learn about the connections between the health and vitality of your natural environment, and your own. There are many different sources of information, for example, ask your local municipality, local government, or national government about the importance of biodiversity and forests, and how you can improve the conservation and sustainable use of forests in your neighbourhood.

2. Be aware. Our consumption patterns can drive deforestation. Avoid “carbon intensive” food (products requiring a lot of resources and energy for their production and/or transport) such as beef, and products that often have a direct negative impact on forest biodiversity, such as palm oil. Learn about the linkages between the food and other products you buy, and your eco-



logical footprint (for example, information is available at the Global Footprint Network, www.footprintnetwork.org). Buy locally grown food, whenever possible. Never use, eat or buy endangered species, and be aware of the need to conserve them. When shopping for wood, timber or paper products, buy products only from certified sources. There are several credible labels for the certification of responsible forest management, for example the Forest Stewardship Council—FSC (www.fsc.org).

3. Act. Once you have a better understanding of local biodiversity issues, it is time to take action. One fun activity and at the same time a very useful one is planting a tree. Planting a local tree species, in an area where it would naturally occur, can serve as a good opportunity to raise awareness amongst your family, friends, and your community about the multiple values of trees and forests. A very important action to save biodiversity is to reduce our consumption of energy and resources. Deforestation is largely driven by the need to produce agricultural commodities. Be aware of the origin and supply chain of the food and products you buy, and limit the use of carbon intensive products. Use, reuse or repair things and recycle once they are worn out; save energy by reducing your electricity consumption.

5. Share. Share your experiences with your family, friends and community members. Encourage them to work with you in helping protect biodiversity. This could be as part of a school project, with your class, neighbourhood, community, club or local group. Consider supporting and joining local non-governmental organizations that work on biodiversity issues. Talk with your local government officials, local farmers and community members about biodiversity. Find out about local priorities for biodiversity and how you can help. Ask your national government and your local and regional authorities what they are doing to protect forest biodiversity.



FURTHER INFORMATION

Websites of the international organizations in the Collaborative Partnership on Forests (CPF):

Center for International Forestry Research (CIFOR): www.cifor.cgiar.org

Food and Agriculture Organization of the United Nations (FAO): www.fao.org

International Tropical Timber Organization (ITTO): www.itto.int

International Union of Forest Research Organizations (IUFRO): www.iufro.org

IUCN—International Union for Conservation of Nature: www.iucn.org

Secretariat of the Convention on Biological Diversity (CBD): www.cbd.int

Secretariat of the Global Environmental Facility (GEF): www.thegef.org

Secretariat of the United Nations Convention to Combat Desertification (UNCCD): www.unccd.int

Secretariat of the United Nations Forum on Forests (UNFFS):
www.un.org/esa/forests

Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC): www.unfccc.int

United Nations Development Programme (UNDP): www.undp.org

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The Economics of Ecosystems and Biodiversity (TEEB): www.teebweb.org

The Green Wave: <http://greenwave.cbd.int>

The Nature Conservancy: www.nature.org

UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD): www.un-redd.org

UNEP Climate Change Science Compendium: www.unep.org/compendium2009

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