

## Biodiversity: Latin America and the Caribbean

The region contains a wide variety of ecosystem types. Tropical moist and dry broadleaf forests cover 43 per cent of the territory; grasslands and savannas 40.5 per cent; deserts and scrub 11 per cent; temperate forests and tropical and sub-tropical coniferous forests 5 per cent; and mangroves the remaining 0.5 per cent (Dinerstein and others 1995). The region's rivers and lake ecosystems and the marine ecosystems of the Pacific and Atlantic coasts are also productive habitats with high diversity of species. The Caribbean contains 7 per cent of the world's coral reefs (about 20 000 km<sup>2</sup>) with a great array of marine biodiversity (UNEP 2001).

Seven of the world's 25 biologically richest terrestrial ecoregions are found in the region, containing between them more than 46 000 vascular plant, 1 597 amphibian, 1 208 reptile, 1 267 bird and 575 mammal species (Mittermeier, Myers and Mittermeier 1999, Myers and others 2000).

### Habitat loss and degradation

As a result of habitat conversion and loss, 31 of the 178 ecoregions in the region are in a critical state of conservation, 51 are endangered and 55 are vulnerable (Dinerstein and others 1995). Most endangered ecoregions are found in the northern and central Andes, Central America, the steppe and winter rainfall areas of the southern cone, the Cerrado and other dry forests south of the Amazon basin, and the Caribbean (Dinerstein and others 1995). Myers and others (2000) located 7 of the world's 25 hot spots (where exceptional concentrations of endemic species are undergoing exceptional loss of habitat) in the region.

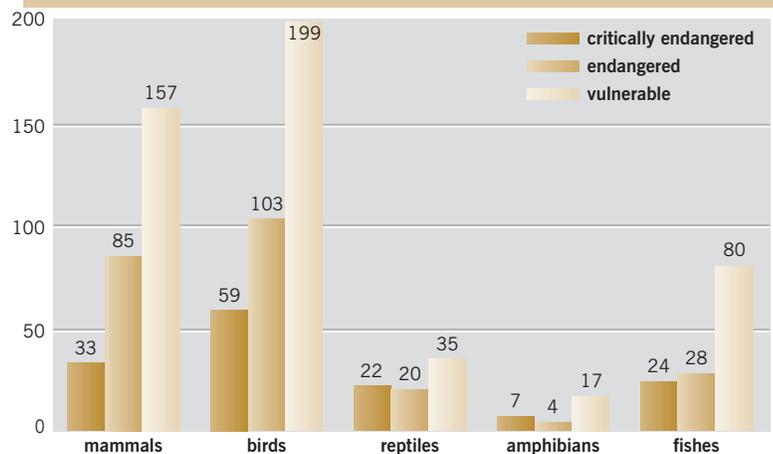
The Neotropics possess 6 of the 12 countries in the world where globally threatened bird species are concentrated, with Brazil and Colombia having the highest numbers in this category (BirdLife International 2000). Together, Brazil, Colombia, Peru and Mexico account for more than 75 per cent of threatened bird species in the Americas (BirdLife International 2000).

Cloud forests and other humid montane forests have been identified as one of the most threatened habitat types in the region. They are found where persistent cloud cover is in contact with the mountainside, at altitudes of 1 000–3 000 metres and play a critical role in

the provision of clean water supplies to human populations in the lowlands. Humid montane forests also harbour the wild relatives and gene pools of many New World crops, including potatoes, maize and beans (Debouck and Libros Ferla 1995).

The principal pressures on cloud forests are clearance for subsistence and commercial agriculture by rural communities, and in some regions for plantations of narcotics. Human population growth and poverty drive these processes but the construction of roads and increased links to commercial markets has also stimulated the production of cash crops. Other major pressures include deforestation for cattle

### Numbers of threatened vertebrates: Latin America and the Caribbean



Note: critically endangered (extremely high risk of extinction in immediate future); endangered (very high risk of extinction in near future); vulnerable (high risk of extinction in medium-term future)

The data include all globally threatened vertebrate species with country records in the UNEP-WCMC database (UNEP-WCMC 2001a). Marine species recorded by ocean area are not included

ranching, which in the past has often been supported by government policies.

Lowland tropical rainforests have been the focus of particular conservation concern, being the habitat with the highest species richness and with continuing conversion of major areas to other land uses. The Brazilian Amazon is the largest tropical rainforest in the world, which once had a forested area of 4 million km<sup>2</sup>. By 1998, 86.3 per cent of this area remained, with 377 200 km<sup>2</sup> cleared during the preceding 20 years (Fearnside 1999). The mean rate of forest clearing accelerated in the 1990s, and the total area affected by fragmentation, clearing and edge effects is now estimated to comprise one-third of the Brazilian Amazon (Laurance 1998).

Deforestation in the Brazilian Amazon is driven by several processes. A major pressure is the ten-fold population growth in the region since 1960 (Goodman and Hall 1990). In addition, industrial logging and

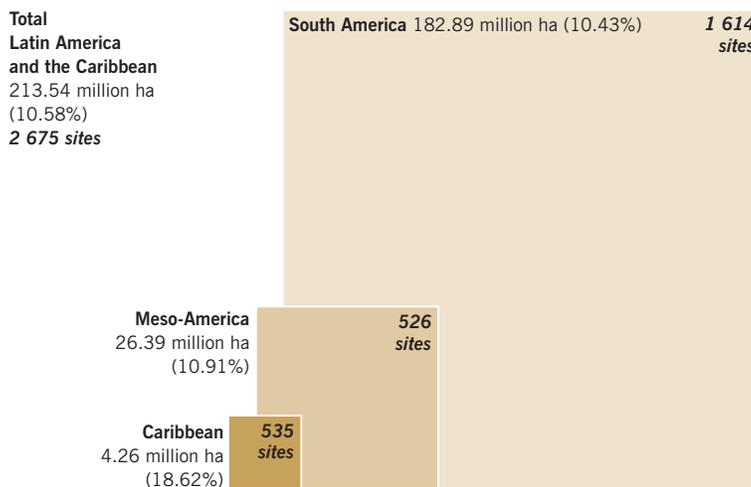
mining and their associated networks of roads, which make accessible new areas of forest to colonizers and ranchers, have been major factors in deforestation. Some 6 per cent of the region falls within the strictly protected category. Major efforts have been made in the field of timber certification and forest preservation to reverse the loss of biodiversity (UNEP-ECLAC 2001). Human-ignited fires have also become widespread, especially in logged and fragmented areas (Laurance 1998).

A new approach to promoting montane forest conservation in the region is to compensate forest owners for the environmental services their forests provide to society, often financed by the collection of a small surcharge on the users of water originating in the forests. Such schemes are being considered in several Latin American countries and have been tested in Costa Rica (Campos and Calvo 2000). Many forest conservation initiatives have been developed in the Amazon, including land-use planning, the establishment of protected areas linked by corridors and extractive and Amerindian reserves. The largest of these is the Pilot Programme to Conserve the Brazilian Rainforest, with support from the G-7 nations. However, further major infrastructure, industrial agriculture, mining and logging projects are currently planned for the Amazon (Laurance and others 2001).

The CBD has played an important role in terms of the response to biodiversity loss. While some countries have incorporated the CBD's objectives in general legislation, others have done so by means of sectoral laws. The former group includes Brazil, Colombia, Costa Rica, Peru and Venezuela. For example, Brazil established a National Programme on Biological Diversity in 1994 together with an accompanying project for the conservation and sustainable use of Brazilian biological diversity (PROBIO), identifying priority conservation areas and actions through a series of assessments. In Peru, the Law for the Conservation and Sustainable Use of Biological Diversity, which covers most CBD commitments, entered into force in 1997. It is expected that the nine Caribbean countries now preparing national strategies on biodiversity will implement the CBD by means of legislation, development of institutional mechanisms and by providing adequate resources (UNEP 2000). Countries that are modifying their sectoral laws include Cuba, Honduras, Mexico, Nicaragua and Panama. However, legislation for the implementation of the CBD has often been developed without reference to other biodiversity-related conventions such as CITES, the Convention on Migratory Species and Ramsar.

National funding programmes such as the Mexican Fund for Nature Conservation have been established as part of national efforts to implement the CBD. Additional sources of funding include organizations such as the World Bank and the Inter-American Development Bank, together with other international agencies, NGOs and bilateral cooperation agencies.

### Protected areas: Latin America and the Caribbean



Note: number of protected areas includes those in IUCN categories I-VI

Source: compiled from UNEP-WCMC 2001b

The forests of eastern coastal Brazil are considered among the most endangered habitats on earth and have been given highest priority for biodiversity conservation (Bibby and others 1992). They contain 7 000 endemic plants and 779 endemic vertebrates — 2.7 and 2.1 per cent of the global total, respectively (Myers and others 2000). In the Bahia region, only 0.4 per cent of continuous forest cover remains of the original forest area of 215 436 km<sup>2</sup> (Mendonça and others 1994). Threats arise from coastal development and uncontrolled logging, agriculture and charcoal production.

Overall, more than 10 per cent of the region is currently protected (see graphic). In addition, the attractiveness of the cloud forests and recognition of their values by concerned individuals has led to the creation of many private forest reserves in the region, often linked to scientific research programmes and ecotourism ventures. A related trend in the 1990s has been the creation of community-managed montane forest reserves.

Between 1988 and 1999, the World Bank Group approved 74 biodiversity projects in the region which were declared consistent with the goals and objectives of the CBD. A substantial amount (more than US\$700 million) has been distributed among regional efforts to conserve biodiversity, especially since 1995. As expected, most of the resources went to the largest countries. Brazil alone received 56 per cent of the total but this benefit has not been equally distributed among ecosystems, the majority going to the Amazon and Atlantic rainforests.

### Unsustainable harvesting and illegal trade

Illegal trade in plants and animals is one of the greatest threats to biodiversity in many countries including Brazil, Colombia, Mexico and Peru. It is difficult to measure the extent of this illegal trade and its impact on lesser-known species. Estimates suggest that Brazil accounts for 10 per cent of the global wildlife trade, which is valued at approximately

US\$10 000 million per year. Despite ongoing efforts, including development and implementation of national strategies to control illegal trafficking in countries such as Colombia, police records on seizures confirm that illegal trade of flora and fauna remains a widespread problem (Government of Colombia 2000, RENTAS 2000).

National governments are responding to this issue in a number of ways. For example in Colombia, the sale of some wild animals (both live and as animal products) is permitted for domestic and international markets. There are 50 private establishments with legal authorization to capture caiman (*Caiman crocodiles*), iguana (*Iguana iguana*), boa (*Boa constrictor*), black tegu (*Tupinambis nigropunctatus*) and capybara (*Hydrochaeris hydrochaeris*) for processing and marketing. As a result, in the year 2000, 739 000 caimans, 232 000 iguanas, 3 530 boas, 2 700 black tegu and 10 000 capybaras were captured for market in accordance with national regulations and the recommendations of CITES.

### References: Chapter 2, biodiversity, Latin America and the Caribbean

- Bibby, C. J., Collar, N. J., Crosby, M. J., Heath, M. F., Imboden, C., Johnson, T. H., Long, A. J., Stattersfield, A. J. and Thirgood, S. J. (1992). *Putting Biodiversity on the Map: Priority Areas for Global Conservation*. Cambridge, International Council for Bird Preservation
- BirdLife International (2000). *Threatened Birds of the World*. Barcelona and Cambridge, Lynx Edicions and BirdLife International
- Campos, J.J. and Calvo, J.C. (2000). Compensation for environmental services from mountain forests. In M. Agenda (ed.), *Mountains of the World: Mountain Forests and Sustainable Development*. Berne, Mountain Forum
- Debouck, D.G and Libros Ferla, D. (1995). Neotropical montane forests: a fragile home of genetic resources of wild relatives of New World crops. In S.P. Churchill and others (eds.), *Biodiversity and Conservation of Neotropical Montane Forests*. New York, New York Botanical Garden
- Dinerstein, E., Olson, D., Graham, D., Webster, A., Primm, S., Bookbinder, M. and Ledec, G. (1995). *A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean*. Washington DC, World Bank
- Fearnside, P. M. (1999). Biodiversity as an environmental service in Brazil's Amazonian forests: risks, value and conservation. *Environmental Conservation*. 26, 4, 305–21
- Goodman, G. and Hall, A. (1990). *The Future of Amazonia: Destruction or Sustainable Development?* London, Macmillan
- Government of Colombia (2000). *El Comercio Ilegal de Especies*. Ministerio del Medio Ambiente de Colombia  
<http://www.minambiente.gov.co/biogeomenu/biodiversidad/especies/comercioilegal.htm> [Geo-2-092]
- Laurance, W.F. (1998). A crisis in the making: responses of Amazonian forests to land use and climate change. *Trends in Ecology and Evolution*. 13, 411–15
- Laurance, W.F., Cochrane, M.A., Bergen, S., Fearnside, P.M., Delamonica, P., Barber, C., D'Angelo, S. and Fernandes, T. (2001). Environment - The future of the Brazilian Amazon. *Science*. 291, 438–39
- Mendonça, J. R., de Carvalho, A. M., Mattos Silva, L. A. and Thomas, W. W. (1994). *45 Anos de Desmatamento no Sul da Bahia, Remanescentes da Mata Atlântica - 1945, 1960, 1974, 1990*. Ilhéus, Bahia, Projeto Mata Atlântica Nordeste, CEPEC
- Mittermeier, R.A., Myers, N. and Mittermeier, C.G. (1999). *Hotspots. Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions*. Mexico City, CEMEX and Conservation International
- Myers, N., Mittermeier, R.A., Mittermeier, C.G., Da Fonseca, G.A.B. and Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*. 403, 853–58
- RENTAS (2000). *Data about the Traffic: Traffic Numbers*. Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA (Brazilian Institute for Environment and Renewable Natural Resources)  
<http://www.rentas.org.br/index.html> [Geo-2-095]
- UNEP (2000). *GEO Latin America and the Caribbean Environment Outlook*. Mexico City, UNEP Regional Office for Latin America and the Caribbean
- UNEP (2001). *World Atlas of Coral Reefs*. Nairobi, United Nations Environment Programme
- UNEP-ECLAC (2001). *The Sustainability of Development in Latin America and the Caribbean: challenges and opportunities*. Santiago, UNEP-ECLAC
- UNEP-WCMC (2001a). *GEO3 Endangered Animals Snapshot*. United Nations Environment Programme-World Conservation Monitoring Centre  
<http://valhalla.unep-wcmc.org/isdb/geo3.cfm>, 10 October 2001 [Geo-2-094]
- UNEP-WCMC (2001b). *GEO3 Protected Areas Snapshot*. United Nations Environment Programme-World Conservation Monitoring Centre  
<http://valhalla.unep-wcmc.org/wdbpa/GEO3.cfm> [Geo-2-096]