

Pollinators, Protected Areas, and Migratory Birds are developed.
 — Number of datasets consistent with IABIN interoperability standard increased by 20% per year.
 — At least 100 people trained per year in providing biodiversity informatics data.
 — Develop 5 applications to mainstream the use of biodiversity information in decisions affecting production landscapes.
 — Visits to IABIN Portal increases by at least 25 % per year from a base of 15,000 hits per month in late 2003.
 — Increase of 20 institutions per year formally allied to IABIN.
 — By year 5, fund-raising reaches 100% of IABIN recurrent costs covered by the GEF Project.

BOX 4.
BIODIVERSITY INFORMATICS IMPROVES DECISION-MAKING FOR ENVIRONMENTAL MANAGEMENT

ARGENTINA Resolving conflicts between human and ecological needs in the Parana, Uruguay, and Paraguay River floodplains was critical to the success of the Argentina Flood Protection Project. Floodplain biodiversity has been threatened by agricultural expansion, interference with flood processes and natural wetlands, and illegal hunting and felling of gallery forests. Based on the findings of a regional environmental assessment, the project adopted a "living with floods strategy," which enhanced the local community's capacity to deal with periodic flooding, while conserving the natural ecological processes essential for maintaining biodiversity.

COSTA RICA The Biodiversity Information System called Atta has been developed by the National Institute of Biodiversity (INBio) of Costa Rica. Atta records, administers, and disseminates biodiversity data. Successfully integrated to a distributed database access scheme, Atta gives access to more than 4.5 million specimen records in Mexico and Costa Rica. It links the strictly biological information with other types of information such as GIS (SIG) geographic coverage (www.inbio.ac.cr/atta).

MEXICO Incorporating information from 146 countries, the World Biodiversity Information Network (REMIB) is a computerized system of biological information. REMIB includes databases of a curatorial, taxonomic, ecological, cartographic, bibliographic, and ethno- biological type. It also includes use of catalogues on natural resources and other subject matters (http://www.conabio.gob.mx/remib_ingles/doctos/remib_ing.html).

HEMISPHERE WIDE Causing over \$200 billion US in economic damage in the Americas Hemisphere, invasive species pose increasing risks to human health, native species, ecosystems, and national economies. The IABIN Invasive Species Thematic Network (I3N) encourages the standardization of databases, promotes their interoperability, and creates value-added products. I3N was initiated by the United States Geological Survey in 2001 in fourteen countries in the Hemisphere (http://www.iabin-us.org/projects/i3n/i3n_project.html).

BOX 5.
THE CONVENTION ON BIOLOGICAL DIVERSITY AND INFORMATICS

The Clearing House Mechanism under the Convention of Biological Diversity, the Global Biodiversity Information Facility (GBIF), and the Inter-American Biodiversity Information Network (IABIN) (www.IABIN.net) present increased opportunities to create interactive biodiversity informatics systems that are conducive to fostering technical and scientific cooperation. IABIN works hand-in-hand with the CHM (Clearing-House Mechanism) of the Convention on Biological Diversity (CBD) (www.biodiv.org). The activities proposed for the implementation of IABIN will help fulfill, at the regional level, CHM's goals of exchange of biodiversity information and exchange of scientific and technical expertise. IABIN Focal Points are commonly the CHM Focal Points for their respective countries. The Convention has established CHM to:

- Promote and facilitate technical and scientific cooperation, within and between countries
- Develop a global mechanism for exchanging and integrating information on biodiversity
- Build the necessary human and technological network.

IABIN's success will be measured through the incidence of increased sound environmental management. This includes changes in usage patterns of biodiversity in the countries in the Americas, decisions for biodiversity management (e.g. invasive species, pollinators, and protected areas) and drawing on project-gathered information to take advantage of improved interoperability between specimens, species, and ecosystem networks, resulting in novel combinations of datasets.

For further information please contact Richard Huber (rhuber@oas.org 202-458-3227) of the General Secretariat OAS Unit for Sustainable Development and Environment (USDE). This paper benefited from inputs from the IABIN Executive Committee and other biodiversity informatics specialists. This USDE Policy Brief series provides a forum for discussion on issues pertaining to sustainable development to help transfer good practices and lessons learned from project design and implementation. This Biodiversity Policy Brief is the first in a series. Forthcoming will be topics under the titles:

- Integrated water resource management in the Americas
- Managing Groundwater Aquifers in the Americas
- Natural Hazard Mitigation
- Economic Integration and Environment Issues:
- Lessons from Trade-Environment assessments and capacity building
- Financing Renewable Energy in the Hemisphere
- Climate Vulnerability in Small-Island States



Biodiversity Conservation and Management

WHY DOES IT MATTER?

The Americas Hemisphere harbors a wealth of biodiversity from the Bering Sea to the Meso-American coral reef — from the flooded forests of the Amazon River to the expanse of Patagonia. Of the World's 192 independent states, those lying within the tropics contain the lion's share of the world's species. Referred to collectively as "megabiodiversity countries," the Americas play a leading role in protecting species and their habitats. Of the top ten megabiodiversity countries — India, Brazil, Colombia, Ecuador, Peru, Mexico, Madagascar, Zaire, Australia, and China — half are found in Latin America. Together these ten countries contain as much as 50 to 60 percent of the world's species. For example, Ecuador's tropical forests contain over 15,000 plant species. (By contrast, there are 13,000 plant species in all of Europe¹). Indigenous peoples of the Amazon use over 1,300 plant species as medicines.² The richest and most diverse region on Earth, the Tropical Andes spans from western Venezuela to northern Chile and Argentina. Together, the area houses nearly 20 percent of the world's plant life concentrated in less than 1 percent of its area. Problems that include a lack of good biological and sociological data and an inability to access the data that does exist make adequate preservation and sustainable use of these natural assets a challenge.

WHY IS BIODIVERSITY IMPORTANT TO THE HEMISPHERE?

Biodiversity loss has severe consequences for humankind, since it erodes the capability of the Earth's ecosystems to provide the goods and services that generate economic, agricultural, public health, scientific, cultural, and spiritual benefits. Examples of ecosystem services include: nutrient recycling, water and air filtration services, pollution assimilation, gene banks, aesthetic services, recreational services, and wildlife habitats. Although attaching a monetary value to biological diversity is complicated and methodologically contentious, there is no doubt that the economic value of biodiversity is enormous. For example, a group of economists have estimated the economic value of the

services provided by the entire suite of the biosphere's natural ecosystems at 33 trillion dollars, equivalent to 1.8 times the entire world's GNP.³

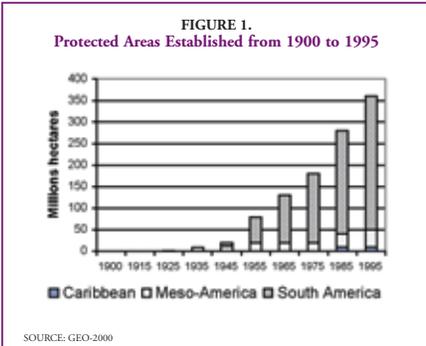
WHAT PROGRESS HAS BEEN MADE TO DATE?

Throughout Central and South America, deforestation occurs because of migration, lack of cultivatable lands, drought, and civil disturbances, as well as shrinking opportunities for small-scale farmers to produce cash crops. One bright spot in biodiversity



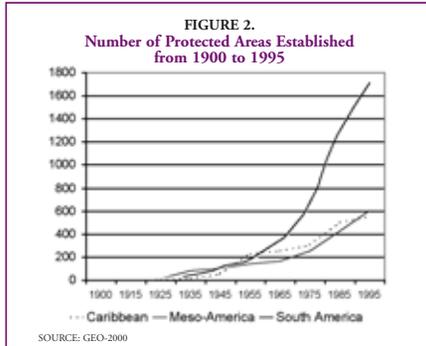
1 Myers, Norman. 1992. The Primary Source. WW Norton.
 2 Schultes, R. E. & R. F. Raffauf. 1990. The Healing Forest. Dioscorides Press.
 3 Costanza, R., et al. The value of the world's ecosystem services and natural capital. Nature, 387 (6630): 253-260 (May 15, 1997)

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conservation is the increase in national parks and protected areas. The total area in national parks and protected areas has increased at an impressive rate (See Figures 1 and 2).

Integrated ecosystem management is now considered a corner-stone of biodiversity protection. It is based on the diversity of traditional agricultural landscapes and related species richness. While nature conservation focuses on the most vital areas, where rare and endangered species are located, the large remaining areas — dominated by agriculture and forestry — are exposed to increasing land degradation that devalue their long-term economic productivity. Destroyed forests and degraded water resources imperil biodiversity, induce climate change, and disturb hydrologic cycles.



Integrated ecosystem management focused on larger landscapes permits species migration through ecological corridors. Ecological corridors are interconnected ecosystems that maintain flyways and byways for species movement and survival (see Boxes 1 & 2). One forthcoming corridor project, the Yungas Andinas Biological Corridor, will, once completed, extend from Southern Bolivia to the Northern Tucuman Province in Argentina. Perhaps the most ambitious corridor project is EcoAmericas, which includes plans to consolidate the core areas and buffer zones of the 36 World Heritage Sites and Biosphere Reserves located in the fifteen countries from Mexico to Argentina.⁴ The biological corridor conceived in the 1980's by the *Caribbean Conservation Corporation* and the *Wildlife Conservation Society (WCS)* seeks to reestablish a natural corridor through the range of the Florida Panther (South, Central, and North America). This project is known as the Paseo Pantera (Path of the Panther).

In addition to the above mentioned successful conservation initiatives, progress has been made in comprehensive policy reform aimed at alleviating the underlying causes of habitat conversion (see Box 3).

WHAT ARE THE OBSTACLES TO PROGRESS?

Many environmental issues are international in character, and addressing them requires the development of regional and global perspectives. Species migrate across geopolitical borders. Watersheds and ecosystems cut across national borders. International travel and transportation facilitate the introduction of species in geographic areas far beyond their native habitats, often with a negative impact. Actions taken in one country affect its neighbors' efforts to conserve biodiversity. To meet these challenges, the countries of the Americas have been working together to develop integrated approaches to biodiversity conservation and sustainable use.

WHAT ARE SOME SPECIFIC REMEDIES?

Although a layer of technological complexity and cost has been added to the international information regime, with the ascendancy of the World Wide Web, information can be cheaply and efficiently transferred. Easily accessible information may be considered the most cost-effective, market-based incentive to mainstream biodiversity concerns into policy and decision-making. Investments that lead to improved biodiversity information on the internet are cost-effective, empower improved decision-making at the local level, and promote ownership. Making high-quality baseline and observed data freely available promotes improved decision-making (provided issues such as repatriation of data and intellectual property rights are resolved) (see Box 4).

SOURCE: www.gefweb.org

BOX 2.
DOMINICA, ST. VINCENT, AND ST. LUCIA —
Preserving Biodiversity and Endemic Parrots at the Ecosystem Level

DOMINICA. Over 8,000 acres of oceanic rain forest on the slopes of the region's tallest volcano, Morne Diablotin, have been protected within Dominica's Morne Diablotin National Park that harbors Dominica's Sisserou and Jaco parrots. The Sisserou, Dominica's national bird, is the rarest of all Amazon parrots, and the flagship species for the eastern Caribbean's largest, intact oceanic rain forest ecosystem.

ST. VINCENT. The St. Vincent Amazon parrot is considered the island's national symbol representing the island's imperiled forest ecosystems. In 1976, the population was estimated to number 500-550 individuals. A volcanic eruption in 1979 and hurricane Allen in 1980 destroyed important nest sites and foraging grounds, placing this already threatened species further in jeopardy. The population declined to around 400 birds, but recently there have been signs of recovery. It is estimated that 500+ birds remain in the wild (www.rare-species.org/flcarib.htm).

St. Lucia. In 1975, as few as 100 St. Lucia parrots (jacquot) survived in the wild. The St. Lucia Forestry and Lands Department initiated an island-wide education program while protecting substantial areas of rainforest and banning all hunting until further notice. The jacquot became the National Bird in 1979, the year of St. Lucia's independence. The number of St. Lucia parrots in the wild has almost tripled since conservation measures were first introduced (www.thewildones.org/Animals/stLParrot.html).

SOURCE: www.gefweb.org

Information networks and distributed databases that have multi-governmental affiliations and utilize national in-country focal points, or nodes, to disseminate information provide the building blocks for improved decision-making through better access to biodiversity databases and value added information (see Box 5).

IABIN is developing an Internet-based platform, improving interoperability among existing and future biodiversity-relevant databases, integrating network-accessible biodiversity content, and implementing a communications and partnership strategy. The World Bank and Organization of American States (OAS) work with the 34 IABIN focal points (one per Member State) to mainstream biodiversity concerns into the decision-making process by promoting information sharing that leads to improved natural resources management. Other partners are the museums, universities, and institutions that house biodiversity data and seek better tools for creating open and transparent methods to share data that improves decision-making. IABIN is a self-sustaining program that helps create incentives for local community engagement in conservation by providing improved information access. Local communities

that engage in conservation for incentive-oriented ventures access the vast information network and post relevant information.

MEASURABLE OUTCOMES

IABIN encourages partnerships among institutions that access either distributed or centralized digital databases such as REMIB – Mexico, INBio – Costa Rica, Humboldt Institute – Colombia, CRIA-Brazil, NBII – United States and the major botanical and faunal collections such as the ones at the Smithsonian Institution and the New York and Missouri Botanic Gardens. IABIN provides biodiversity information to users through an information catalogue called BioBot, developed jointly with the United States Geological Survey.

IABIN is applying for \$6 million US grant from the Global Environment Facility. The following time-bound performance indicators will measure progress stimulated by that Grant: — IABIN BioBot Metadata Catalogue Service is functional with an expanding user base and number of data providers increasing by 20% per year. — Thematic Networks in Species, Specimens, Ecosystems, Invasives,

BOX 3.
COSTA RICA – LEADERSHIP IN CONSERVATION

Incentives for conservation. Costa Rica is one of the few countries in Latin America to promote reforestation through incentives such as tax credits, direct payments, and subsidized loans that have benefited landowners large and small. Among the important steps Costa Rica has taken are the following:

- The "polluters pay" principle, introduced through the establishment of a tax on fossil fuels to pay for environmental services.
- The "user pay" principle, which calls for charging a visitor entrance fee to enter national parks.
- The Costa Rican Office of Joint Implementation was established to trade carbon emissions in the international market.
- The government instituted a national system to certify good forest management and ecotourism practices.
- The Government delegated responsibility for forest management and conservation to private landowners increasing land and water rights.
- The protected areas system has grown from only two PA's of about 2,500 hectares in 1950 to more than 120 parks today covering 1.2 million hectares, or about 25% of the total land area.
- By 1998, tourist revenues had grown to \$1 billion and tourism (much of which is forest based) is now the country's primary source of foreign exchange.

SOURCE: Instituto Nacional de Biodiversidad (www.inbio.ac.cr). Ministerio del Ambiente y Energía (www.minae.go.cr).