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TROPICAL FOREST CONSERVATION



THE ART OF THE IMPOSSIBLE



Special report — pages 13-40



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Brief respite from the conference table for IUCN's Council during their November meeting in Gland.

Council Insists

Programme, finance and membership matters topped the agenda of the 19th session of IUCN Council held in Gland, Switzerland, last 14-15 November. The Union's elected steering body made sure that environmental problems in the Sahel and other global issues were given their rightful share of debate and Council applauded swift progress in core and field programme activities made over the past year.

But many Councillors saw a risk that the reach of the current Union Programme — now nearing its mid-point — might exceed its grasp. A programmed approach should make possible a careful harnessing of action to means no less than vice versa, they insisted.

FINANCE: new broom

The Finance and Administration Committee set up last year under Union Treasurer Leonard Hentsch, met shortly before last November's Council meeting and again this 1-3 March, in Gland, Switzerland. Its main business in November was to brief Council on work now in progress to restructure the Secretariat's financial management, accounting and project management systems. The work is based on studies by specialist consultants Arthur Andersen and Company. The Committee also reported on steps to initiate a fundraising component within the Secretariat and to prepare a fundraising strategy which builds on the earlier version approved at the Madrid General Assembly.

OTTAWA: in sight

Council heard reports and endorsed action on preparations for the major world conference on the *World Conservation Strategy* scheduled for Ottawa, Canada, 30 May to 5 June 1986. Sponsors of the event include the Government of Canada, the Canadian Wildlife Federation, Canadian International Development Agency, Unesco, UNEP and WWF. Council was pleased with the strong support coming from the Union's Canadian network.

Council heard from David Munro, who has been designated Secretary-General of the Conference, and from Peter Jacobs, chairman of IUCN's Commission on Environmental Planning, who is responsible for the Conference programme. CEP Executive Officer Taghi Farvar is the Secretariat worker mainly responsible for planning and guiding the technical inputs to the Conference.

Munro reported that about 350 participants are expected, with 100 observers. He estimated that about 30% of the participants would come from developing regions.

REGIONS: growing scope

Councillors met consultant CAMERON SANDERS, who has been active in establishing an IUCN Regional Office in North America, and GERARD SOURNIA, the Union's regional representative in West Africa, based in Dakar. They heard that the Nairobi Office for East Africa is thriving after some administrative reshuffles and a Harare Office for Southern Africa is now operational.

MEMBERS: programme dynamo

The Madrid General Assembly set the stage for more careful forward planning of IUCN's work, with members becoming more and more involved in the design and implementation of programme activities. The Secretariat's role, said the Director General in his report to Council, is to concentrate on preparing strategic plans for conservation action in fields of urgent concern and to spark off action by members and other partners in allied fields, within a unified framework.

The Programme Advisory Committee, set up by Council last year to examine proposals prepared by the Secretariat and based on wide consultation with commissions, centres and membership, also briefed the November meeting. Programme frameworks for top priority work in such specific areas as Antarctica, Sahel, Wetlands and Tropical Forests were endorsed by Council, giving the green light to the Secretariat to now design and implement specific activities involving many different sectors of the conservation community.

In the PAC report, chairman Peter Jacobs expressed worries that this programming approach, though admirable, might outrun resources. The Committee had looked at four programmes out of five, along with Antarctica, population, the Sahel, the six Commissions and the Secretariat's three special Centres. To ease the burden, it was recommended that Task Forces should stand down when the initial assignment was completed, or be integrated in the regular Secretariat structure if circumstances permitted.

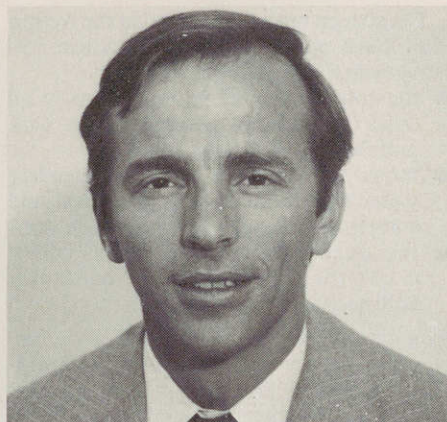
PAC met again in March 1986 to review the results of its recommendations and study subsequent deliveries of proposals for new activities.

INTERNATIONAL RELATIONS: on target

Kenton Miller reported on several key international encounters in which he had participated since Council last met, notably with the President of the Federal Republic of Germany (to discuss IUCN's intentions towards the Sahel), meetings in the USA with representatives of Congress to discuss possible special grant support for IUCN's work and the launching of the Wetlands Campaign in Brazil by President José Sarney.

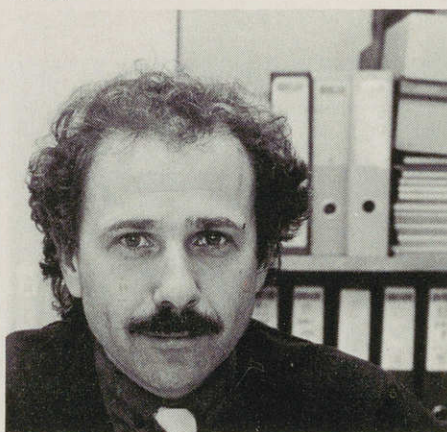
NEW FACES

PETER AMES joined IUCN in February as Director of Fundraising and Development. A graduate of Harvard College and Law School, his career has been devoted to legal, financial, and managerial problem-solving for several higher education and cultural institutions, most recently as Director for Finance and Administration at the New England Aquarium, USA. He will be responsible for identifying and soliciting new means of grant support for the Union. He will also examine ways to boost the cost-effectiveness of existing operations such as book-publishing and services to members.



Ames

EDWIN BROWN joined IUCN as Senior Accountant in January. He is a member of the Institute of Chartered Accountants of England and Wales. He has wide business experience, including several years as export director for a small European group of companies. For the last five years he has worked for the United Nations, first with UNICEF, then with the High Commissioner for Refugees (UNHCR) as Controller.



Brown



The Population Task Force follow-up meeting in March involved (clockwise from left) Hans Wagener, Francis Dennis, Susan Miller, Reuben Olembo, John Hanks, Jean Delaney, Taghi Farvar, Ferdinand Rath. Chairman Russ Peterson, indisposed through illness, left the picture under-populated.

POPULATION: front line problem

The debate moved back to population questions with the report of the Task Force on Population, which now includes representatives of the six IUCN Commissions as well as UNEP, FAO, Unesco, WWF, the International Planned Parenthood Federation, the UN Fund for Population Activities and the International Council of Scientific Unions. It is expected to produce a report in time for presentation to the Ottawa Conference. There was clear recognition that population is a world problem and that it must be tackled as an essential part of long-term development frameworks. A quorum of the Task Force met again in March to put the finishing touches to the Ottawa report.

SAHEL: measured response

Walter Lusigi introduced the report of the Council Task Force on the Sahel and other drought-affected regions of Africa. The report proposed a pincer strategy: promoting ecodevelopment at the local level while confronting broader causes of environmental degradation at national and further levels. Council voted its cautious support for the programme so long as IUCN's role was limited to scientific aspects and did not encourage people to think of IUCN as a development assistance agency.

Lusigi allowed that the report did not deal with population because it might cross lines with the Population Task Force, but assured Council that population questions would be taken into account. Dr Rustamov believed IUCN should be a nerve centre of activities for environmental rehabilitation in the Sahel. Council decided to approve the recommendations of the Task Force and, more, to set up a Working Group to develop a project proposal for organising a research, planning and training network for sustainable development in the region. Union President M.S. Swaminathan will head the Working Group and the network that emerges is expected to operate from 1986 through 2001.

BIOMES: streamlining efforts

Tropical Forest Officer Jeffrey Sayer reminded Council that a Swedish Government grant earmarked for tropical forest conservation in eleven priority countries, will continue for two more years. He outlined the major objectives of the current TRF programme. A special report in this *Bulletin* issue gives details.

Wetlands Officer Patrick Dugan warned that, to be successful in supporting the efforts of Members, the Secretariat would have to centre its efforts on a few countries each year. CEP Chairman José Furtado informed Council that PAC had endorsed the Wetlands Programme (with its current special emphasis on work in Brazil and China) but said he felt there was a need to stress the importance of wetlands as ecological processes and life-support systems, as well as economic resources in a conventional sense.

The Marine Programme has made important progress, reported Marine Officer Danny Elder, especially in the implementation of the Marine Mammals Action Plan in collaboration with UNEP. Scientific aspects of conservation in Antarctica were likely to cross over into the Marine Programme portfolio in the coming months, Council heard. □

APPLICATIONS SCREEN

Council has decided to establish a Membership Advisory Committee. The Committee will review all applications for membership and make recommendations to Council. Assigned to form the new Committee are Councillors Grenville Lucas, Parvez Hassan and David Munro.

The following organisations and institutions were admitted to membership at November's Council meeting:

- The Environmental Administration of the Republic of Korea (in the government agency category).
- In the national NGO category: The Indian Society for Himalayan Studies; The Nigerian Conservation Foundation; The Association for the Investigation and Propagation of Panamanian Species.
- International NGO: The International Snow Leopard Trust (based in the USA).

Council postponed a decision on the following institutions: Federation of Hunting Associations of the EEC; The Animal Protection Institute of America and I*Kare Wildlife Coalition (USA).

These three applications and interventions concerning them, with all new applications, will be scrutinised and recommendations made at the next Council meeting in 1986 at Ottawa, Canada.

Mediterranean: TIDE TURNING

IUCN continues to support a plan to ensure a cleaner Mediterranean free of oil slicks, garbage, sewage and factory wastes. The plan grew from the Barcelona Convention of 1975 under which Mediterranean nations agreed to work together to clean up their coasts and waters.

Total budget for the Mediterranean Action Plan under UNEP's Regional Seas Programme was increased to US\$4M in September last year and there have been dramatic results. For instance, pollution from industrialised areas around Marseilles has already been reduced by 90% as a result of plant modifications. According to UNEP however, ten billion tonnes of industrial and domestic waste is dumped into the Mediterranean each year.

IUCN's Marine Programme Officer Dr Danny Elder was in Athens early in December for a three-way meeting involving IUCN, UNEP and the Regional Centre for Specially Protected Areas (RCSPA).

The meeting brought together members of the coordinating unit for the Mediterranean Action Plan. IUCN was already involved in setting up a centre for specially protected areas, headquartered in Tunisia.



Photo: UNEP

Experts in place

IUCN has now provided two experts, on fixed term contracts, to work at the centre. They are FRANCESCA NAZZARO and ALAIN JEUDY de GRISSAC and part of their job is to compile and produce a directory of specially protected areas.

The sixteen nations involved in the Action Plan have agreed to several radical improvements. These targets include:

- the construction of sewage plants in all cities around the Mediterranean with populations exceeding 100,000.
- more port facilities to treat discharge water that tankers carry as ballast and sometimes illegally pump into the sea.
- the establishment of a traffic-control centre for ships to help prevent tanker collisions.

Recognising that environmental programmes are often first to be cut when government spending is curtailed, UNEP has begun an advertising campaign to tell the public in each nation what their government is doing to save a dying sea.

IUCN has agreed to help set guidelines and criteria for establishing marine and coastal protected areas in the region and to conduct a case study. The agreed protocol will ensure that information is pooled at a forthcoming working group meeting. The group will then produce recommendations to be presented to the contracting parties at the next meeting of the Barcelona Convention.

Beating the deadline

Elder believes it's not too late to ensure the Mediterranean's recovery, so long as finance does not falter.

"We're all very confident that we can make a difference," he says. "You only have to look at the Mediterranean Monk Seal, which epitomises the marine conservation problems of the region. It is now going to survive and perhaps even extend its range. Only a few years ago the conventional wisdom was that it would soon be extinct. It's a small victory of course, but it is a beginning. I expect to see more and more such gains in the future." □

Sahel moves

The Conservation for Development Centre in IUCN's Secretariat has begun to lay the groundwork for Union activities in the context of the Sahel. A specific workplan and budget have been sketched out for a six-month foundation phase and a three-year first phase.

To date, contacts have been made with a number of governments in the region and with a number of intergovernmental agencies to establish bases for cooperation. Several have expressed strong interest.

Development assistance agencies in Sweden, Finland, Denmark, Belgium, Canada and elsewhere have been approached; prospects for substantial support are good.

A full report on problems and possibilities in the Sahel will appear in print this year.

GEBEL ELBA — BLUEPRINT FOR TOMORROW?

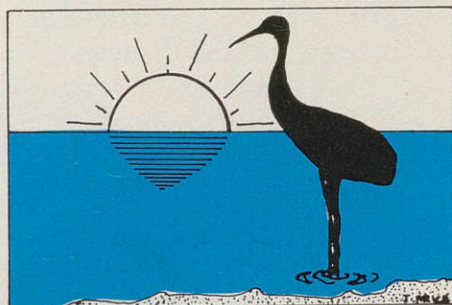
The Gebel Elba lies in a disputed border area between Egypt and the Sudan, on the Red Sea coast. It includes extensive wadi systems and mangrove swamps; it is fringed by important coral reefs and its upper reaches support a rich, cloud-fed vegetation. IUCN and WWF are seeking collaboration with the governments concerned to consider designating Gebel Elba a conservation area of 4,800 square kilometres. Such action would discourage hunting and fend off the impact of a new highway planned for the region.

There are 21 species of land mammals in Gebel Elba and great numbers of migratory birds from eastern and western Europe winter or rest there. The Gebel Elba proposal (*gebel* = mountain in Arabic) comes as a result of an initiative by former IUCN President Mohamed Kassas. The area's biological importance is recognised by both the Egyptian Academy of Scientific Research and Technology and the National Council for Research in Sudan.

Peace park?

IUCN and WWF have worked with the Egyptian and Sudanese Wildlife Services on plans to perpetuate the traditional culture of the Bischarin people of the area. The introduction to the project feasibility report calls for both countries to recognise the high conservation importance of the Gebel Elba site and to work together to establish a trans-frontier protected area of international importance which will foster peace and goodwill between nations.

An information brochure describing this notion in Arabic is being provided to schools and to the public. But while the two governments study the baseline report, change is already underway in the Gebel Elba. Local tribes, who customarily take only dead wood from the land, are beginning to cut green wood for sale in the Nile Valley. And hunters with automatic weapons have taken a toll on the wildlife,



particularly the Dorcas gazelle. These changes and others ensure that the area can never be as isolated as it once was but, so far, signs from both governments are that both agree on the cultural and environmental significance of the area.

IUCN protected areas spokesman Jim Thorsell, comments: "This may be one of those times when cooperation on a conservation issue can really make a contribution to understanding and peace in the world." □

Ethiopia Revisited

Ethiopia has been a Union member since 1966, but her links with IUCN date from much earlier. The savage side effects of recent droughts have prompted worldwide concern for the people of this ancient nation. IUCN's Sahel Task Force has Ethiopia's experience very much in mind as it tries to pinpoint the environmental factors that force the equation between drought and famine.

But IUCN's protected areas Programme Officer Dr James Thorsell was there late last year on a more cheering mission — to attend a Management Plan Workshop for the Bale Mountains National Park, southwest of Addis Ababa. The conference brought together 15 senior members of Ethiopia's Wildlife Conservation Organization, IUCN, WWF and the New York Zoological Society.

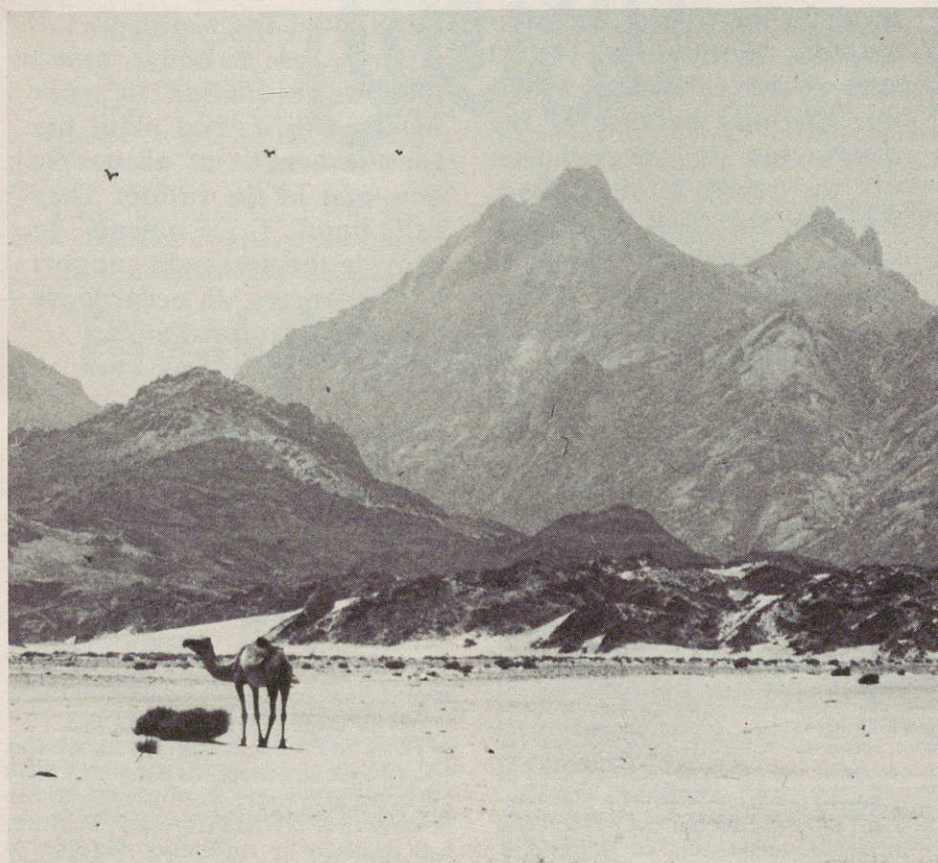
The Ethiopians are justly proud of their success in the park, generally recognized as the best Afro-Alpine site on the continent. One of the park authorities' most outstanding successes has been their work to boost the population of the Mountain Nyala, a project IUCN antelope specialist consultant Leslie Brown helped start up in 1966.

New links

Thorsell used the opportunity to meet with Ethiopian officials to discuss nationwide conservation needs and to design suitable project proposals. An IUCN Conservation Advisor will be appointed to work within nine Ethiopian parks to promote conservation work both within and outside park boundaries and advise on sustainable development techniques. The Advisor will also act as liaison with outside agencies to help stimulate their interest in conserving Ethiopia's natural heritage in step with measured development.

Ethiopia needs no convincing of the need to utilise resources sustainably which contribute to the development of the country. Innovative programmes already underway there include ostrich and crocodile farming and the humane production for export of musk from the civet cat for the perfume trade. The latter project brings in a million US dollars each year.

"The protected areas of Ethiopia contain some of the most spectacular natural features of the African continent, as well as sheltering many endemic species," said Thorsell. "Many are important water catchment areas and have high tourist potential. So Ethiopia's intention to collaborate with IUCN and WWF to ensure their effective management is very sound development planning." □



Gebel Elba

Photo: J. Thorsell

Botanic Gardens — time for growth

The world's botanic gardens have united to defend the earth's threatened plants. They will work together to conserve and preserve them as seed and in other forms in gene banks.

So promises the *Declaration of Gran Canaria*, reached in Las Palmas last November at a conference organised by IUCN with financial backing from WWF, sponsorship from UNEP, FAO and other international bodies and with exceptionally positive and thoughtful support from the Canarian authorities.

Two hundred plant experts from five continents met there to pledge themselves to curb the threatened slide towards extinction, during our lifetimes, of an estimated 60,000 plant species worldwide.

The President of the Island Council, Carmelo Artiles Balaños, greeted the Declaration as: "a positive message that all who are involved in caring for the living world and the living resources we all depend on, should take to heart."

IUCN Plants Officer Ole Hamann summed up the problem in his address to the opening session of the conference.

"What can botanic gardens, especially in the tropics where they often lack adequate facilities and support, and where many countries simply do not have a single botanic garden, do to prevent a botanical disaster?" he asked.

The *World Conservation Strategy* was, he suggested, their most feasible starting point, thanks to the backing of UN agencies and the majority of the world's governmental and independent conservation organisations and interest groups. The Las Palmas meeting was invited to come up with a plan of action, based on the *Strategy*, to help bring botanic gardens into the front line of plant conservation.

Resolutions

Among the 12 follow-up recommendations adopted by the conference were:

- proposals for a recognised global network of botanic gardens, with an organising body of its own, regular assemblies and an agreed agenda for action published in the form of a Botanic Gardens Conservation Strategy
- a call for a special drive to boost the numbers and scope of botanic gardens in the tropics and sub-tropics, marshalling extra international support for their work and multiplying their opportunities for training exchanges and other cooperative ventures
- practical suggestions for linking the work of Botanic Gardens to that of other protected areas programmes and to overall natural resource development efforts in agriculture, forestry and elsewhere

THE DECLARATION OF GRAN CANARIA

For centuries, Botanic Gardens have been major centres for the scientific study of plant diversity, providing a mechanism for introduction and assessment of plants for agriculture, horticulture, forestry and medicine.

They attract more than 100 million visitors a year, affording havens of beauty and tranquillity for an increasingly urban society, and a spiritual link with the plant world on which we all depend.

They inform and educate, they are showcases for the living world, places where science and people meet.

For historical reasons, most Botanic Gardens are in the cooler, more industrialised countries of the world, but two thirds of all plant species occur in the tropics and sub-tropics. More than 60,000 species risk extinction within our lifetimes because of the destruction and degradation of the earth's vegetation, which is the basis of human survival. Recently, many of the world's Botanic Gardens have mobilised their resources for conservation action to avert this threat. They are conserving plants in the wild, cultivating them in the

gardens themselves, and preserving them in gene banks.

Recognising that they can only succeed in achieving these objectives if they work together, Botanic Gardens throughout the world are uniting to apply the *World Conservation Strategy* to the special predicament of plants. Basing their efforts on this global plan for sustainable development and conservation of living resources, they will produce, adopt and implement a *Botanic Gardens Conservation Strategy*.

This declaration is the result of the 1985 Las Palmas Conference on Botanic Gardens and the World Conservation Strategy, involving more than 200 leading specialists from countries throughout the world.

They, as a body, assert their determination to work together to defend plant life for the benefit of all people now and in the future. They call upon Governments to provide the necessary support and resources, in accordance with their responsibilities.

30 November 1985
Las Palmas de Gran Canaria

- plans to involve botanic gardens in conservation in the wild, of critically threatened plants, especially in fragile ecosystems where many very highly specialised native plants occur: islands, tropical rainforests and special sites of mediterranean-type vegetation such as Cape Fynbos in South Africa
 - a general call to governments to recognise the principle of free exchange of useful plant materials between countries in the interest of conserving threatened species, and to set basic international standards for storage and care of seeds in gene banks
 - a resolution to build-up the educational role of botanic gardens everywhere in a systematic and imaginative way and in concert with other educational institutions — schools, zoos, museums and youth associations.
 - a request to IUCN to take on a major role in helping realise this agenda.
- The most substantial input to the meeting was a draft of the proposed *Botanic Gardens Conservation Strategy*, compiled by British botanist Prof. Vernon Heywood. The draft was reviewed by conference delegates to open the way to publication of a final version during 1986. □

CNPPA GOES SOUTH



Bariloche scenes: (top left) IUCN Regional Councillor Marc Dourojeanni with Paraguayan and Cuban delegates on field trip; (bottom left) President Raoul Alfonsín inaugurates the opening session; (top right) IUCN wetlands spokesman Pat Dugan chats with US Fish and Wildlife Service delegate; (bottom right) IUCN protected areas spokesman Jim Thorsell meets border patrol rangers during field trip. Photos: J. Thorsell

Members of the 27th working session of IUCN's Commission on National Parks and Protected Areas (CNPPA) have identified a variety of threats to protected areas in the Neotropical realm of South America. The meeting, (held in Bariloche, Argentina and hosted by Argentina's President Raul Alfonsín) reviewed the current conservation status of the 350 protected areas in the region. Delegates agreed these areas are in serious trouble due both to constraints posed by the debt crisis and from declassification, inappropriate internal development, and illegal narcotics cultivation. Delegates singled out situations in Brazil, Argentina, Costa Rica, and Venezuela for special attention in resolutions. Argentina's president told delegates

that the debt crisis "will undoubtedly generate greater pressures on our natural resources", and called for solutions that "make growth and preservation of resources compatible."

Seventy-one senior park agency officials and representatives from NGOs, Unesco, FAO, UNEP, and the US Department of Interior made up representations from 22 countries for the six day conference, 9-14 March 1986. The technical session was co-chaired by IUCN's Vice President and CNPPA Deputy Chairman Marc Dourojeanni and by Dr Jorge Morello, Director of the host Argentine National Park Administration. Commission Chairman Harold Eidsvik and Executive Officer Jim Thorsell also attended.

Breakthrough in Bogota

The Columbia Inter-American Congress of Planning (*Sociedad Interamericana de Planificación*) met to talk about environment in Colombia 25 to 29 November. IUCN's Senior Advisor on Sustainable Development and Executive Officer for CEP, Taghi Farvar, was there to present a keynote address based on papers by several other IUCN specialists.

According to Farvar, the meeting was important for two main reasons. It was, he says, not unusual for planners, economists and others to gather to talk about planning but it was the first time ever they had chosen the theme of environment: "as the major axis around which the planning process should revolve."

"It was", he says, "the first time in Latin America that the environment was address-

ed by planners in a central way and not as a subject apart. That should mean future mistakes can be avoided."

Because career planners — unlike many politicians — think in a long-term manner about roads, industry, agriculture, urban affairs and so on, they have the scope to integrate environmental imperatives into those long term plans, says Farvar. He sees the Congress as a first blow in a struggle to integrate environmental planning for sustainable development into every facet of development.

"Many countries have set up environmental departments and most of those have found themselves sectoralised and isolated. There is a new awareness that this approach will not work", Farvar says.

First for integration

Hence the other special aspect of the meeting, in Farvar's view; the wide range of different sectors represented at the Bogotá meeting, a good omen for more integration between these sectors in the future when environment is at issue.

There were, for instance, representatives of Colombia's Ministry of Planning, her National Institute of Natural Resources and the Environment, and the Central Mortgage Bank of Colombia. International representation included the OAS, many universities and other educational and cultural organisations from elsewhere in the region. UNEP and the Economic Commission for Latin America sent delegates from their joint environment and development unit based in Chile.

Breakthrough

Farvar believes the meeting achieved a breakthrough in communicating the essential message of sustainable development. IUCN found agreement with other participants on the need for change in environmental thinking and in economics, made feasible by strategic conservation planning.

"Such agreement would not previously have been possible," says Farvar. He believes a basic problem in South America (as in most developing regions) is that countries have followed an imitative style of development.

Delegates agreed that a different style of development is called for, a lasting development that will not continue to indebted them. Farvar describes their conclusions as evidence of: "a new social awareness which is sinking in where it counts — with the decision makers". This he believes will strengthen the call for: "a new model of planning based on merging environment and development into one thing — sustainable development."

Bitter examples

IUCN's report to the conference offered no lack of examples from other regions to illustrate the problems that tend to spiral from unoriginal planning approaches. Even many of the problems of the Sahel are, the paper pointed out, directly related to pressures such as the spread of sedentary agriculture into environments ideal for pastoral nomadism, to satisfy insensitive planning models.

The answer to some of the problems may already be emerging in South America with: "an upwelling of anger against a system that simply has not and will not work and a clamouring for change, the reverberations of which will be felt not only in South America but in other imprisoned economies as well", suggests Farvar. "The sad thing is", he concludes, "it has taken so long to get the message across to developing and developed nations alike. The encouraging thing is, it is not too late." □

Big fish eat out Lake Victoria

A REPORT in the scientific journal *Nature* and a press statement issued late last year by IUCN speak of recent disastrous effects of the introduction of Nile Perch (*Lates niloticus*) into Africa's largest lake, Lake Victoria. The giant predator has caused populations of many of Lake Victoria's native fish species (including cichlid species of high export value as aquarium fish) to collapse towards almost certain extinction. Rather than boost the lake's fishery potential, the Nile Perch could reduce the lake's overall productivity by 60 to 80 percent, according to UN Food and Agriculture Organization estimates.

FAO not involved

Successive stocking experiments have involved a number of African and outside organisations but it is unclear how the original introduction was allowed to happen. FAO says reports which implied that the agency had given tacit backing to the Nile Perch introduction into Lake Victoria have no basis in fact and FAO has a rigorous policy governing all its own projects which involve introductions of fish for aquaculture into new waters.

FAO has worked out (through the European Inland Fisheries Advisory Commission and in partnership with the International Council for the Exploration of the Sea) a detailed code of practice for impact assessment and step-by-step testing to guard against ecological damage from introduction schemes. Other procedures are being considered for application in Africa, Latin America and Asia.

FAO certainly doesn't condemn introductions outright. "You can't do without them", points out Dr Robin Welcomme, a senior officer in FAO's Fisheries Department. "Most of the world's aquaculture is based on introduced species and there are far more success stories than there are tragedies like Lake Victoria. Even there, after a big drop in the level of food production, there may be a degree of recovery founded on another introduced cichlid species, *Tilapia nilotica*".

FAO is monitoring the situation in the lake through its intergovernmental sub-committee for Lake Victoria and is working with a number of official and private organisations to help mitigate the problem, through selective fishing for the Nile Perch.

Sensitive subject

Recent plans to introduce Nile Perch into several waters in Queensland, Australia were safeguarded by a thorough assessment and screening procedure. Nevertheless, public outcry sparked off by the Lake Victoria problems has led to the plans being quashed.

"It's obviously a sensitive subject", says IUCN Director General Dr Kenton Miller. "The Australian scheme was planned to

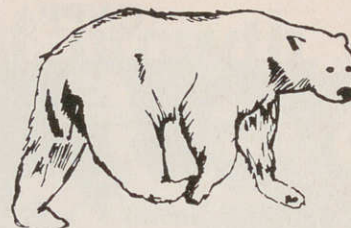
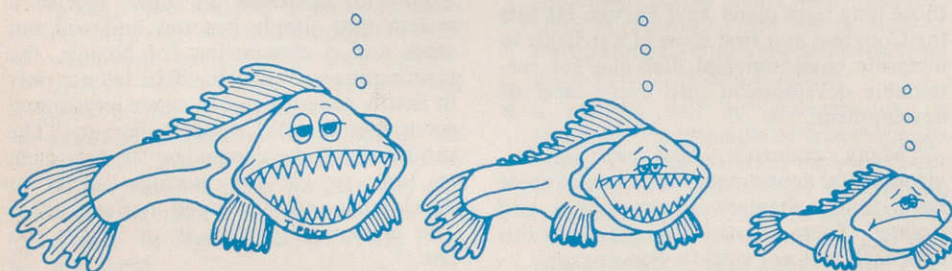


The threatened cichlid harvest...



... and the culprit

provide a sport fishing resource in man-made reservoirs. In countries which have species-rich natural waters but where food is scarce and income are low, it's easy to see how restricted the choices become." □



True North

A TOWN on Hudson Bay is complaining about a Canadian Government plan to rid its streets of polar bears. Residents of Churchill (population 1,900) say the bears can be a nuisance — they killed a man on the main street two years ago — but they also bring in tourist dollars.

As many as 1,000 of the bears, many weighing over 500kg, migrate past the town in the spring, going south to breed and later travelling north to hunt for seal on the ice of Hudson Bay.

Residents commonly find the bears in their gardens: conservation officers shoot them with drug darts and airlift them back to the wilderness.

Businessmen are angry, saying that removing the bears is deterring tourists. Last autumn a number of flights to the town were cancelled because there were no bears to be seen. Local tourist operators want a refuse dump reopened to the bears because they fear losing Can\$1.9 million (US\$1.5 million) each year if the bears are kept away from the town.

Coral debate

A SEMANTIC debate may threaten the future of coral reefs worldwide. Switzerland and Liechtenstein say their trade in coral cannot be controlled under the Convention on International Trade in Endangered Species (CITES) because coral is not an animal or skeleton (both covered by the treaty) but simply excreta. "The fact that the skeletons are essential for the survival of the polyp colonies does not change this situation," say the Swiss.

CITES experts say that even if the Swiss argument were valid, there is still precedent for control because Convention signatories control the trade in other secretions, such as deer musk and ambergris.

UN response

THE SECRETARY GENERAL of the United Nations, replying to a message sent from IUCN's Director General on the occasion of the UN system's 40th anniversary, recently sent his assurance that the World Charter for Nature and other major international instruments adopted in the field of environment will continue to give inspiration and guidance to the system's efforts. The Secretary General is "... convinced that the work of the United Nations Environment Programme, and its cooperation with other important organisations such as yours, will continue to help all nations to deal effectively with the serious environmental problems which are facing the international community."

World Heritage

The annual meeting of the World Heritage Committee was held at Unesco headquarters in Paris from 2-6 December 1985. IUCN attended to advise on selection of natural sites for designation under the World Heritage Convention. Eighty-eight states now belong to the Convention.

IUCN protected areas spokesman James Thorsell recommended five new world sites for inscription, three in India (Manas Wildlife Sanctuary, Keoladeo National Park and Kaziranga National Park), one in Peru (Huascayan National Park) and one in Turkey (Goreme Valley). The additions bring to 61 the number of natural areas on the World Heritage Convention list.

But the news was not all good. Thorsell recommended two further sites for listing on the World Heritage In Danger list; Tai National Park in the Ivory Coast and Ichkeul National Park in Tunisia. His report said that those areas are under such threat: "that the reasons for putting them on the Heritage List will soon have disappeared!"

Inclusion of one of their sites on the list brings prestige and often extra tourist revenues to the nations concerned. This is sometimes viewed as a mixed blessing. Yosemite Park in the US for instance, has more tourists than it can accommodate. However, most tropical areas would welcome a substantial increase in tourism. The Salonga National Park in Zaïre, for instance, is one of the largest parks in the world but hosts only about ten visitors a year.

Galapagos recovers

Fire damage to the Galapagos Islands in the spring of 1985 appears to have been less severe than first thought.

Members of the Charles Darwin Foundation meeting at IUCN headquarters 20-21 March 1986 reported that, as far as can be determined, no tortoise or iguana were lost but large tracts of habitat did suffer along with many bird species.

Among those threatened are the Galapagos Rail, Darwin Finches and Galapagos Doves. A damage report indicated there was major damage to soils and in one area *Saponia saponaria* (an indigenous tree that grows to 20 metres) was wiped out. However, it seemed the overall damage was less than expected.

Bay of Gokova

IUCN has offered to help a member country to relocate a proposed power development at the Bay of Gokova at the southwestern tip of Turkey. The area is the planned site of two thermal-electric plants (210 megawatts each) and a proposed third plant.

The Bay of Gokova is where the Mediterranean meets the Aegean sea and where many archeological ruins and historic sites exist alongside teeming marine life and fauna.

IUCN Director General Kenton R. Miller told Turkey's President Kenan Evran that IUCN "is most concerned" about news of the project because of the potential risk to

the area's unique fauna and flora and because the region's natural beauty is a spur to recreation and foreign tourism.

Miller conceded the importance of the project but cautioned against a decision taken purely on the basis of market value analysis, not taking into consideration many of the indirect economic benefits of natural sites. "We are most concerned about the future of Gokova Bay and would therefore like to offer our help and experience in the choice of an alternative site for the construction of a thermal plant", said Miller.



Chinese biologist with baiji dolphin found dead in the Yangtze. Photo: WWF/Gaskin

CHINESE DOLPHINS

There are fears that the freshwater dolphin, or baiji of the Yangtze River may be in worse trouble than ever. The Cetacean Specialist Group (CSG) of IUCN is mobilising to help scientists and conservation authorities of the People's Republic of China in their effort to save the baiji from extinction.

The action follows a recent report of census surveys carried out by scientists at the Institute of Hydrobiology at Wuhan from 1978 to 1983 which estimate that only about 150 *baiji* remain in the Yangtze. They are divided into about 20 groups distributed along 1600 km of the river. More may inhabit the Han River and Poyang and Tongting Lakes, but the total population is almost certainly only a few hundred, distributed in a fraction of this elegant mammal's former range.

According to the Wuhan group, the causes for the decline are decreasing food supply because of fishing, incidental kill by fishing nets and hooks, collisions with large and small vessels (industrial river traffic is increasing) and some deliberate kills by local inhabitants who are unaware that the dolphin is endangered and completely protected. A recent newspaper account stated that 22 *baiji* died from various causes in the past year. The true figure is probably higher still.

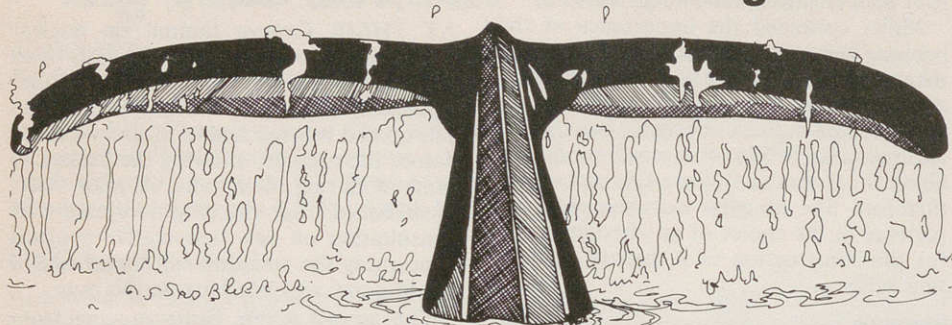
However, the issue is receiving high priority within the Chinese government. A conference at the national level was convened by the Ministry of Urban and Rural Construction and Environmental Protection to discuss the plight of the mammals. There is now a proposal to translocate a number of *baiji* to a 1.5 km by-channel of the Yangtze that can be sealed at both ends.

CSG member David Gaskin of Guelph University, Ontario, Canada recently visited the site and says conditions are suitable. There will be a research facility, a holding pool for new animals and a hospital for wounded specimens that are sometimes retrieved from fishing gear. The breeding colonies will be expensive to create (US\$0.25 million to build and equip the first semi-reserve) but it is generally agreed that the habitat of the *baiji* will go on deteriorating for some time and that the only hope to save the species is to develop captive and semi-captive breeding colonies.

A workshop will be convened by the Academia Sinica and SSC in Wuhan next October, to be organised by the Wuhan group, Nanjing University and the CSG. Participants will be experts on captive breeding of dolphins and specialists working on river dolphin research in China, Brazil, Uruguay, Peru, Argentina, India, Pakistan, Bangladesh and Nepal. The group already has some help from the New York Zoological Society but is attempting to identify other sources as well.

For more information on the conference, contact William Perrin at the Southwest Fisheries Center, La Jolla, California, 92037, USA. □

Northern Pacific Whaling



The Government of the Philippines is defying the International Whaling Commission's (IWC) moratorium decision and continuing to catch Bryde's Whales in the north Pacific. The Philippines is party to both the IWC and CITES conventions and despite many opportunities (and unlike Japan) it has not lodged objections to the moratorium.

In a letter of 26 September 1985, the Minister-Counsellor of the Embassy of the Philippines in London said his government considers it entirely proper that the islands' whaling fleet continue its small-scale operations until 1988. The letter argued that: "considerations relating to serious economic and social conditions, as well as the principle of equality in the access to resources belonging to mankind" have made it "appropriate" for the Philippines to carry on whaling.

The Philippines started commercial whaling in 1983. Trade in Bryde's Whale products is prohibited by CITES. IWC Commissioners say if the Philippines continues whaling it is in violation of international law. An IWC statement said: "By its mockery of long-standing treaty law, the Philippine announcement has far-reaching implications, not least for the continued existence of the IWC."

Japan Turning

Meanwhile a group of US environmental organisations has won a court battle with the American government. The suit was filed when the government failed to apply fisheries sanctions against Japan for its violation of the IWC's ban on sperm whaling. If the US 'certifies' Japan it would mean a cut of at least 50 per cent in Japan's take of fish in the American 200-mile zone, at a value of more than US\$250 million.

Partly as a result of these moves, Japan has told the US Government that it intends to withdraw its objection to IWC's 1982 moratorium on commercial whaling. The US had agreed to waive sanctions against the Japanese if Japan withdrew its objection. Conservationists challenged the bilateral agreement on the grounds that Congress had made sanctions mandatory and the agreement itself would diminish the role of IWC.

A District Court judge has already ruled against the US Government and if the decision is upheld Japan says it will withdraw its objection with effect from 1988.

The Japanese have also agreed to work with IWC in an attempt to tighten up Convention definitions such as "small-scale

commercial whaling" which presently offer loopholes to countries claiming exemption.

Some conservation groups are skeptical about the intentions of the Japanese whalers, on the grounds that there is nothing to prevent their revoking the withdrawal of their objection to the moratorium after the legal challenge has run its course. □

Underwater acrobats at risk

EVIDENCE OF damage to bird life near acidified rivers and streams has come from a survey on the breeding distribution of dippers in Wales, UK.

The survey extends the knowledge of scientists exploring the environmental effects of acid precipitation. Until now, links between the change in chemistry of water courses and a decline in water creatures was based mainly on studies of fish.

The work, carried out in 1984 for IUCN member The Royal Society for the Protection of Birds (RSPB), is believed to be the first published record of the impact of acidification on any bird species in the United Kingdom.

Dippers are unique among passerine birds in their close association with flowing rivers. They feed on macro-invertebrates

such as caddis larvae and mayfly nymphs, by diving, swimming and walking underwater. The scientists studied breeding dippers at sites on soft water streams in areas of Wales where historical evidence showed several rivers had become more acidic in recent decades. The RSPB team said the absence of dippers from soft water streams draining out of conifer forests is particularly important. Conifers act as a filter for airborne pollutants, but after heavy rains the acid fraction tends to run off into water courses.

The researchers conclude: "Any acidifying influences on soft water streams is likely to be detrimental to dipper populations". The dipper is a valuable indicator species whose numbers and breeding success meter the health of a river or stream.

Plant threat

ONE OF Britain's rarest wild plants, the Monkey Orchid, now faces its gravest ever threat of extinction, after the theft of 13 seed-heads from a meadow in Oxfordshire last year.

IUCN member The Royal Society for Nature Conservation, which gives round-the-clock protection to the orchid only when it is in flower, said that losing the seed crop "puts the plant in jeopardy". The Monkey Orchid is almost extinct in Britain. There are 13 plants in Oxfordshire and a few in Kent.

The situation is doubly tragic because Kew experts say that although the thief knew about the orchids and where they were, "he did not know that the pods were not fully mature and the unripe seed will now not germinate."

The Royal Botanic Gardens in Kew, have spent four unsuccessful years trying to germinate the seeds artificially.

If the thief is caught he faces fines of up to £13,000 (US\$15,000). Under the Wildlife and Countryside Act of 1981, it is an offence to dig up any wild plant without the owner's permission, but 62 endangered species, including nine orchids, are given total protection, with a maximum fine of 1,000 pounds for each specimen dug up or picked.

WILDLIFE FARMING IN THAILAND

Recent joint efforts of the Royal Forest Department and FAO to farm pheasants and deer in Thailand have attracted worldwide attention. The Department has already established six Wildlife Propagation Centres in which indigenous species of pheasant and deer are successfully raised.

The immediate objective of safeguarding the survival of endangered species of pheasants, peacocks and deer has now been attained, with the exception of the Thai race of Eld's deer which is almost extinct in the Thai wild. The next phase will be to liberate surplus stocks of pheasant and deer in areas well protected against poaching.

Under the joint project a consultant has advised the government on developing deer farming. A model and research farm has now been established in the Khao Soi Dao Wildlife Propagation Center in Chanthaburi province. The idea is to build up sufficient numbers of sambar, Eld's deer (from Burma or crosses between the Burmese and Thai races) and Hog deer for further release to villagers to set up commercial deer farms under the guidance of trained government personnel. According to FAO consultant Anton de Vos, the farming of deer can provide "much-needed protein, hides and other products, as well as employment for the local people".

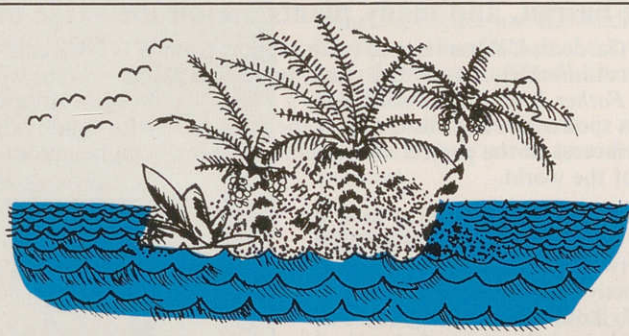
Spreading the Message

A THREE-DAY meeting on Mass Communications and Environmental Protection in the Caribbean Region brought delegates from ten countries and territories in the Caribbean basin to San Juan, Puerto Rico, 3-5 February. The meeting's agenda centred on the use of mass media in environmental awareness, protection and planning, with special emphasis on the Caribbean and application to similar developing regions.

Speakers and official observers from (amongst others) UNEP, Turner Broadcasting, US Fish and Wildlife Service International, Caribbean Conservation Association and Yale University's Tropical Resources Institute, attended.

Environmental literacy

Education Commission Chairman Dr Gerry Lieberman gave the keynote address for IUCN. He stressed the need for 'environmental literacy' to ensure that important conservation steps are not "undone in a single generation or less by poorly informed decision makers. There is", he said, "an urgent need to have a better educated public and more trained conservation professionals" to help prevent this slippage.



Lieberman spoke of four priority goals derived from *World Conservation Strategy* axioms:

- to build resource management concerns into policy-making processes in public and private sectors
- to increase the technical capabilities of responsible professionals
- to boost understanding of living resource conservation and management among the general public
- to nurture conservation principles in young people — tomorrow's resource consumers and managers.

These notions, he remarked, went far beyond what is conventionally understood by environmental education. "They concentrate on teaching people how to live in a sustainable relationship with the resources

on which they depend. At the same time... they focus on the modification of day-to-day actions and policy making."

PVO power

Lloyd Timberlake of Earthscan spelt out the real infrastructure necessary to reach a global public. "In mass communications", he said, "it requires about eight times as much effort and money to disseminate information as to produce information. Too often groups devote most of their resources to publishing a booklet or brochure, mail it to a few people then keep hundreds stacked in the back of the office. If there is no up-to-date mailing list with precisely the right sort of people on it, then it is pointless to produce a document in the first place."

But even if dissemination is first-class, he pointed out, the materials could often seem too long-range to affect local and topical realities. Earthscan (with grant support from several Scandinavian countries) is now working to equip local private voluntary organisations (PVOs = NGOs) in India, Indonesia, Tanzania, Zambia and elsewhere with the capacity to upgrade their own communications facilities. Under this programme, regular workshops put established journalists and special-interest writers in touch with a selection of living resource specialists active in the same country. The programme also includes co-syndication of feature materials to reach more language groups, direct mailing of on-target materials to decision makers, and travel or other grants for journalists and photographers specialising in environmental subject matter.

Caribbean waves

Roderick Sanatan's paper about the special features of media work in the Caribbean region revealed literally dozens of different resources available at one level of technology or another, from Caribbean literature and popular music through to satellite relays for region-wide television.

Recommendations that emerged from the conference urged:

- that environmental education should become a primary concern of the Caribbean Conservation Association
- that participants should return to their own countries determined to work towards comprehensive national plans for environmental education and protection
- that Earthscan-style workshops should be arranged for Caribbean countries

through CARIMAC and other organisations.

The meeting was organised by the Department of Natural Resources and Environmental Quality Board of Puerto Rico, with several co-sponsors. □

River course to destruction

IN THE LATE 1960s, the US Army Corps of Engineers launched a project to rechannel a meandering 100km stretch of Florida's Kissimmee River in the Everglades to provide flood control and easier navigation. The result was a straight 48-mile canal that severely decreased the flow of water to the surrounding wetlands.

By draining the wetlands, the new canal quickly led to degradation of fish and wildlife habitat in the river basin, and a decreased supply of fresh water to the aquifers on which cities along Florida's southeast coast depend.

Now, Florida would like to repair at least part of the damage. The state governor has made restoration of the Everglades' ecosystem a top priority of his administration, and supports a plan to partially backfill the canal. The South Florida Water Management District has already received permits — but no funding — to place three weirs along the canal to divert water back into the Kissimmee's original streambed. This testing stage of the restoration project is expected to cost US\$1.4 million.

Canada: aid lobby

THREE Conservation groups have praised the Canadian Government's pledge of more money for development assistance but they have told a government committee that a greater proportion of Canadian aid should go toward conservation of natural resources worldwide.

The Canadian Wildlife Federation, WWF-Canada and the Canadian Nature Federation made their submission to the Special Joint Committee on Canada's International Relations held in November.

The organisations strongly urged that a cornerstone of Canadian foreign policy should be the implementation of the priority international actions set out in the *World Conservation Strategy*. Among other needs, the organisations called for:

- more multilateral and bilateral assistance for reforestation and for restoration of degraded environments
- cooperative programmes for conservation of tropical forests
- cooperative programmes for conservation of drylands
- a cooperative programme for the on-site protection of the wild relatives of economic or useful species, of threatened species, and of ecosystems of exceptional diversity.

The lobby noted that — apart from Environment Canada — government departments were often aware of priority conservation needs but made no active efforts to meet them. "Such efforts", said the IUCN members, "are long overdue."

Acid Rain Controls Bite

The US Congressional Research Service says acid rain controls in Canada are expected to reduce sulphur dioxide emission by half, to 2.3M tonnes a year in 1994. By comparison, the service says that sulphur dioxide emissions in the United States may increase to above the present 24.1M tonnes per year.

It is estimated that more than 48,000 Canadian lakes and watercourses have been damaged by acid rain in central and eastern Canada. But the American report does not unequivocally approve of Canadian efforts, saying that tighter controls on Canadian automobiles, introduced last year, do nothing more than copy American standards which have been in place in the United States for four years. However, the Americans praise Canada's sulphur dioxide control programme because it surpasses current US standards by requiring "significant reductions" by existing facilities beyond standards necessary for human health.

Self-control

Meanwhile, in Europe, the French Government has decided to introduce a system of 'mutual air insurance'. A charge has been levied in respect to sulphur oxide emissions by thermal installations of greater than 50 megawatts capacity. The money will be shared out fully among industrialists investing in equipment to reduce pollution emissions. The scheme should make it possible to do better than the 1984 objective of reducing sulphur emissions in France by 50 per cent between 1980 and 1990. □



Green light for Heritage

AT THE World Heritage meeting in Paris in early December, the United Kingdom announced it was pulling out of Unesco. There was, however, some good news too.

Great Britain made it clear that, despite the announcement, it remained strongly committed to the principles of World Heritage sites and would continue to support the programme which is administered by Unesco.

In continuing support Britain was following the lead of the US which earlier announced its intention of withdrawing support from Unesco but agreed to continue annual dues to the World Heritage programme.

Alligators

REUTER NEWS Agency says the number of Chinese alligators, found only in the Yangtze River, has doubled since 1982 to about 1,000 thanks to artificial hatching techniques.

Bangkok flood control

BANGKOK'S FLOODS can last for several hours, or for days or weeks. When that happens, there is not only a lack of drainage but flooding occurs through the waterways which, under normal circumstances, drain whole areas.

The city's canals join the Chao Phraya River, which flows into the Gulf of Thailand. There, ocean tide pressure can reduce drainage. Originally it was proposed that a bypass canal be employed to drain

into the Gulf waters but, experts believe, it would be hampered by the same problem as Bangkok: lack of gravity drainage, particularly late in the year when tides rise.

Now the National Environment Board of Thailand thinks it may have the answer to the problem. In order to defeat the effect of tides on populated areas some canals will be provided with sluice gates which can be opened or closed following instructions from a computerised central switchboard.

Collected data will allow rapid computation of levels permitting individual sluice gates to be opened and closed on cue from the computer installed along the river. Authorities say the system will allow optimum usage of available gravity drainage and provide an observational basis for a thorough study of Bangkok's floods.

The NEB warns, however, that the computer is not a magic tool. In its monthly news bulletin it says that environmental problems anywhere in the world present investigators with almost identical hurdles caused by lack of reliable ground truth and that "the present day trend to make up for such a lack through computer modelling does not really get around this difficulty."

"BABY'S TOES" RESCUED

The tiny island of St Helena, a UK dependency in the mid-South Atlantic, has a unique flora, with an estimated 40 species found nowhere else in the world. However, two thirds of the isolated island are barren, and many plants are on the verge of extinction.

Now Kew Gardens, UK has rescued (with support from WWF-UK and the UK Overseas Development Administration) several vitally important plants — some with strange names such as *Old Father Live Forever* and *Baby's Toes* — and begun large scale replantings. Kew Gardens spokesmen say this is one of the most successful conservation stories of the century and success of the project means similar schemes can be put into action in many other parts of the world.

The island where Napoleon spent time in exile became the medium for rejuvenation of plant life two years ago. On St Helena, the most effective way of saving the native flora is fondly known as 'green glue'. The good, the bad, and the ugly of the plant world are propagated at Kew Gardens and transplanted on the island to form a ground cover that in effect glues together soil eroded by grazing goats and the encroachment of weeds imported by man. Before the plan was implemented some species were hanging on by a single plant and 18 of 40 formerly flourishing plants were endangered. The island ebony, a plant presumed extinct for 100 years was rediscovered. *Commidendrum rotundifolium* was returned to Kew, and two years later there are one thousand growing on the island and specimens have been sent as far away as Hawaii. Gren Lucas, Keeper of the Herbarium and Chairman of IUCN's SSC, says the new techniques being employed on the island can provide a blueprint for other areas. The species being replanted help reverse the erosion problem. "The technique's application in other parts of the world suffering drought is tremendously important," Mr Lucas said.



WWF Anniversary

Conservationists from more than 30 countries will walk, in a spirit of pilgrimage, to the central Italian town of Assisi in September to celebrate the launch of an awareness, training and education campaign to commemorate World Wildlife Fund's 25th Anniversary. Assisi is the birthplace of St Francis, patron saint of ecology, and symbolises the Franciscan vision of harmony between man and nature. Spiritual leaders of the Buddhist, Christian, Hindu, Islamic and Jewish faiths will lead a two-day meditation on the conservation ethic each faith incorporates. A simultaneous conference of leading media, education and rural development achievers will talk of way and means to spread the conservation message.

The art of the IMPOSSIBLE

a report compiled by
JEFFREY SAYER
and
JULIA WHEARE

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VIEWS EXPRESSED IN
THESE PAGES
DO NOT NECESSARILY
MATCH THE OFFICIAL
POLICY OF IUCN OR ITS
MEMBER AND PARTNER
ORGANISATIONS

SUCCESS

surprise factor in TRF conservation

Kenton R. Miller

111,000 km² a year of tropical forests are being felled and burned; at this rate, all of these forests will have disappeared within 85 years. The most valuable and richest in species, lowland rain forests like [those] of southeast Asia, are believed unlikely to survive to the end of this century.

World Conservation Strategy (1980)

AT FIRST glance it seems little has happened in the past five years to change the *World Conservation Strategy's* sombre prediction of rainforest loss. In fact, some pressures that seemed to be easing five years ago have found new strength and others, previously little feared, are beginning to force themselves on our attention.

For instance, foreign debt pressures are today pushing many countries to intensify exploitation or replacement of forested wilderness to boost best-selling exports or to try (without much success) to replace costly imports such as petroleum with home-grown products like biofuels. Even tropical countries which have few external debts are now having to mine, harvest or grow more cash goods for smaller returns as the effects of economic recession hit the US and other major export markets.

Yet, generally speaking, political conditions have improved since 1980. Events like the Paris tropical forest summit (reported on below) show that politicians are now giving the problem their attention. In the tropics themselves, many governments have moved spontaneously towards applying resource management to forests and the river systems they protect, rather than simply 'mining' timber or hydro power from them. And many (with or without encouragement from development agencies and banks) are now stipulating more rigorous assessment of the ecological and social impact of projects in sensitive forest areas.

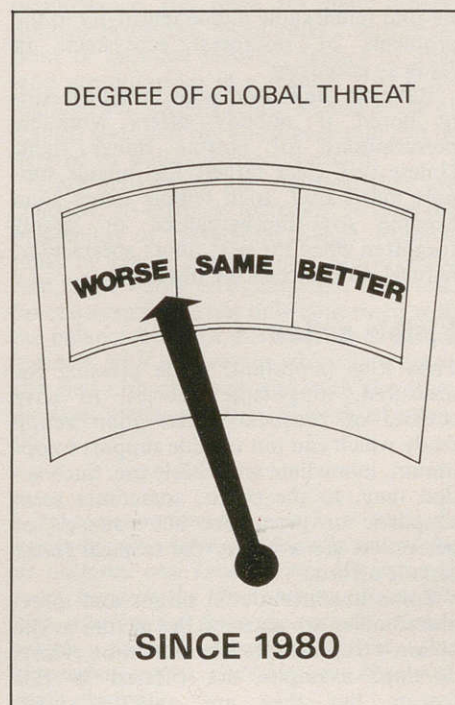
On the debit side, particularly in Central America, civil and border conflicts have lately pushed hungry people into many rainforest areas previously thought too remote for settlement. Another kind of refugee, the government-sponsored settler (in, for example, Indonesia or Brazil) spearheads a new kind of pressure on today's rainforest.

Nowadays not all such settlers are identifiable as the passive victims of circumstances spoken of in the *Strategy* — poor rural people forced against their better judgement to abandon a heritage of wise resource use.

Instead, many are veterans (or the second or third generation posterity) of massive population movements from rural outback to urban fringe between 1940 and 1960. Some have never planted or harvested a crop in their lives. And many of those who do have farming experience are not traditional subsistence farmers but displaced market producers used to dealing in cash and keenly aware of political realities. Though some are driven to resettle by 'acts of God' like drought, many are adventurers with a land-hungry pioneer mentality.

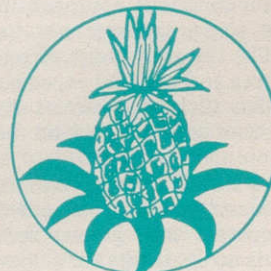
The resettlement dream is already losing its gloss for many of them and it would be no surprise if their unrest spread civil strife in the future, or if such strife barred conservation progress.

continued, over



Metering Unknown Quantities

Graphic 'meters' in each section of the report offer pointers to the present situation in tropical forest conservation, compared to the state of affairs five years ago, when the *World Conservation Strategy* was published. Each rating is based on a cross-section of information from IUCN's network filed at Gland over that period. Each is therefore a subjective but informed guess at likely trends in today's struggle to conserve tropical forests.



Guarded optimism

It would be wrong, then, to claim that prospects for tropical forest conservation have improved all round. Yet we can see several trends emerging that give real cause for optimism.

It is hard to believe that, just ten years ago, awareness of tropical forest problems as problems was limited to a small and very worried group of specialists and lobbyists. And their stock response when asked to suggest solutions was almost always: "We need more facts!". One of the earlier key documents to seriously address the issue, itself prompted by IUCN, was a contribution to *Unasylva* by Adrian Sommer in 1976.

Awareness of tropical forest issues is constantly growing. It is giving rise to more and more ambitious and positive courses of action in tropical countries, in onlooker countries and internationally — though there are still far more ideas and reports than decisive acts on record. Investments in planning and training made since the late 1970s are beginning to pay dividends here and there: the forest sector plans for Zambia in her National Conservation Strategy (see the Geoscope section of this issue) are a good example. And many people whose heritage it is to live and work in the tropical forests are beginning to organise themselves into effective lobbies to guard that heritage.

This *Bulletin* report casts a wary eye on these trends. Adapting the famous axiom that politics is 'the art of the possible', we look for evidence of the art of the *impossible* at work in tropical forest conservation.

Total loss or total rescue of *all* remaining unlogged or unconverted tropical forests — both are equally impossible under today's circumstances, and nobody can afford to ignore this fact. A steady state *will* be achieved. But when? And when it happens will it add up to a disaster or to a feasible basis for long-term conservation?

Ends justify means?

It is one thing to sit in comfort and argue that everyone's survival depends on keeping tropical forests intact. But this kind of ideology cannot be expected to mean much to the average farm, road or sawmill labourer in the tropics, whose survival may well depend on deforestation. Nor should it be sanctimoniously urged on their political leaders, whose main and legitimate concern may be to find export income to buy vaccines, irrigation pumps or schoolbooks.

If any of these groups adopt a more conservation-conscious approach they will usually do so in response *not* to vague theorems like the greenhouse effect but to market forces and political expediency, the same familiar sticks and carrots that reinforce major reforms of any kind the world over.

In places like Europe, North America and Australasia theoretical arguments may seem to operate with greater force. Yet awareness is no substitute for achievement. In most high-income temperate countries,



we find remarkable public sensitivity to the problems of rainforest ecosystems in faraway countries.

But even the best-informed public is easily bored if nobody offers workable prescriptions for putting things right. Unless very clear targets for outside support materialise, such remote issues soon become over-intellectualised or simply forgotten when the next, more spectacular, natural disaster hits the headlines.

Visible action

Thus it is important, while pressing for measured, long-range policies, to have courses of practical conservation action ready which can put outside support to optimum, immediate and visible use. Such action may, to the purist, sometimes seem simplistic or premature but counsels of perfection are a luxury the tropical forest cannot afford.

Some unconventional means and unexpected allies are entering the picture as the Union's tropical forest conservation efforts develop: examples are offered in this feature but they are only a small,

deliberately randomised selection from a large pattern of activities that changes almost daily.

The 'impossible' dream of conserving at least a majority of the world's remaining unconverted tropical forests by the end of this century can come true. But not if more careful analysis or more careful spending are all we can rely on to do the trick. And certainly not if the governmental sector — or any sector — claims a monopoly on responsibility for solving the problem. Newer, more inventive approaches should be encouraged to add their yeast to an established mix of ways and means that has so far shown definite progress — but progress still too slow to overtake catastrophe. □

IUCN Director General KENTON R. MILLER has specialised in forest and protected areas management and planning, working most of his career in tropical countries for FAO, UNEP, Unesco, the World Bank and other international organisations. He has also served as a Professor of Natural Resources at the University of Michigan, USA.

STRETCHING DEFINITIONS

IUCN's definition of a tropical forest for its conservation programme needs to be broader and more pragmatic than stock concepts allow. DUNCAN POORE explains.

THE TERM tropical forest includes a wide range of forest types; most generalisations about problems break down in the face of this variety. For example, in tropical regions where too much logging is a problem there is rarely a fuelwood problem. IUCN's policies seek to face up to such differences.

They define tropical forests very widely, to include forests of all regions in the tropics and sub-tropics that are free of regular frost and which have a dry season of no longer than six months. Tropical islands and potentially forested areas of tropical mountains also come within the scope of the Union's tropical forest conservation programme. Forested areas of mountain chains such as the Himalayas, which extend beyond or adjoin tropical regions, are also included.

The problems are not limited just to areas under forest cover. Some ecosystems on degraded forest land may be worth preserving in their own right, others could and should recover to forest. The problems of deforestation often originate outside the forest — in agricultural expansion schemes, for example — or (as in China, India and Peru) in priorities determined outside the tropical zone. So policies for tropical forest conservation should first be concerned with the forest itself but next with land use around the forest and the various outside factors influencing it.

In the last analysis land, resources and people will reach a balance: sustainable use. They may reach this equilibrium in a planned, humane manner such that rich resources remain perpetually at our disposal, or by a series of cataclysmic plunges that cause untold hardship and leave an impoverished world. The conservation community is committed to the first path.

A moving target

The main goal of the *World Conservation Strategy* is to bring about development (where development is needed) with conservation. But while the main goal of conservation is stable balance, most development is dedicated to rapid change.

Two of the *Strategy*'s three top priorities are to maintain essential ecological processes and to preserve genetic resources. The best way of accomplishing these objectives in tropical forests would be to maintain large areas of natural ecosystems un-

touched and unpeopled. Soils would remain intact; rivers would behave themselves. Waters would be clear, wildlife thriving in naturally balanced numbers. Technology would be redundant.

But such a course of action is no longer a realistic possibility anywhere. Hence the third objective of the *Strategy* is a moving target: to ensure the sustainable use of species and ecosystems.

Intensity counts

The word 'sustainable' is itself wide open to interpretation. Both the natural forest itself or any artificial ecosystem replacing it can be exploited sustainably in many ways and at different levels of intensity. The level depends on the amount of energy and skill that are invested there.

The more capital intensive forms of management usually also carry their own cost — in higher use of energy, increased risks of pollution and so on. We must use all these alternative ways of managing natural resources if even the basic need of growing populations in tropical countries are to be satisfied. Further intensification cannot be avoided if the quality of life of these people is to be raised.

Balance

Tropical forest conservation must therefore be concerned, first and foremost, with finding an acceptable balance between different intensities of use.

There are many obstacles to achieving this balance. Central, perhaps, is a lack of understanding that the intact forest and its soils are a capital resource. This is reflected in the plundering of this capital and a failure to invest in its protection and maintenance. But there are many others: political pressures, social unrest, considerations of national security; failure to treat land use questions in a manner that is integrated and socially sensitive; and a lack of trained staff and the knowledge that can be derived by well-conceived research.

Once ecosystems are managed they are changed. As intensity increases, so does the probability of irreversible change. Populations of plants and animals are affected first, then whole ecosystems go, then soil. So conservation is not only concerned with the balance between different kinds of use but also with the way in which one use is changed into another, and with the standards of management at all levels of intensity.

If conservation is to last, it must be economically viable and socially acceptable at national and local levels. We have to work towards the ideal step by practicable step, starting out from the real situation in which tropical forest countries find themselves today. The ideal may always remain elusive...

A Union Programme

Forests originally covered virtually all of the land in the tropics and tropical forests contain most of the world's biological diversity. They constitute a potentially renewable natural resource that at present is subject to greater abuse and mismanagement than any other key global resource.

All of IUCN's Commissions, its Centres and many of its members are actively involved in tropical forest conservation and management. The government of Sweden has given IUCN a grant to enable an office in the Secretariat to blend all these activities into a comprehensive Tropical Forest Conservation Programme. The programme increases the flow of information between different parts of the Union network on tropical forest matters. Thanks to this exchange of information, the Secretariat can represent the views of the Union at international gatherings where tropical forest issues are discussed and policies are formed.

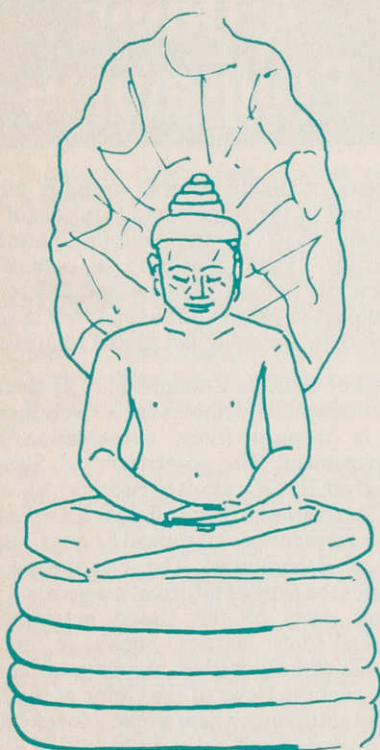
IUCN, through its Tropical Forest Programme Office, has contributed to the *FAO Tropical Forest Action Plan* and is in routine contact with FAO where implementation of this plan is concerned. We have also made a major contribution to the *Call for Action* prepared by the World Resources Institute. For these inputs, we drew heavily on the resources of the Conservation Monitoring Centre, the Action Plans of the Commission, on National Parks and Protected Areas and the Species Survival Commission and the combined expertise of the Union's Secretariat and member network.

Priority aims of the IUCN programme are:

- ☐ improving protected areas systems to shield more tropical forest sites more systematically
- ☐ encouraging conservation-conscious land use in areas adjacent to parks and reserves
- ☐ promoting sustainable utilisation of natural forests, in tune with conservation of biological diversity and genetic resources
- ☐ urging re-establishment of natural vegetation in degraded areas, where feasible and desirable
- ☐ constructing regional networks of tropical forest research and management institutes
- ☐ applying IUCN databases to urgent tropical forest problems.

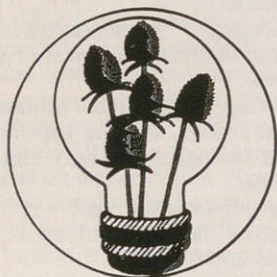
This report enables some of the specialists who are closely involved with the programme to present personal views on today's tropical forest issues. It also looks beyond the horizon of the Union programme at overall trends and at new initiatives in the field now emerging from unexpected or previously obscure sources.

Another definition



The Forest
... a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance and extends generously the products of its life activity; it affords protection to all beings, offering shade even to the axeman who destroys it.

The Buddha

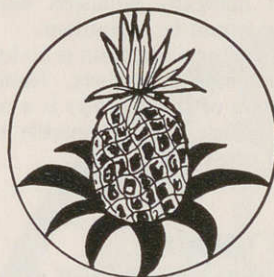


Protection

The natural forest is a bank of land and of resources the loss of which would be irreversible. Certain areas should be permanently dedicated to protective uses. All land should be kept under forest until it is essential that it is used for other purposes. If available, areas which are not under forest should be chosen first for more intensive land use.

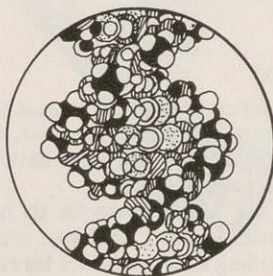
The Ideal

Imagine a country with almost all its forest intact but which needs economic development to meet the normal requirements of a gradually increasing population. What should be the main elements of the ideal forest policy?



Land for food

Once protected area requirements have been met, agriculture needs the best and most robust soils available, with priority given to users who presently have no alternative to overusing and degrading the land on which they live. Combinations of food and tree crops should be used which retain the protective characteristics of the forest structure. Agricultural efficiency is important to minimise pressure on other areas.



Genetic resources

Special measures need to be taken to preserve the infra-specific variation of species of economic importance. These would include protecting some areas specially for this purpose and applying management constraints in chosen areas elsewhere.



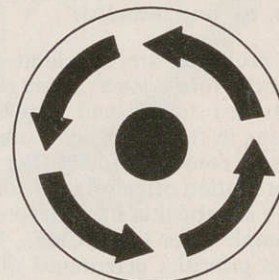
Living room for people

Areas inhabited by indigenous people whose habits and customs pose no threat to ecosystem stability should be protected for their continued use.



Preserving fragile soils

All areas with fragile soils should be mapped to allow rational management. In particularly fragile areas there should be a permanent ban on exploitation. In others areas no development should be permitted unless this could be carried out, and later managed, without soil deterioration.



Samples of ecosystems

Representative samples of widespread ecosystems (climax, sub-climax and extra-zonal) and examples of exceptional ecosystems should be preserved.



A full range of species

Areas of exceptional richness or unusual character need extra protection. The feeding, roosting and nesting sites of migratory birds and sufficient territory to encompass full populations of wide ranging mammals and birds should be covered.

Forests for sustainable production

An area large enough for the production of foreseeable requirements of domestic timber, wood and secondary forest products should be allocated. If available, further areas should be set aside to satisfy export markets. Any shortfall should be made up by intensively managed, highly productive plantations on stable soils.

Other environmental safeguards

Environmental safeguards should cover any major developments, such as large reservoirs, irrigation systems, urban settlements, communications and so on, to ensure that they harmonise with environmental requirements.

International backing

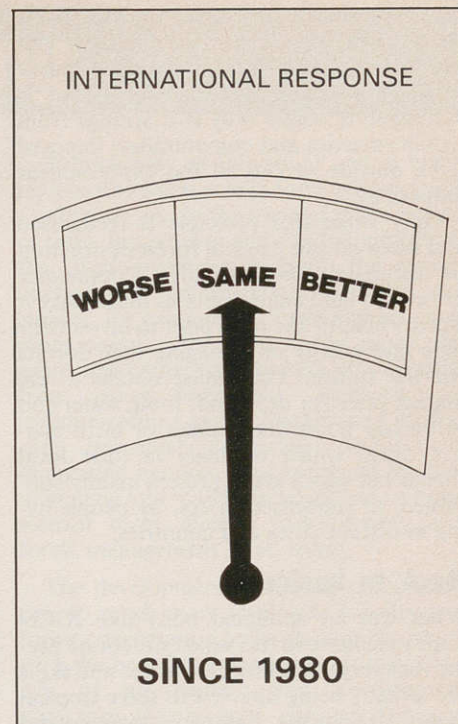
Good land use planning and proper sustainable use can become very difficult

unless there are international policies which encourage them, or at least do not positively discourage them. International markets and policies can very readily encourage unwise decisions about land use.

National will

Management of natural resources is the responsibility of each nation. Each nation should look upon these resources in the total context of its economic and social development, present conditions, predicted trends, and national objectives. An acceptable balance for the conservation and use of its tropical forest lands must be devised. □

Duncan Poore directs the Tropical Forest Programme of the International Institute for Environment and Development. He has close links with IUCN through the Commission on Ecology and in many other connections. Previously Director of the Commonwealth Forestry Institute, UK, he is an ecologist with a lifetime's experience in tropical forests, mainly in southeast Asia.



BLENDING GLOBAL EFFORTS

Promise in Paris

In February 1986, President Mitterrand of France invited twelve heads of state and 50 ministers representing 67 countries to an international forestry conference in Paris. JEFFREY SAYER discusses the wider significance of the event.

THE PARIS tropical forest summit marked the first time ever that the subject had won the attention of so prestigious a political gathering. Perhaps it was of even greater significance than the *FAO Tropical Forest Action Plan* and its relative, the *World Resources Institute Call for Action*.

The 'establishment' response to the critical threat to tropical forests, as it is embodied in these two plans, is that development assistance aid to the forestry sector should be doubled. At present this aid makes up only one percent of all aid given by the OECD countries to the developing world. Is simply increasing this to two percent really an adequate response to the gravity of the situation? And is it really just a problem for foresters?

With the Mitterrand summit it seems that at last realisation may be dawning that the consequences of tropical forest destruction extend far beyond the forestry sector and that the answers must be political as well as technological.

IUCN's message to the meeting was this: What is happening to tropical forests is symptomatic of the way in which development assistance is failing to achieve the vital goal of promoting sustainable long-term use of the natural resources of low-income countries.

There are exceptions, among them the work of the development agencies of Sweden and Canada, which have always backed IUCN's collective approach to this goal: the implementation of the *World Conservation Strategy*. Sweden has played



a particularly prominent role in supporting the Union's work in tropical forest conservation.

Where does aid go?

But aid in general has a habit of fostering inconsequential bureaucracies in developed and developing regions alike. Such bureaucracies often draw talented and educated achievers out of the fields where real management decisions are made. In low-income countries, they can inhibit small-scale local initiatives and distort patterns of consumption. A frequent result is unbalanced economic development which undermines the resource base on which sustained long-term development depends.

Tropical forests represent a massive foundation for ecological stability, the primary resource upon which we have always depended for survival and always

will. Deforestation has already vastly weakened this stability and could put an end to its most solid cornerstone within our lifetime.

Political decisions are required to stop this from happening. These decisions may be unpopular with many aid donors and aid recipients and with many of the prosperous and educated city-dwellers who form the powerbase of most political leaders in the tropics and elsewhere. Inertia and enormous vested interests combine to maintain existing aid patterns. Hopefully the Mitterrand summit saw the beginnings of political realisation of this situation.

A better way?

Sensitive development assistance does have a role to play. It can give rise to major improvements. Yet aid must go to people and not to governments. Perhaps the most notable feature of the Mitterrand summit was the view, constantly expressed by delegates from every region, that aid must more closely match the needs of poor rural people who are its primary target. Several delegates spoke of micro-projects, of projects operating at the grassroots level and of the role of NGOs in this process.

We are beginning to understand more about how aid can be most fittingly applied and the style of aid programme management is gradually evolving along these lines.

Aid not enough

But aid — in any quantity — is only part of the picture. More significant are the attitudes and policies of governments towards such fundamental issues as commodity prices and land tenure. Tropical forests and other tropical ecosystems will only be truly secure when the people who make a living from them are able to sustainably produce more food and other goods than they themselves need — *without* expanding the areas that they cultivate.

If there is one issue that stands out from the crowd, it is the need to delegate most of

the responsibility for resource management decisions to the people who live on and with the resource itself. Natural resource conservation, like civil law and order, is permanently viable only if it springs from *within* societies and communities; imposed from outside, it can all too easily appear antisocial.

Only when this principle is recognised and acted on can tropical forest destruction be ultimately headed off. Commodity prices and land tenure systems must make it worthwhile for the rural poor to invest their time and energy in managing their forests for the future. They must obtain a real market price for the wood, food, water and secondary goods like rubber or birth control drugs which originate in their local forests but which are at present mainly consumed, at subsidised prices, by people living in distant cities and countries.

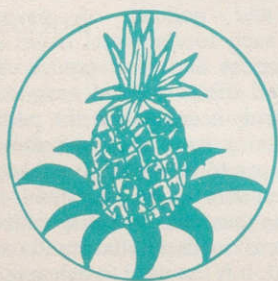
Back to basics

What can an apolitical body like IUCN hope to achieve in this vexed situation? Seeing that very substantial resources and skills are already being directed to solve tropical forest problems along 'mainstream' development channels, the Union's best course is surely to concentrate on those things which it knows how to do best and which can be done without long delay. IUCN's own role is twofold: at the policy level we can and must provide a pivot that can be steadily used by all our members to exert leverage on the economic, social and political activities that influence all aspects of tropical forest conservation. The work of our Commissions and Centres is central to our ability to monitor events and exert influence.

But IUCN's best track record lies in the fields of genetic resource conservation (through species protection), environmental planning and legislation and the design and management of protected areas, activities that often come low on the shopping list of development's big spenders.

At the level of practical interventions, the Programme will be very much based on promoting an adequate and irreducible system of protected areas in tropical forest regions. These must be tuned to the biotic and economic realities of the locality. The key problems for protected areas often lie in the use of the land surrounding them. To the extent that sustainable forest management and agroforestry are needed to stabilise the use of these lands, we must become involved in these complex issues. If we do not set this work in motion, nobody else will. □

Jeffrey Sayer is an ecologist with wide experience of conservation projects in Africa and Asia. He now steers IUCN's Tropical Forest Conservation Programme.



FAO Raises Level of Debate

1985 SAW the first time ever that a major UN agency, the Food and Agriculture Organization, singled out forests as the theme for intensive system-wide and worldwide efforts to: "catalyse events and bring forestry issues from the back to the front page of global awareness." That's how Richard Pardo sums up FAO's International Year of the Forest and its achievements. It is part of his job to satisfy the information appetite the theme year has created.

Though IYF's brief was not limited to tropical forest issues, one of its most conspicuous products was the UN *Tropical Forest Action Plan*, a five-point framework for orchestrated action on:

- ☐ forests and land use
- ☐ forest-based industries
- ☐ easements for ecosystem conservation
- ☐ fuelwood and energy
- ☐ institution-building for resource management needs

FAO sees the Plan as one among many compatible tools for improving the management prospects of tropical forests. It sprang from five programmes developed after a 1983 meeting of the FAO Committee for Forest Development in the Tropics. The meeting called for more prescriptions and less lofty diagnosis in the international community's approach to tropical forest problems. A steering group later merged the five programmes into a draft Action Plan which was endorsed in Mexico at the World Forestry Congress in last July and released in November at The Hague, Netherlands.

At the Netherlands meeting, 39 representatives of 32 development assistance donor organisations or agencies accepted the plan as the baseline for coordinating their tropical forest policies. Thus the World Resources Institute's *Call for Action* on tropical forests, IUCN's Tropical Forest Conservation Programme and several other important agendas for international action are all compatible with the Action Plan though their viewpoints may differ.

Countdown

"This degree of coordination has come remarkably swiftly," says Pardo, "compared to the time it usually takes international bodies to agree on priorities."

In his view, things began moving in 1978 with the *Forests for People* theme of the 8th World Forestry Congress (Djakarta),

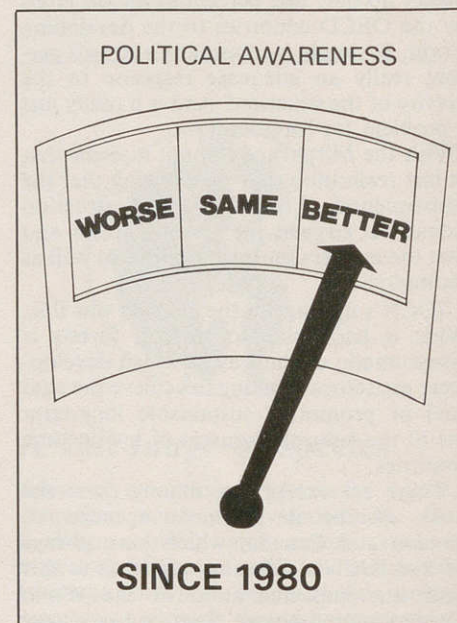


for which FAO provided technical support. Then there was the World Bank's Forestry Policy Statement in the same year, involving people like ex-FAO official John Spears and eloquently enunciated by Eckholm and Myers. That helped fuel subsequent documents like FAO's 1980 Forest Strategy for the Decade, which called for a shift of policy emphasis towards the integration of forestry with the whole rural development picture. Together with the 1979 Rome World Conference on Agrarian Reform and Rural Development, which established rural poverty as the main target for development activities, all the basic elements for a coherent international policy were in place.

A cynic might be tempted to suggest that one of the main reasons why such close harmony has been achieved so swiftly might be the small 'coven' of experts who tend to crop up on most international statutory bodies charged with examining tropical forest problems.

But Pardo feels there is more behind events than just casting. He points to developments that strike boldly away from the beaten track, such as the Indonesia Review (see page 34 of this report) and the International Tropical Timber Agreement. "They show a definite movement in favour of long-term resource management and a willingness to try new approaches that would have been very hard to get off the ground ten years ago," he concludes. □

For a full text of the FAO Tropical Forest Action Plan, contact the Distribution and Sales Section, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.



Priorities Emerging

Many good schemes have been proposed to head off the global threat posed by deforestation in the tropics. But tangible results are few. Here and there, experiments and projects have succeeded on a local scale but till now no orchestrated international effort has developed, says BILL BURLEY.

Two recent international initiatives give us reasons to be hopeful that the world community will, at last, take the deforestation crisis seriously and begin working in more coordinated fashion to solve the problem.

The Committee on Forest Development in the Tropics of the UN Food and Agriculture Organization (FAO) released last November a *Tropical Forestry Action Plan* that will serve FAO and other agencies as a guide to the technical assistance needs of many tropical developing countries to build forestry institutions and to develop, manage, and conserve forest resources.

In tune with the FAO plan, a major report *Tropical Forests: A Call for Action*, was released at about the same time by the World Resources Institute, The World Bank, and the United Nations Development Programme. This document, which has received a lot of press attention, contains recommendations for action over the next five years in developing countries with critical forest resource problems.

Reason to hope

There is good reason to hope that this recent flurry of activity and interest in tropical forests is stimulating actions by the development assistance community and developing countries that are needed over the next few years if we are to avoid serious environmental disruptions.

The WRI report was developed by a task force of nine world leaders in forestry, land use, and natural resource planning. Five major areas were examined: fuelwood and agroforestry; industrial or commercial forestry; watershed rehabilitation and protection of upland watersheds; conservation of tropical forest ecosystems; and strengthening of institutions. As well as recommendations in these five areas, the three-volume report contains recommendations for specific actions in 56 developing countries. Many of these recommendations derive from successful experiences elsewhere, and the report also contains 39 case studies of forest management and conservation activities that could be put in use much more widely in the tropics.

The task force recommended a five-year programme that would cost approximately US\$8 billion. Half of this funding would come from the development assistance community, including the multilateral banks such as The World Bank and the bilateral agencies such as USAID or Japan's bilateral development agency.

What needs to be done

Clearly, developing country governments must take the lead in slowing deforestation

and in managing their own forest resources more sustainably. For example, we need greatly accelerated land reform programmes and expanded employment opportunities to provide landless people with alternatives to forest destruction. There must be greater political commitment to channel future agricultural settlement into nonforest areas and into already deforested areas suitable for agriculture.

For the 250 million people already living within tropical moist forests we need to develop more intensive and efficient agricultural methods and to establish sustainable farming systems that do not destroy the forest. Governments need to change their fiscal policies outside the forestry sector (such as subsidies for large-scale cattle ranching) that encourage exploitation, depletion, or waste of forest resources to a greater extent than could be economically justified or commercially profitable without government intervention.

The role and *modus operandi* of foresters needs to be changed, especially to place more emphasis on local and community forestry and extension work. In the past, there has been too much emphasis on commercial forestry and the development of forest industries to increase exports. Foresters need to work more closely with agricultural technicians, planners, and energy specialists; forestry has been narrowly defined for far too long.

Local action

Ultimately local participation determines success of forest projects. The millions of small farmers and landless people who use the forests daily must be brought more directly into the management and planning of forests.

This is especially true near parks and protected areas, where in some cases, the only way that the conservation unit will persist is by directly involving the local people in its management and sustainable exploitation. Non-governmental organisations (NGOs) already are playing a vital role in this, but their influence and involvement must be increased substantially. This is true for international NGOs as well as smaller, more local NGOs.

Governments can help speed this process by establishing policies and incentives that encourage local participation in rural tree planting programmes and natural forest management, for example. Forestry codes and laws affecting land and tree tenure; prices for poles, fuelwood, fruit, and other forest products; and the cost and availability of seeds and seedlings need to be reassessed as potential incentives to local participation.

Women play an important and in many regions dominant role in food and livestock production and in the use and management of trees. But women and children often suffer disproportionately from the consequences of deforestation. In the dry tropics, for example, as fuelwood becomes more scarce, they must spend more and more time gathering it and are thus diverted from other household, childcare, or revenue-earning tasks. The forestry profession in most countries, traditionally dominated by men, must recognise the role of women and make special efforts to bring women more directly into forestry and forest management at all levels.

The development assistance community can do much more to elevate forestry and forest conservation to levels commensurate with the benefits to humankind. Less than 5% of all lending and development assistance grants now goes to forestry; often the amount is closer to one percent. However, the developing countries themselves must also give higher priority to forestry and must commit themselves to additional loans from the multilateral banks or must seek more grants for forestry from the bilateral agencies.

Signs of change

Despite the grim prognosis for tropical forests and the lack of commitment by development assistance agencies and many developing country governments, there are recent signs of change in this situation. The WRI report and the FAO Action Plan together are stimulating some nations and agencies to reassess their commitment to forestry and to determine steps that can be taken soon to stem deforestation. A November 1985 meeting of development assistance agencies in The Hague, for example, resulted in major new steps toward interagency collaboration, and the agencies working together will be coordinating their assistance to national forestry sector reviews in a dozen countries in 1986.

The World Bank recently re-evaluated its forestry lending programme for Africa and made numerous changes, as recommended in the WRI report. The Netherlands Government has stated that it will double its development assistance to forestry over the next two years — a symbolic yet significant step. The US Agency for International Development is re-evaluating its assistance to tropical forestry and biological diversity conservation in general, as a result of the WRI report and the strong pressure put on the agency and the US Congress by US NGOs.

European and North American NGOs are launching campaigns to halt deforestation. NGOs from developing countries are increasingly involved in this global effort because some traditional development assistance methods and projects simply have not worked or, worse, have resulted in increased deforestation in countries such as Indonesia and Brazil.

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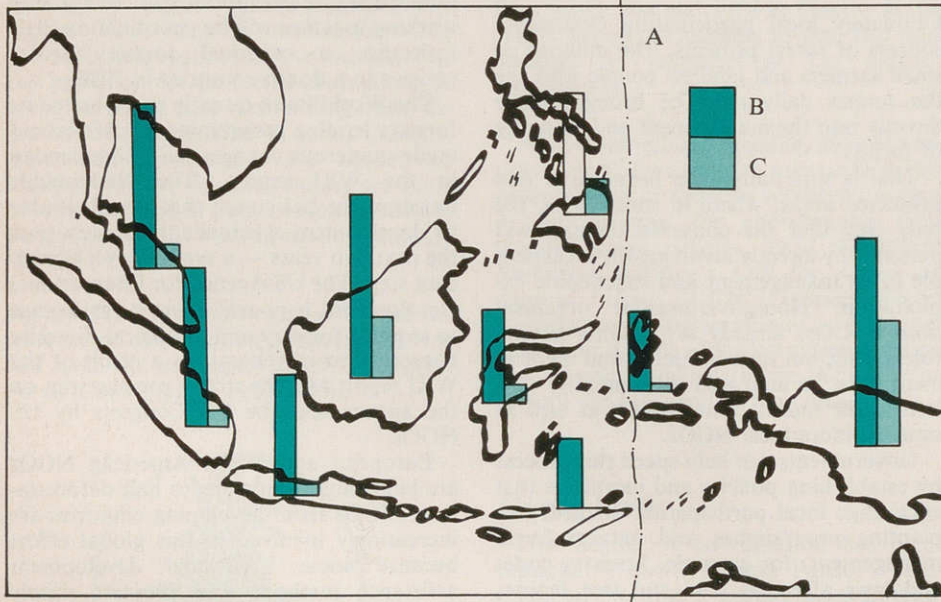
Is it enough?

These trends make us hopeful that the next few years will see major new commitments to solving the deforestation crisis. The haunting thought, however, is whether these actions taken together will be enough. One must look at both successes and failures in forestry and conservation projects: looking at only one or the other makes one naïvely optimistic or unproductively pessimistic.

IUCN and other major conservation organisations have an essential role to play in several ways. In addition to helping carry out specific conservation projects in various countries, they can mobilise expertise and data useful to developing country governments and to the development assistance community. For example, good information on critical tropical forest ecosystems needs to be used by the development agencies in project planning, to avoid environmental disasters and to help conserve tropical ecosystems.

WRI, IUCN, and IIED already are working together to see that this information is used more widely in some agencies such as the World Bank; but at the same time, local conservation organisations and conservation data centres should be ensuring that ecological information is used by the natural resources agency in the country involved. □

F. William Burley is a policy analyst who worked for several years on the conservation programme of the US Nature Conservancy in Latin America. He now directs the Forestry Programme of the Washington-based World Resources Institute.



System reviews can provide an overview of conservation factors such as species richness (B, above) and levels of endemism (C) for an entire realm, in this case the Indo-Malayan. Line A shows the realm's eastern limit.

PROTECTION

REALM REVIEWS new tool for protection planning

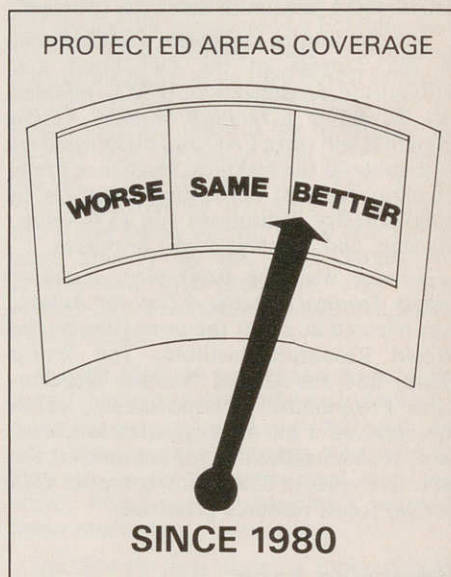
Decisive steps are being taken by IUCN to help improve the protected area systems of the world's major biogeographical realms. KATHY MacKINNON describes the first fruits of this initiative: system reviews for the Afrotropical and Indo-Malayan Realms.

THE NEXT ten years will be crucial for the establishment of more protected areas. After that it may well be too late: there may be no large, undisturbed tracts of most habitats left from which to choose. Two reviews to be published by IUCN in 1986 examine the existing protected area systems of two key regions and identify priority targets for international involvement, co-operation and support.

The reviews are collaborative projects between UNEP and the Commission on National Parks and Protected Areas (CNPPA) of IUCN. They, and others which will follow, will be available to help steer protected area planning and management in the important years to come.

Regional thinking

Many reserves were originally established *ad hoc* to protect a rare species or to set aside areas rich in big game. During the past 15 years many nations have made determined efforts to protect a complete range of habitats selected more systematically and by reference to ecological criteria. But they have rarely considered how their own system might fit in a regional framework.



If each existing national system was perfectly adequate, the picture for the realm as a whole would already be nearly complete. However, most nations have a long way to go before they achieve perfection. Besides, if only national importance is considered, many areas of regional significance may not get the attention they deserve.

For instance, a country may propose to establish six reserves, one of which is a mangrove swamp. If this mangrove swamp is the only example of this habitat protected within the whole realm, its conservation importance becomes a far higher priority than it would seem in a purely national context.

Similarly, an ecosystem rare and threatened in one country but common and well protected in another country nearby is not a matter of top priority on a more than national scale. IUCN, the main international agency offering support and advice on national parks and protected areas, needs this sort of information to help identify areas of priority for international assistance.

The reviews

A lasting goal of IUCN and many other international organisations is to establish a global system of protected areas to protect the fullest available range of biological diversity in the forms of ecosystems, species and genomes. The concept of biogeographic provinces has therefore been used as the basis of the IUCN reviews, which are intended to assess the adequacy of the reserve system and identify gaps and shortcomings.

Existing reserve systems are considered in terms of their status, boundaries, design and effectiveness. Where protection is inadequate priorities are identified for augmenting it and — where possible and appropriate — extensions of reserve areas are recommended. Critical areas *outside* protected areas in need of conservation are also identified and sites for additional protected areas are suggested.

Sources

This task is ambitious but much of the groundwork has already been done. Data has been gathered at the Protected Areas Data Unit in the Conservation Monitoring Centre of IUCN; information on threatened birds has been contributed by ICBP. We have also consulted the various Specialist Groups of IUCN's Species Survival Commission for their view of conservation priorities in the two realms and we have received much valuable advice and information from parks managers.

The first job was to choose suitable biogeographical units to frame the review findings. The Afrotropical review is based on White's vegetation map of Africa published in 1983 by Unesco, while the major units of Udvardy were used (with some revisions and new sub-divisions) for the Indo-Malayan Realm.

For each vegetation type within these classifications we have mapped and estimated the original and remaining range; we show how much is currently under protection and (using satellite imagery, conventional maps and ground truth about present patterns of land use) we estimate the rate of forest loss and the degree of threat present. Ideally, we should hope to find at least 10% of each habitat type within the reserve system of each realm.

Areas of high local endemism and high species richness have been identified from species distribution data and site-specific survey reports. Plant sites of particular importance have been identified by the Threatened Plants Unit of CMC. Protection of individual species has been assessed with reference to threatened species mentioned in the Red Data Books and to conspicuous indicator species from well-known animal groups. For Madagascar we have looked (for instance) at lemurs and endemic birds.

Ecological islands

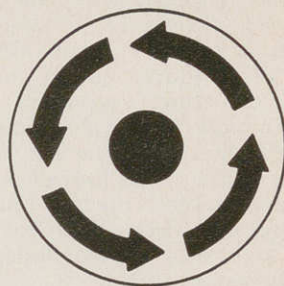
Increasingly, reserves will become 'islands' in a sea of farmland. So it is important that they are as large and well-managed as possible, to help reduce species loss. Many national systems appear adequate on paper yet have no real protection in fact. So we have given every protected area a conservation score which increases according to the completeness of its management.

The reviews will finally offer a list of recommendations for each country; suggestions for new protected areas, extensions to existing reserves, better management, more training, anti-poaching units and so on according to need. They will be a genuinely useful tool for future planning and management of protected areas. □

Kathy MacKinnon is a zoologist and ecologist who has worked for many years in the tropics, mainly in Indonesia, and written extensively on tropical forest biology.

Sizing the Safety Factor

How small an area of rainforest is ultimately necessary to support natural communities with their characteristic variety of plant and animal life? TOM LOVEJOY describes an exciting WWF project that is now coming up with firm answers to this question.



WHAT HAPPENS to species and ecosystems when patches of forest are isolated? The Minimum Critical Size of Ecosystems project has been running in the Brazilian Amazon for seven years and is beginning to supply the facts. But it may be decades and perhaps centuries before many of the changes in larger reserves will take place. Brazil formally recognised the long-term importance of this work on 5 November last year, when President José Sarney gave legal protection to the project's reserves under the authority of Brazil's National Environment Law.

The fragmentation of once continuous wildlands is a growing problem and has serious implications for conservation. After isolation, forest fragments are unable to support the full array of plant and animal species previously found in them. Isolated patches lose species over time, ultimately losing nearly all of them.

The forces driving the species loss process are little known. Nor is it known whether or not there is order in species loss and if so, how much. This in turn bears on which species can be expected to persist in different sizes of forest fragments. Clearly, this topic is of major relevance to conservation: most reserves and parks are isolated fragments of once larger wilderness areas, or are likely to become so. There exists little basis for assessing whether many protected areas will, in the end, conserve the very species for which they were set aside. This topic is fundamental to conservation agencies such as WWF if they are to know how well funds are expended on establishment and management of protected areas.

Looking for answers

The Minimum Critical Size of Ecosystems project (MCS), a joint effort of WWF-US and Brazil's INPA (*Instituto Nacional de Pesquisa da Amazonia*), and also sponsored by Brazil's FBCN (*Fundação Brasileira para a Conservação da Natureza*), is generating data to answer these questions. It aims to identify the minimum area of rain forest that will support intact natural communities and simultaneously to analyse the species composition and ecological dynamics of isolated patches of rain forest.

The MCS location, 80 km north of Manaus in the Brazilian Amazon, is highly significant in view of the importance of the tropics both for science and human welfare, and the critical need for properly designed and managed natural reserves.

The project is within the Agricultural Zone of the Economic Free Zone Authority of Manaus (SUFRAMA) and takes advantage of a requirement that 50 percent of any development project in the Amazon must remain in forest. At the request of SUFRAMA three cattle ranches are collaborating with the project by arranging the geometry of their forest clearing so the required remaining forest includes a size series of patches. Project scientists mark out these areas and study them in their primeval state before isolation takes place and then afterwards.

Edge ecosystems

The study is planned for a period of at least twenty years and is in its seventh year. Of 24 forest research reserves, 22 are under active study, 10 have been isolated and two have not been demarcated in as yet continuous forest.

Two reserves, one of one hectare and one of ten hectares were isolated in 1980. Major insights it has made possible included evidence of three effects, all related to the newly created edge:

- an influx of birds into the reserves occurred when the surrounding forest was destroyed, also an invasion of butterflies characteristic of secondary succession vegetation, hundreds of metres into the isolated reserves;
- there were gross changes in the woody plant community probably occasioned by changes in temperature and relative humidity;
- species loss due to insufficient area was noted.

Within months, neither of these two tiny reserves was in any sense representative of Amazon forest ecosystems. In 1983, five more reserves were isolated, two each of one hectare and ten hectares, and one of 100 hectares. These reserves confirm many of the patterns observed in the first two isolated. Furthermore, observations have promoted much attention to edge effects occasioned by the abrupt creation of a reserve margin by deforestation.

Dramatic changes

Changes at the reserve edge are characterised by a biotic change (temperature, relative humidity, light, and exposure to wind). Among the first order biological responses to these changes are elevated tree mortality, leaf fall, a flourish of new plant

growth in response to increased light, and bird populations depressed both in numbers of individuals and species for tens of metres into the forest.

The second order biological responses include insects responding to plant growth: documented already is disturbance of forest interior butterfly communities by the invasion of light-loving species characteristic of second growth vegetation.

A third order biological response that might be expected (but has not yet been observed) would be an increase in insect species and possible changes caused by mobile organisms fleeing destroyed habitat or by a seed rain of animal-dispersed second growth plant species.

Edge effects observed on the border of different habitats in temperate regions often include increased species richness relative to either habitat. Nonetheless, initial results at the MCS project suggest the reverse with species impoverishment being evident at least for neotropical forest birds.

Buffer zones needed

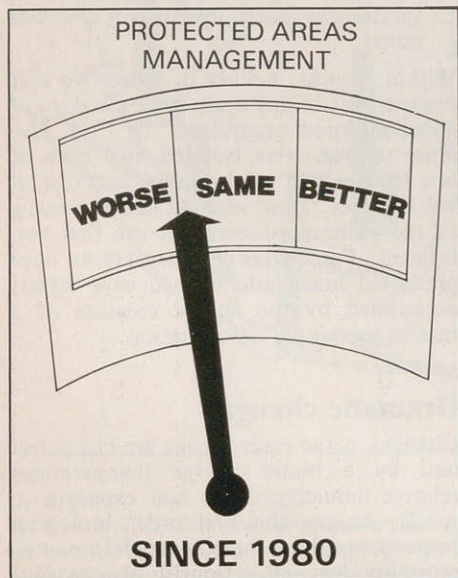
Edge effects encountered at MCS suggest that larger reserves will be needed. Vast buffer zones in the hundreds of metres (200-300 metres deep) will be required to protect the core reserve from changes. Area effects could also have a cascading sequential impact.

Loss of a pollinator or primary disperser or over-exploitation of food resources by a confined species could lead to second order biological changes in pollination or seed dispersal biology with implications for other species.

Long-term changes

Many questions remain and with the recent protection of reserves it will now be possible to study long-term changes for many decades. Corridors connecting fragments to continuous forest have shown real value for ant-following birds and will be studied further. Species area requirements and edge effects will continue to receive much attention from research personnel. Close observation of species adjustment to forest fragmentation and the subsequent changes in ecological conditions will be maintained. And further species vulnerability to forest fragmentation, such as the vulnerability of small populations to random fluctuations and genetic problems will be looked at more closely in the coming years. □

Thomas E. Lovejoy, Director of Programs for World Wildlife Fund in the United States, is a tropical ecologist well known for his work on the biodynamics of forest fragments in Amazonia.



Protected areas must be buffered from the spreading influence of settlements like this one in Amazonia. Photo: J.V. Puttkamer.



How Much is Protected?

How much tropical rainforest is conserved in protected areas, and what fraction of the whole biome enjoys protection?

JERRY HARRISON
of IUCN's

Conservation Monitoring Centre

sums up the state of statistical knowledge.

We are not yet in a position to say where all the remaining tropical forest is and what area it covers, still less to judge the viability and quality of that forest, or its degree of vulnerability or protection.

What we can do now, however, is analyse protected area coverage using biogeography, the science of distribution of species and ecosystems. In 1975 Miklos Udvardy prepared a biogeographical map of the world, based on the earlier work of Ray Dasmann, which was primarily intended as a tool for assessing protected area coverage.

Udvardy divided the world into 193 biogeographical provinces in eight major realms. Each province is characterised by one of fourteen biome types; the tropical humid forest biome is found in 18 of his provinces. The next question is: how many areas (and of what size) are to be found within these provinces on the map?

Protection is not a uniform concept: it varies along a continuum from total to very little. In an attempt to make sense of this continuum, and the plethora of terms in use around the world, IUCN developed a classification of protected area types. This analysis is therefore based on the first five of these categories: Strict Nature Reserve, National Park, Natural Monument, Managed Nature Reserve/Wildlife Sanctuary, and Protected (or cultural) Landscape, for areas bigger than 10 square kilometres.

The most recent analysis of coverage using this biogeographical approach has been made in the 1985 *United Nations List of National Parks and Protected Areas* (see charts opposite).

Significantly, it shows:

- ☐ the area covered has increased tremendously in recent years
- ☐ the newly established areas are proportionally larger.

Though a useful tool, biogeography has its limitations. The main drawback is that biome type is not synonymous with habitat type; thus a protected area within a tropical humid forest biome may not necessarily contain tropical humid forest. The reverse can also be true: Udvardy classified all of the Indonesian and Malaysian islands, with the Philippines, in a Mixed Islands system biome, although much of all these islands is under tropical moist forest.

Encouraging trends

The figures look quite encouraging and reflect well on recent efforts to protect tropical rain forest, yet they are not set in the context of total forest cover so the gains may well be relatively trifling. There also

remains still the question of what *actually* remains and what state it is in, both inside and outside protected areas.

Another problem is that although we usually have information on management intentions within a given protected area, what we still lack is real analysis of the effectiveness of management. This is something both CMC and the Commission on National Parks and Protected Areas are working on through the regional system's reviews described elsewhere in this *Bulletin*. National system's reviews are also under way in many countries as part of an effort to ensure that the global coverage of tropical forests is completed while the opportunity remains. Such reviews will be initiated in Gabon and Madagascar in 1986. □

Jeremy Harrison heads the Protected Areas Data Unit in the IUCN Conservation Monitoring Centre in Cambridge, UK. The Unit compiles protected area directories and briefings with worldwide applications.

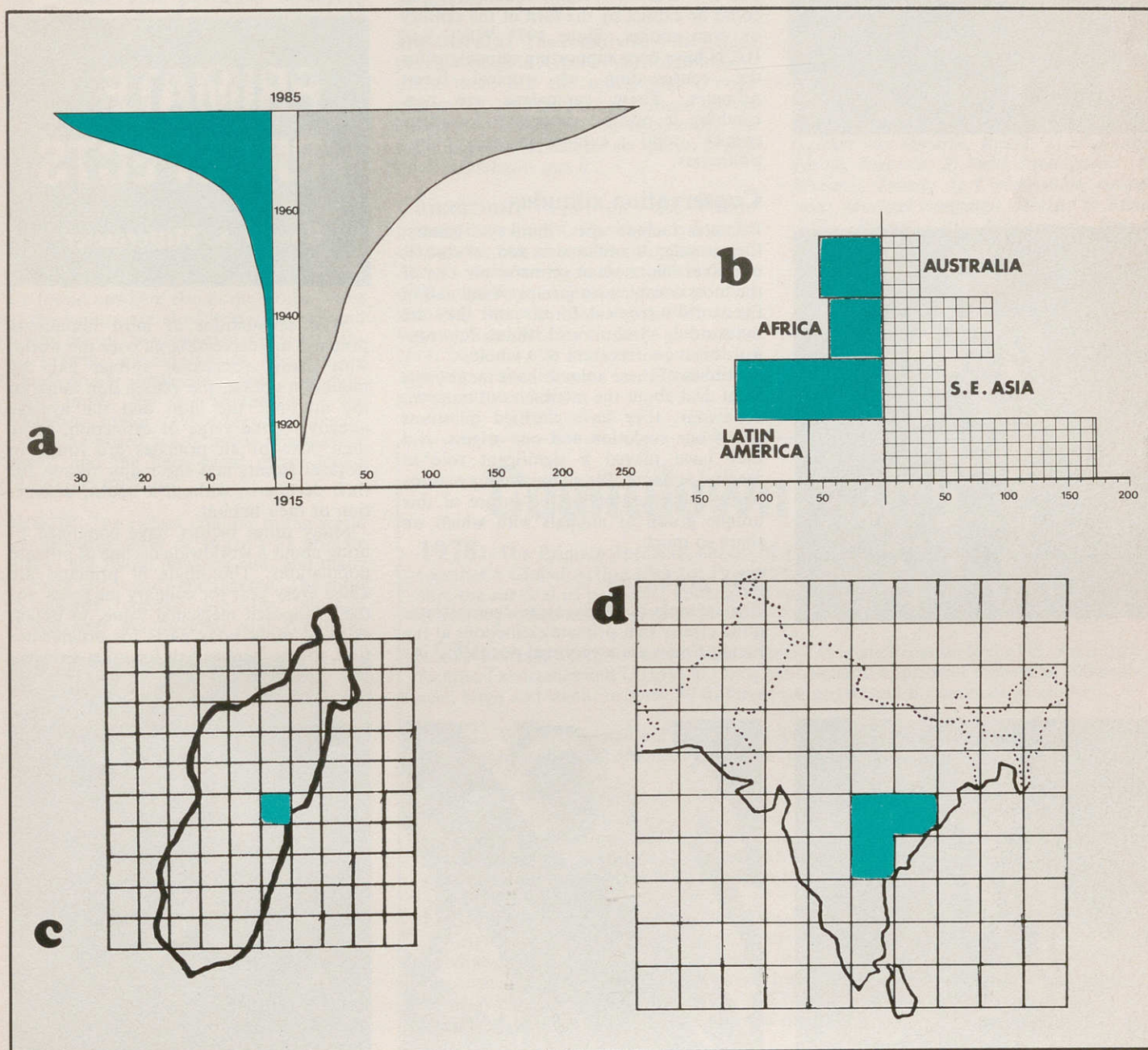
The statistics

Chart *a* shows worldwide growth (in millions of hectares) since 1915 of protected areas in tropical humid forest biome (on right of vertical axis). On left, numbers of such areas.

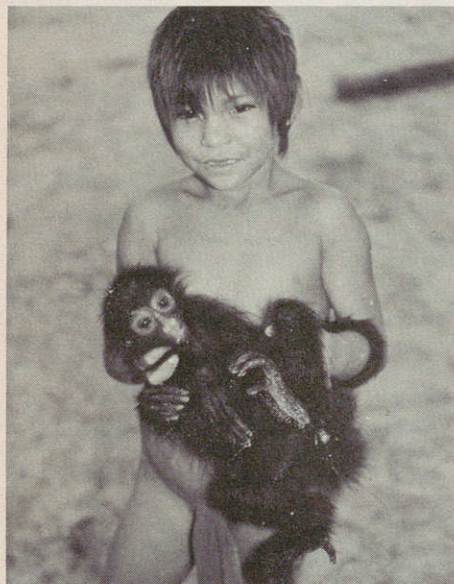
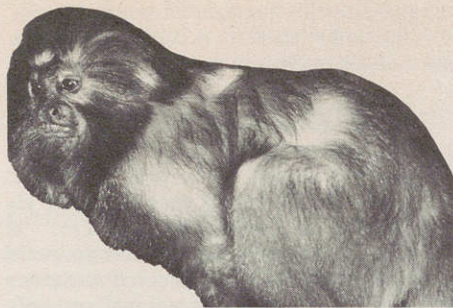
Chart *b* details present coverage (area in square kilometres to right, numbers to left of vertical axis) by region. Figures derived from 1985 UN List of National Parks and Protected Areas. The two data sets do not exactly match as the date of establishment of protected areas is often not exactly known.

c and *d*: the total of all protected areas in 1940 was roughly equivalent to the size of Madagascar: barely 2% were in the tropical humid forest biome. Today, the global protected area amounts to the combined area of India, Pakistan, Bangladesh and Sri Lanka: around 8% is under tropical humid forest cover.

Data processed by IUCN's Conservation Monitoring Centre.



SPECIES AND GENETIC RESOURCES



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Conserving habitats gives an obvious boost to species conservation. But things can often happen the other way around, especially when the species involved are our closest relatives.

ON 3 MAY 1984, national Brazilian television networks reported the release of the first zoo-born Golden Lion Tamarins into the wild, in the Poco das Antas Reserve. Animals which at one time were so used to captivity that they could not peel their own bananas, now can survive successfully where their ancestors were driven out.

According to IUCN minimum estimates, *one out of every three* of the world's 200 primate species is already in some danger and *one in seven* is highly endangered and could be extinct by the turn of the century or even sooner. Since 1978 WWF and IUCN have been supporting campaigns for the conservation of tropical forest primates. These campaigns are now resulting in positive protection for many species and ever-increasing public awareness.

Conservation stimulus

Primates include apes, monkeys, lemurs, lorises, galagos and tarsiers and, of course, ourselves. Nonhuman primates are one of the most conspicuous groups of animals in the world's tropical forests and they are outstanding symbols and stimuli for tropical forest conservation as a whole.

Studies of these animals have taught us a great deal about the intricacies of our own behaviour, they have clarified questions about our evolution and our origins, and they have played a significant role in medical research. We all have many reasons to be concerned about the future of this unique group of animals with which we share so much.

The problems

The example of Madagascar demonstrates quite clearly that primate extinctions at the hand of man are a very real possibility. At

least seven more genera of lemurs existed there when the first people arrived some 1500 years ago, including some spectacular species like *Megaladapis*, a huge terrestrial lemur that grew to be as large as a female gorilla. Unfortunately, all seven were driven to extinction by human hunting pressure and habitat destruction. If present trends continue, many of the living species could disappear as well.

PRIMATE PROSPECTS

Russell A. Mittermeier

Wild populations of most nonhuman primates are decreasing all over the world, with many spectacular species like the mountain gorilla, the golden lion tamarin, the muriqui, the indri and the aye-aye already on the verge of extinction. More than 90% of all primates are found in tropical forests and the major reason for their decline is, without a doubt, destruction of their habitat.

Many other factors have combined to bring about a worldwide decline in primate populations. Thousands of primates are killed every year for culinary purposes, for their supposed medicinal value, to obtain skins or other body parts for ornamentation, to use them as bait for other animals,

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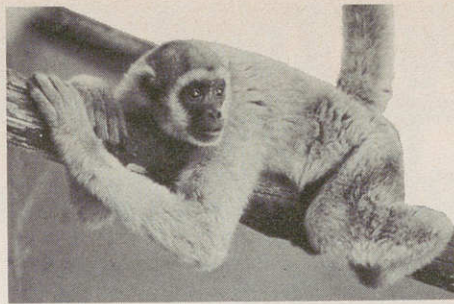


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or even to eliminate them from agricultural areas where they have become crop raiders. Certain species (such as woolly monkeys and spider monkeys in Amazonia) have already been eliminated from large areas of otherwise suitable forest habitat by over-hunting.

Species that have been hurt by the trade in live primates include the chimpanzee and the cotton-top tamarin, both of which were important biomedical research subjects, and the woolly monkeys, which were and still are very popular as pets in Brazil.

Five countries together account for some 150 primate species, or 75% of the world total. Although they are by no means the only countries that will be emphasised in the Campaign, it is clear that they are essential elements in any effort to maintain the diversity of the world's primate fauna.

Madagascar: Home to 13 genera and 28 species of lemurs, all but two of which are found nowhere else in the world. Most of the lemurs are already endangered and several are on the verge of extinction. Highest priority species include the aye-aye (*Daubentonia madagascariensis*), the indri (*Indri indri*), the five subspecies of the diademed sifaka (*Propithecus diadema*), the broad-nosed gentle lemur (*Hapalemur simus*) and the hairy-eared dwarf lemur (*Allocebus trichotis*).

Brazil: The richest country in the world for primates. 35% of Brazil's 51 primate species are found nowhere else, and many of these are already endangered. The most endangered species are the muriqui (*Brachyteles arachnoides*) and the three

lion tamarins (*Leontopithecus spp.*), all of which are endemic to the Atlantic forest region. Species of special concern in the Brazilian Amazon are the spider monkeys (*Ateles spp.*) and the woolly monkeys (*Lagothrix spp.*), both of which have been reduced to precariously low levels by heavy hunting.

Zaire: Zaire's rich primate fauna is very poorly known. Special emphasis will be placed on the pygmy chimpanzee (*Pan paniscus*) and the eastern lowland gorilla (*Gorilla gorilla graueri*), both of which occur only in Zaire, and on the highly endangered mountain gorilla (*Gorilla gorilla beringei*).

Indonesia: The country with the richest primate fauna in Asia. Of particular importance there are the orang-utan (*Pongo pygmaeus*), the four unique primate species endemic to the Mentawai Islands off the coast of Sumatra, and the six species of gibbons (*Hylobates spp.*).

Cameroon: Third on the world primate diversity list, Cameroon is a major stronghold for a number of endangered African species, such as the mandrill (*Mandrillus sphinx*). A major initiative was launched there in 1981 to establish three large national rain forest parks that would cover some 11,000 km² and would be of enormous significance to international primate conservation. □

Photos, clockwise from upper left: 1) Golden lion tamarin, Brazil; 2) Mountain gorilla, Rwanda; 3) Indri, Madagascar; 4) Muriqui, Brazil; 5) Conservation education: Muriqui campaign, Brazil; 6) Mandrill, Korup; 7) Ring-tailed lemur, Madagascar; 8) Sifaka, Madagascar; 9) Capuchin monkey being prepared as food, Suriname; 10) Capuchin monkey shot for food, Suriname; 11) Black spider monkey kept as pet, Suriname.

Photos by Russell Mittermeier except 2) R. Weyerhauser, 6) WWF/Schafer, 9) and 10) M.J. Plotkin.

Countdown to Action

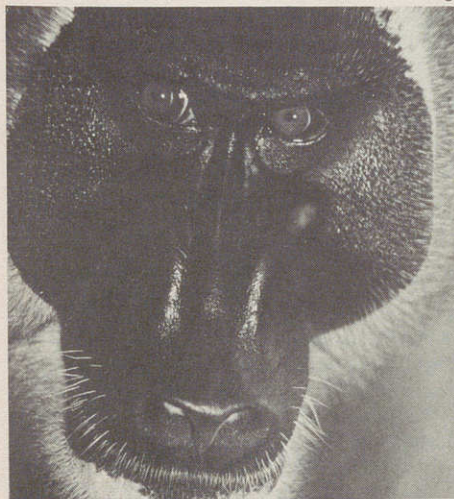
1978: The Primate Specialist Group of IUCN's Species Survival Commission put together a Global Action Plan for Primate Conservation. Main objectives were to ensure the survival of particular endangered species wherever they occur and to provide effective protection for primates in areas of high diversity or abundance.

1979: World Wildlife Fund created a special Primate Program in the US. Since then technical assistance and US\$3M in funds has helped to implement more than 100 projects, large and small, in some 30 different countries, and it continues to grow.

1982: WWF launched a Primates and Tropical Forests Campaign. This has provided more than US\$2.5M for 60 projects in 14 countries.

1985: WWF launched a special Global Primate Conservation Campaign in the US. Its goal is to raise US\$1M — 'A Million for Monkeys' — as soon as possible to carry out projects on behalf of the most endangered primate species and their forest habitats. A sampling of the species and countries that WWF will focus on is given below, and a wide variety of approaches will be used in the projects supported by the Campaign.

1985: The African Primate Action Plan, one of a series of regional plans updating the original Global Plan for Primate Conservation, as a guide for primate conservation activities for the remainder of this decade, was compiled by John Oates. It has been a key document in identifying priority areas for the development of projects to be funded in the WWF 1986 Africa Programme. IUCN has sought to influence aid agencies and governments to promote the objectives of the Plan.



Local Knowledge Too Late to Save Wild Mangoes?



Other IUCN Programmes, like the Wetlands or the Plants programmes, offer scope to achieve many goals that interlock with the Tropical Forest Conservation Programme. J.M. BOMPARD and A. KOSTERMANS describe a plant genetic resource conservation project which forms part of the Plants programme; it sounds a warning about side-effects of large-scale resettlement programmes.

RECENT WORK has shown that instead of the ten species of wild mangoes previously recorded in Borneo's East Kalimantan province (one of the main centres of origin for the genus *Mangifera*) there are actually sixteen species. Local Dayak people have proven a rich source of knowledge on this genetic variety.

Fourteen of the 16 species have edible fruits. Dayak people have acquired a deep knowledge of many kinds of forest products, notably wild fruits, thanks to their close relationship with their forest environment. They are able to recognise and name the many local wild mangoes. Many sweet or sweet-acid fruits are esteemed, but fruits which are sour are also commonly used as an ingredient in the preparation of *sambel*, a hot side dish eaten with rice.

Groups of Dayaks, settled along rivers, still move into the forests every year. They establish temporary encampments during the fruiting season to collect wild durians, mangoes, rambutans and other fruits. Prized fruits are brought back to the village and planted. Accordingly most of the wild mangoes have been brought into semi-cultivation by the local people and can be found in the *ladangs*, village orchards or

surrounding secondary forests near the settlements. The high diversity of mangoes in old orchards therefore gives some indication of the abundance of wild *Mangifera* species locally, but useful plants have also accompanied people in their migrations. Some trees have escaped from orchards and become naturalised in new areas. The native area of *M. odorata*, for instance, remains unknown and a hybrid origin has been suggested.

Resettlement omens

However, this domesticated gene pool is under threat. At a time of rapid change, this knowledge is gradually being lost as schooling and other influences on the younger generation break up the traditional ways of life.

The cultural background and native environment of Javanese people resettled in Kalimantan is quite different. They use one word for mango when referring to many of the wild species of Kalimantan. As they prefer to use preserved fruits of tamarind as

the acidic ingredient in *sambel*, they consider any mango tree bearing sour fruits useless except for timber.

This is a bad omen for the survival of many *Mangifera* species in view of the future increase in the number of transmigration programmes. Conservation of genetic resources in the area must be concerned not only with protection of the rich lowland forest in Kutai National Park, but also with tapping valuable Dayak knowledge while it still exists.

J.M. Bompard is a tropical botanist based at Montpellier, France, who has worked extensively in South-East Asia.

A. Kostermans is a systematic botanist, based at the herbarium at Bogor, who has unrivalled knowledge of the vegetation of Indonesia.



A selection of mango species. Resettlement pressures may severely reduce this diversity.

Photo: IUCN

Non-timber products THE BOOM NOBODY NOTICES

IT IS ESTIMATED that one species in six of tropical moist forest plants could serve non-timber purposes — a minimum of 15,000 plant species from these regions could well offer potential to meet our material needs. In several countries where reliable cash statistics can be found, 'minor' forest products take on major economic significance.

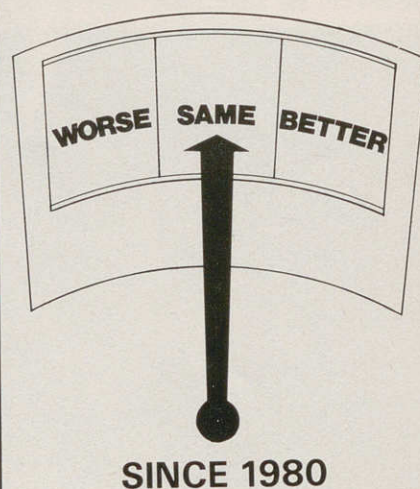
- Non-timber products — essential oils such as citronella, sandalwood and patchouli, fibres like rattan, exudates and diverse other classes of product — earned at least US\$32 million for Indonesia in 1980.

- In India 'minor' forest products, with a value of US\$134M, accounted for 40% of forestry sector revenue and 63% of forestry exports in 1977. Revenues increased at more than 15% per year from 1970-77 (much faster than commercial timber) and so-called minor forest products generated more than 70% of employment in the forestry sector.

These national figures for India do not account for products traded locally, which do not enter the cash economy and are estimated to outnumber formally marketed goods by 3:2. This ratio implies a realistic national value of more than US\$2 billion a year.

Norman Myers

ATTITUDE OF FOREST PRODUCT INDUSTRIES



AFRICA AND MADAGASCAR

KORUP: New Approach to Conservation

Africa has special problems, among them runaway population growth, drought and lack of systematic resource management. But there is every chance that the unique forest of Korup and its fauna will survive into the future. STEVE GARTLAN and DAVID MOMO describe a regional management plan which could provide a model for many other African protected areas.

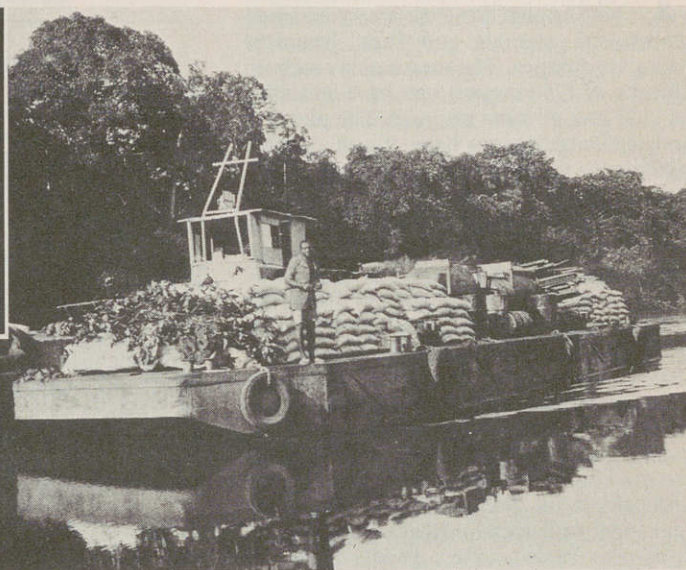
THE KORUP National Park in Cameroon, an area of 125,000 hectares, lies in one of the key areas for forest preservation in Africa. The forest has survived since before the last Ice Age and is very rich in species with a high level of endemism. It contains, for instance, almost a quarter of Africa's primate species, and the fauna is still fairly intact.

Fortunately, the biological richness of Korup is matched by the poverty of its potential for extractive or agricultural uses. The forest is dominated by trees which have little commercial timber value, and lies in a remote, rugged area which would make extraction very difficult. Geologically, it is sited on a granite formation, where it is extremely unlikely that valuable minerals would occur. As a result, soils are sandy, acid and extremely infertile. The use of this forest as a National Park may well be the most efficient in economic terms.

Korup also benefits from lying in an inaccessible and undeveloped area of Cameroon. Until a road was opened this year, it could only be reached by a lengthy river journey. Fewer than one person per square kilometre live in the park area itself, and the region has only one industry, the production of oil palm from a commercial plantation. Hunting is a major occupation of the villagers living inside the park area, as 'bush beef' is the main source of protein, and is traded with the urban centre at Mundemba and across the frontier with Nigeria. It is clear that the development needs of the villagers and the food needs of the urban centre must be met if dependence on wild animals in Korup is to be decreased.

Opportunity

These conditions offer a unique opportunity to integrate the park into a regional development plan. In fact, the development of the national park, although offering the greatest degree of protection to endangered habitats, is only one aspect of a comprehensive rural development project.



Better harvests for farmers in areas surrounding protected forests means less pressure on wild species.

National parks have traditionally been areas into which foreign visitors have come. People have been excluded from their traditional lands with neither explanation nor compensation.

In Cameroon, compensation for resettlement is mandatory at rates set by government, and conservation education is seen as critical to the success of the Korup project. If people do not understand the need for a national park, there is no chance of its long-term survival or of a respect for the boundaries and legal constraints on the part of local people. Similarly, long-term survival is unlikely if the local population does not derive real and immediate benefits from the establishment of the park.

What small economic impact they have had at the local level has often been negative.

Involvement

The public has been involved at all stages of the development of Korup, and the people welcome the idea of a national park in the region. They understand that there will be a need for some resettlement of villages from inside the park in order to reduce hunting within the park area. This will be carried out with regard to the needs of the people for improved services and development facilities.

Ethnic groups will be maintained within their traditional heartlands, but settlements will be moved to carefully surveyed, more fertile areas, in consultation with the chiefs of the villages concerned.

Protein supply

In the new settlement areas a complete range of domestic and social facilities will be provided. The problem of provision of protein will be addressed by breeding pro-

grammes using traditional meat animals, but also by the introduction of such untraditional animals as cane rats (*Thryonomys swinderianus*), rabbits and perhaps duikers. Cottage industries will also be encouraged.

One promising area is the production of plant products of potential medicinal use, as the vegetation of the area is unusually high in biologically active compounds of this nature. The bark of *Astonia congensis*, for instance, is used for nursing mothers who cannot feed their newborn babies, and induces milk within twenty minutes. Other local treatments for schizophrenia have been found to be remarkably effective.

The novel part of this project is the integration of the park into the regional development plan. Activities such as road construction are expensive and require government involvement at the highest levels. They are now being planned with the needs of the park in mind. Bilateral aid agencies of several countries have shown active interest in this innovative approach to conservation and major participation is now being sought. If the project succeeds, there is every chance that the unique forest of Korup and its fauna will survive far into the future. The method used to develop it will then be able to serve as a model for similar projects elsewhere in Africa. □

Steve Gartlan is a primatologist based at the Wisconsin Regional Primate Research Center in Madison. He has spent 17 years working in the rainforests of Cameroon and can claim a large share of the credit for the establishment of the Korup National Park.

David Momo is Director of Wildlife and National Parks for Cameroon, based in Yaoundé. He has been a strong supporter of the Korup project.

PROGRESS IN TANZANIA

better farming means better protection

THE EAST Usambara Mountains of northeastern Tanzania are probably best known for their many endemic plants and animals and their beautiful forest landscapes. The mountains reach an altitude of 1250 meters, and have a rainfall of 1500 mm or more per year. The pleasant and fertile conditions have attracted many subsistence farmers and other users to the forests. The result is that the forest area is decreasing, some tree species are being depleted, and forest understory is being replaced by cash crops.

These conservation problems have not gone unnoticed in the 250 km² of remaining forest in the East Usambaras. The first step was to identify the kinds of exploitation and their consequences. For example, the forests have been a valuable source of quality hardwood timber. Also, because the growing conditions are excellent for tea and cardamom, these have become important local cash crops. Other crops, such as bananas, sugar cane, sweet potatoes, maize, cocoyams and cassava, are grown.

Tragedy in sight

Rapid depletion of soil fertility is a major problem. Shifting cultivation by a booming human population is encroaching dangerously on the forests. The consequence is forest degradation and total loss of forest in some places, accompanied by the resulting soil erosion from steep slopes. Along with this, the market value of cardamom and sugar has declined, and not enough food is being produced for the subsistence needs of the people. The potential exists for an ecological and human tragedy on a grand scale.

The value of the forests of the East Usambara Mountains, however, extends far beyond the profits of lumber and crops, though those profits are substantial. The forests are vital as a watershed, providing a dependable year-round supply of water for the settlements and farms of the lowlands. They also contain an inestimable wealth of wild flora and fauna, including many endemic forms.

IUCN has for several years been involved in conservation of the Usambara Mountains. Various projects, financed by WWF, are helping to preserve the biological diversity and promote sustainable uses of the montane forests.

New drive

Now an even greater IUCN involvement is beginning, as part of the worldwide IUCN Tropical Forest Programme. The new project will begin with three years of intensive work, followed by work at a lower level of support and supervision to maintain continuity and momentum.

The first phase will focus on promoting land-use practices which are sustainable yet more productive than present practices. Of necessity, this will mean renewed drives to promote communication and cooperation among local communities. Technical and

**Simon Stuart
and
George Frame**

material support will be provided to help plan and implement the agricultural and forestry projects. And there will be planning and management of watershed forests.

The long-term objective of the IUCN's new East Usambara conservation project is to ensure the sustainability of agricultural and forestry production along with the maintenance of species diversity among the plants and animals of the forests. This will be achieved by a four-pronged effort:

- ☐ watershed must be preserved to provide a dependable year-round supply of water
- ☐ biological diversity will be maintained to prevent the extinction of species that are valuable for food, fibres, and pharmaceuticals
- ☐ sustainable agricultural systems will be introduced on non-forested portions of the mountains
- ☐ sustainable forest management practices, which bring benefits to local communities, will be introduced in buffer areas.

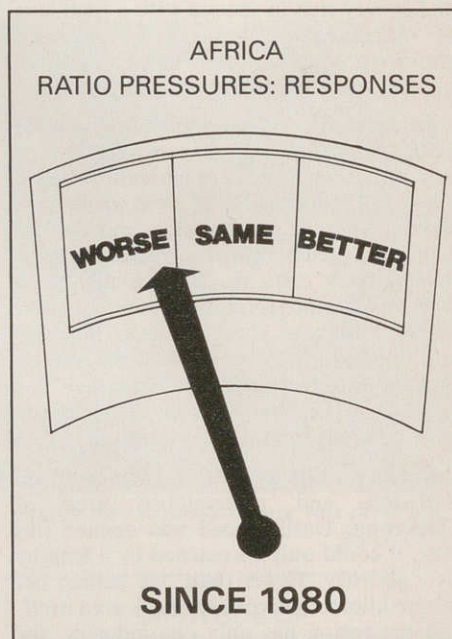
The success of the East Usambara agricultural development and environmental conservation project will extend far beyond its site in the Tanga Region. It will provide a model for future projects, by showing that sustainable and profitable agriculture and forest management can be achieved through a well-planned conservation program. This model of success will be applicable to many of the other montane forests in Tanzania and beyond. ☐

Zoologist Simon Stuart is Species Programme Officer at IUCN.

George W. Frame currently works on African montane forests for the IUCN Tropical Forests Programme Office at Gland.



The African violet, one of the most common houseplants, is almost nonexistent in its natural habitat. Photo WWF/Jon Lovett



Cash crops like tea have replaced tropical montane forests over much of the Usambaras.

Photo IUCN/Simon Stuart

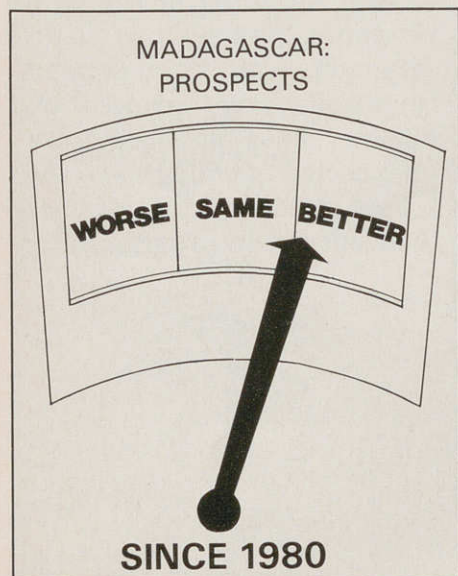
HOPE FOR MADAGASCAR?

DURING THE hundred million years that Madagascar has been isolated from the African continent, it has evolved a remarkable fauna and flora. Eighty-six per cent of the plant species, 95 to 99% of reptiles, and over 50% of the terrestrial birds are endemic. The island is particularly famous for its 28 species of endemic lemurs. Its vegetation ranges from humid tropical forests on the east coast to dry deciduous forests in the west and highly specialised thorny deserts in the south, the latter dominated by the endemic family, the *Didieraceae*.

Fiery newcomer

Man is a relatively recent arrival on the island, and the fauna and flora have evolved until recently in the absence of his activities, particularly in the absence of fire. The vegetation has therefore not evolved the fire tolerance which characterises that of most parts of Africa. Fires are now lit with increasing frequency to rejuvenate pastures, clear land for shifting agriculture, or simply out of sheer destructiveness, and they are destroying the forest cover of the island at an appalling rate. With the disappearing forests, a high proportion of the endemic animals and plants are threatened with extinction.

The vast majority of the population (now more than nine million people) lives by agriculture. Their principle source of energy is wood. The destruction of the catchment forests means that their agricultural lands are deprived of their water supply, and wood is in increasingly short supply for fuel and construction. The continuing degradation of the vegetation of Madagascar raises the spectre of a tragedy — biological and human — on an alarmingly large scale. The special threats which existed to the balance of nature in Madagascar were considered at the meeting in Brunnen in Switzerland as long ago as 1947, when the creation of IUCN was being discussed.



Véronique Barre
and
Jeffrey Sayer

Landmarks

The first major turning point in Madagascar's conservation history came in 1970, when IUCN, WWF and Unesco collaborated with other organisations and the Madagascar Government in holding an international conference on the conservation of nature and resources on the island. This conference led to a much bigger role for both IUCN and WWF in conservation there.

Since 1979, WWF has maintained a full-time representative in Madagascar, Bartélémi Vaohita, and during this period eight projects have been executed in different parts of the island to improve the management of protected areas or to promote education and awareness.

The next landmark event was the launching of a National Conservation Strategy, officially adopted in 1984. For the first time, nature conservation was accepted by the Government at the highest level as a national priority.

More recent initiatives have included the preparation of an environmental profile of Madagascar by IUCN's Conservation Monitoring Centre. This gives the most comprehensive account yet published of the fauna, flora, protected areas and conservation problems of the island. A current IUCN collaborative project with UNEP to produce a system review of protected areas in Africa has also recently yielded a global study of the problems of ecosystem conservation in Madagascar. These two IUCN initiatives were important in leading up to the international conference on *Conservation and Sustainable Development* which was held in Antananarivo in November 1985 thanks to WWF sponsorship. An action plan for the conservation of species in Madagascar was produced by SSC at a workshop held alongside this conference.

All these activities have led to excellent cooperation between WWF, IUCN and the Madagascan authorities and have enabled us to develop a basis on which to launch a more integrated and coherent programme of activities to promote conservation on the island.

Better protected areas

On the basis of the recommendations of the 1985 conference, IUCN has proposed a programme to WWF for the next three years. If the programme is adopted, WWF will be concentrating its efforts on improving Madagascar's system of protected areas. The IUCN protected areas system review will be expanded and a major effort will be made to establish new protected areas in ecosystems which are not at present covered and to improve the capacity of the Madagascan authorities to manage the existing areas.

Great emphasis will be placed on in-service training of management staff and the project will emphasise the stabilisation

of the use of land around protected areas. This will involve the use of agro-forestry and sustained forest management techniques in an attempt to surround protected areas with a green belt of land which is protected against fire and shifting cultivation. A pilot reserve management scheme is proposed for the Andohahelo reserve in the south of Madagascar. This reserve covers, within a small area, a remarkable range of vegetation types from humid forest in the east to dry *Didieraceae* in the west.

As part of its 25th Anniversary campaign, WWF will increase its education and awareness activities on the island. A national environmental resource centre is proposed for Antananarivo and conservation education centres at key protected areas are also planned.

Strategy

IUCN will continue to promote Madagascar's National Conservation Strategy and is seeking funds to establish a coordinating office for this purpose. In addition, a major new initiative is planned for the Lac Alaotra catchment in the north centre of the island. This is one of the most important rice growing areas on the island. The Zahamena reserve, part of which lies in this catchment, has possibly the highest number of endemic bird species in Madagascar, and is a key area for biological diversity conservation.

The link here between conservation of natural ecosystems and biological diversity and the immediate needs of man (in this case for water for rice irrigation) is very apparent. An integrated project is planned which will include promotion of a protected area, the management of natural forests on key watersheds and the promotion of forestry and agroforestry activities in buffer areas around the rice growing plains.

Influencing events

IUCN's influence extends beyond the projects which are executed by ourselves and our WWF partners. We have also been asked to contribute to the formulation of major development projects which have an impact on the natural ecosystems of the island.

In particular, IUCN will consult on a new World Bank forestry project whose budget vastly exceeds anything that could ever be envisaged by WWF or IUCN alone. Perhaps our ability to contribute to conservation on the island lies more in the influence we can exert on such aid donors as the World Bank than on our projects alone. Nonetheless, the fact that we have executed projects in Madagascar for the past 20 years gives us the institutional knowledge and credibility which enables us to influence others. □

Véronique Barre is a zoologist who recently completed her studies on Madagascan lemurs at the University of Paris. She works at the Ecology Laboratory of the Paris Natural History Museum and has consulted for IUCN and WWF on the Madagascar programme.

ATLANTIC FOREST

now for the good news

ONE MILLION hectares in the mountainous Serro do Mar of coastal Sao Paulo, the largest remaining area of Atlantic Forest in Eastern Brazil, have been declared an environmental protection zone. This was a major conservation initiative for which the state government of Sao Paulo deserves a great deal of credit, and reflects the tremendous increase in interest in the Atlantic Forest. Conservation of the region has become an issue of national and international concern.

Although the region is still in a critical situation, much has been accomplished in the last eight years since WWF first became involved in the conservation of the Atlantic Forest. A number of highly endangered species that were on the very edge of extinction are now the subject of special conservation projects that are helping to improve their chances for survival, and the future of several key protected areas is now much brighter.

The Atlantic Forest region of eastern Brazil consists of a unique series of ecosystems quite distinct from the much more extensive Amazonian forests to the northwest, although what has happened in the Atlantic forests shows what could happen in Amazonia over the next few decades if current trends continue. These once stretched virtually continuously from the state of Rio Grande do Norte at the easternmost tip of South America south as far as Rio Grande do Sul, the southernmost Brazilian state.

This range included the typical Atlantic coastal forests on the low-lying coastal plain, the forests on the foothills of the Serro do Mar and related mountain ranges that roughly parallel the coast, and the forests on the slopes of the Serro do Mar itself, up to 1800-2000 metres. In its primeval state, the Atlantic Forest occupied about a million km², making it the third largest region in Brazil after Amazonia and the *cerrado*.

World's tallest

When early naturalists passed through the Atlantic Forest in the first part of the last century, they found some of the world's tallest and most impressive forests, with an especially rich orchid and bromeliad flora and an abundant and diverse fauna.

Even then, however, part of eastern Brazil — especially states like Sao Paulo — had already been colonised for more than two centuries and were starting to show the effects of large-scale habitat destruction. More recently, there has been an enormous increase in the human population of this part of Brazil, with two of the three largest cities in all of South America (Sao Paulo and Rio de Janeiro) in the central portion of the Atlantic Forest.

The result has been widespread, uncontrolled forest destruction for lumber and charcoal, and for making way for coffee

Russell A. Mittermeier

plantations, sugar cane, cocoa, eucalyptus, rubber, cattle pasture and industry, particularly rapid in the last two decades.

Endangered systems

We are now dealing with a highly endangered series of ecosystems in which less than five percent of the original forest cover remains, probably the greatest conservation problem in the Neotropics. Eighty percent of the primates, 39% of all mammals and 54% of the trees in the Atlantic Forest are endemic, and have suffered tremendous decline.

Key primate

WWF began helping to support efforts in 1971 to save the Golden-rumped Lion Tamarin, a spectacular primate species restricted to the lowland forest of the state of Rio de Janeiro. Since 1979, during the course of a programme in the region which has helped to support some 30 major conservation projects, WWF has worked closely with a large number of conservation organisations in Brazil. Its key counterpart organisation is the Brazilian Conservation Foundation which administers all of the projects conducted in the Atlantic Forest region and helps to develop many new initiatives in collaboration with IUCN, WWF and other Brazilian institutions.

Work will continue over the next few years to add to the existing database on the flora and fauna of the Atlantic Forest, to develop management programmes for key parks and reserves representing a cross-section of species and ecosystems, and to step up efforts to train young Brazilian conservation professionals so that they can carry the cause of Atlantic Forest conservation into the future. In addition it is considered important to strengthen key Brazilian NGOs so that they can have more influence and can raise the bulk of funds needed to support conservation in Brazil and continue public awareness and conservation education activities.

Still problems

Recent successes have been impressive, but they should not make us complacent about the future of the Atlantic Forest. The problems that remain are enormous, and a long-term investment of time, resources and energy will be necessary by both Brazilian and international organisations, to ensure that what remains of the Atlantic Forest is not lost. □

Russ Mittermeier is a primatologist with extensive experience in all tropical regions. He is a Vice-Chairman of IUCN's Species Survival Commission and Chairman of its Primate Specialist Group. He has authored numerous papers on primate biology and conservation.

AMERICAS AND CARIBBEAN

FAST-GROWING coppice trees are being used in Jamaica in a system of 'automatic terracing' to rehabilitate steep slopes cleared for agriculture and fuelwood.

ANDREAS OBERLI, Project Manager of Cinchona Botanical Garden, designed the experiment.

Two rows of trees are planted every six metres. Species used are *Albizia lophantha*, *Calliandra calothyrsus* and *Acacia mearnsii* which all fix nitrogen and can grow to 4m in height after eighteen months. Trees are coppiced every two to four years for firewood and to give light to the fields between. Small branches and crop debris from the fields are packed into the tree rows to build up the terrace.

Local response has been very enthusiastic. Village farmers planted the trees, and tree nurseries will be established at local schools in 1986. The Botanical Garden has guaranteed to buy three to four thousand of the trees produced, and schools could also sell fruit, timber and fuelwood. Trees planted on hillsides have profited from unexpected tending by the school children, as a result of their education programme.



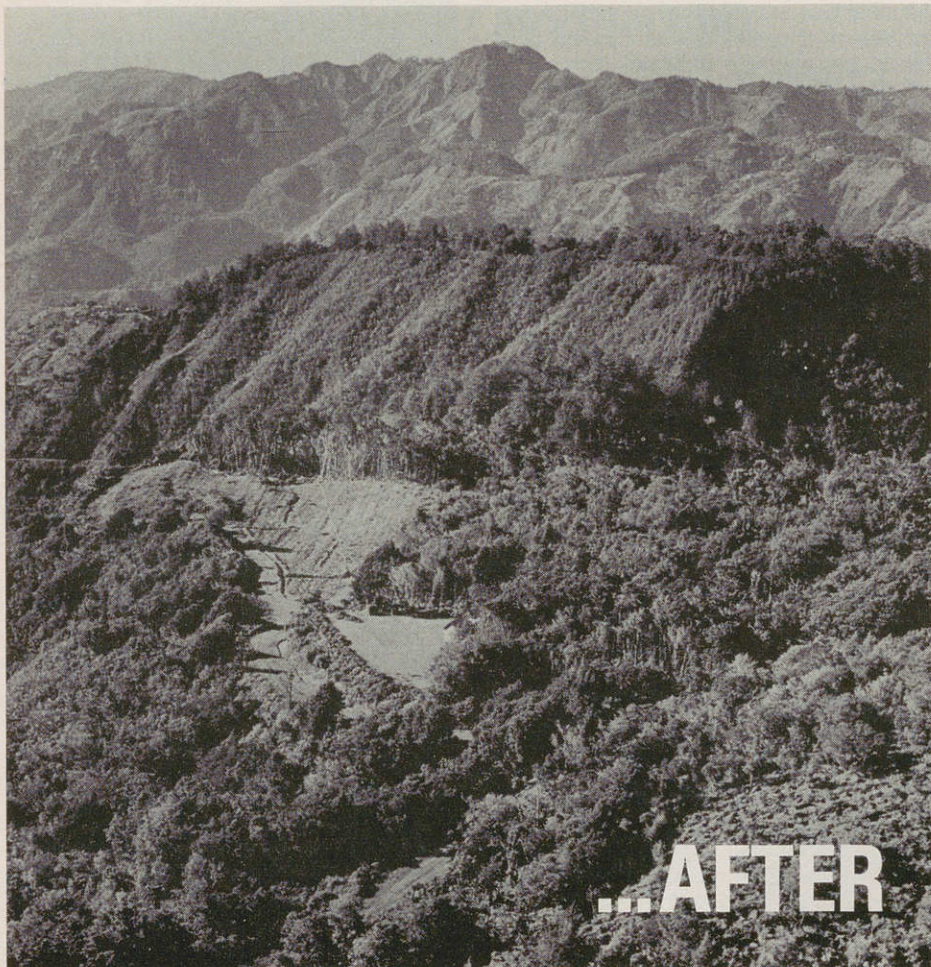
BEFORE...



AUTOMATIC TERRACING IN JAMAICA

A technique pioneered in Jamaica (see text, opposite) transformed this erosion-shattered hillside in just twelve years.

Photos: Oberli



...AFTER

RONDONIA disaster or tough lesson?

Marc Dourojeanni

IN THE 1960s, the Brazilian government built a 1500km road (named the BR 364) between Cuiaba in Mato Grosso and Porto Velho in Rondonia, creating access to 24M hectares of virgin forest, home to an important Indian population. In the late 1970s a US\$1.1 billion programme was launched, with 35% World Bank participation, to pave BR 364, consolidating the settlement of 35,000 families along the highway and facilitating malaria control. Shortly thereafter, a new settlement project was launched to accommodate 15,000 newcomer families.

The *Programme Integrado de Desenvolvimento da Regiao Noroeste do Brazil* (better known in Brazil as POLONOROESTE and abroad as the Northwest Region Development Programme) has since attracted severe criticism from environmentalists, anthropologists, sociologists and economists both within Brazil and (more so) from outside. The programme has become a byword for what *not* to do in matters of development in the Latin American tropical lowlands.

Design not flawed

This situation is doubly alarming because POLONOROESTE, in its conception and design, was very different from previous rural development programmes in the Brazilian Amazon, programmes which even the Brazilian Government recognised as obvious failures.

Under POLONOROESTE, around \$37M were to be spent on projects directly related to environment, forestry and Indian affairs. Most importantly, the overall objective was to establish a carefully thought out form of sustainable development. Decisions unprecedented in Amazon development, such as the establishment and development of a network of protected areas including Indian lands, which cover over 26% of the State territory, were made and duly funded.

New concepts were applied in the settlement area. These concepts foresaw full utilisation of the wood from lands being cleared. They favoured planting of tree crops, discouraged land ownership concentration and extensive cattle ranching, provided for appropriate zoning to avoid clearing of forests where soils are unsuitable for agriculture. Large investments were made in research to help bring these goals within reach. In short, the Programme was the best designed large-scale rural development ever launched in the Amazon.

continued, over

The World Bank's involvement in the Programme, for which it has been widely criticised, was clinched by this evidence of careful design. The Bank had probably never before been so aware of the environmental aspects of a rural development programme in Latin America. The amount of World Bank support for the environment-related components of POLONOROESTE was the highest ever allocated on the continent for a rural development project.

What went wrong?

The greatest stumbling-block was the amazing migration rate into the State, which exceeded all forecasts. The advertising campaign mounted to attract pioneers to the settlements did its job all too well. The fact is that there was not, and is not, enough suitable land to settle all the newcomers. Most of the other problems lay in inadequacies of the institutions responsible for the programme. Political and economic causes, lack of environmental awareness, planning mistakes, administrative and legal problems were all partly to blame.

The explosive demography of Rondonia is a by-product of social unrest in other parts of Brazil. Establishing a wise development in Amazonia is a nearly impossible task if national agrarian policies are not modified to allow a better and more productive use of the land elsewhere. It is essential to cater to the landless through agrarian reform, instead of simply moving them on into new settlements.

Lessons

Three years after POLONOROESTE began, the situation in Rondonia is not, at first glance, much different from the kind of mess other settlements in the Amazon have created. Yet appearances are deceptive. There are basic and key differences which allow us to believe that the future could — after all — get better in Rondonia.

Several measures are available to improve the Programme's further prospects:

- ☐ more efficient use of land already cleared
- ☐ curbs on the clearing of forests where soils are unsuitable for agriculture
- ☐ improvements in the region's protected areas network as a fallback measure in case the others fail.

Rondonia is a perfect example of just how tough it can be to try to create a sustainable style of development in the humid tropics. It is also another example of the need to unify development on a national scale.

Gamble

Rondonia is not a closed chapter in the history of the Amazon. The roulette ball is still rolling and the gamble of pressing on with POLONOROESTE is far less of a risk than just washing the scheme out as a disaster. There are real opportunities for improving the area's prospects. The fight will be tough, not only while the pro-



Unplanned settlement in Amazonia. Rondonia was in a different class from this.

gramme is still in its investment phase, but especially afterwards when national and international attention will wander away from Rondonia's problems.

Above all, the protected areas and the Indian lands should be safeguarded to the last along POLONOROESTE's original lines. The high level of environmental awareness raised in Brazil and on the international

scene, thanks to Rondonia, may turn out to be a cornerstone of Amazonia's future development. □

Marc Dourojeanni, a Vice-President of IUCN, is a tropical forest specialist of the Neotropics. He holds senior positions in several universities and international organisations and chairs the IUCN Tropical Forest Advisory Committee.

ASIA AND OCEANIA

RAINFOREST CONSERVATION IN NEW SOUTH WALES: THE FIGHT FOR THE WILDERNESS

A TEN YEAR campaign for the preservation of the major remaining rainforest areas in New South Wales spearheaded by Premier Neville Wran, has culminated in the declaration of a National Park and nomination of the area as a World Heritage Site. Jim Thorsell of IUCN visited the area in January 1986 and is at present evaluating the nomination for Unesco. He met with Premier Wran, whose strong personal commitment to rainforest conservation is illustrated by his comment in a speech in 1983: "When we're all dead and buried and our children's children are reflecting upon what was the best thing the Labour Government did in the 20th Century, they'll all come up with the answer that we saved the rainforest."

Recent research suggests that the border of New South Wales and Queensland is the meeting place of the southern extremes of the tropical rainforest flora and the northern limits of the Antarctic elements, producing a diverse and unique mixture.

The importance of rainforest conservation in this area has only been recognised relatively recently. Some rainforest areas in New South Wales had been the subject of intermittent conservation efforts for almost a century, but as part of larger proposed National Parks to preserve outstanding mountain landscapes.

In less than two centuries of European settlement the original rainforest in New South Wales, then considered to be 'scrub', has been reduced to less than half its original size by settlers clearing land for farms. More recently, logging of the forest has become more intense as supplies of eucalypt timber became exhausted. By 1976 all accessible rainforest not included in the very small Forestry Commission Flora Reserves was already committed to sawmills.

The campaign by non-government conservation organisations has been through many stages. Catalysed by the unexpected stand of 'alternative lifestyle' people living on the North Coast, public support achieved great momentum with a refusal to accept the adverse decisions of successive government enquiries. Independent scientific advice has been accumulated, particularly regarding alternative rainforest timber resources and measures for the continued employment of forest industry workers. This led in 1982 to the transfer of 120,000 ha of north coast rainforests and associated forests from the management control of the Forestry Commission to that of the National Parks and Wildlife Service. This is the most significant move in rainforest conservation in Australia to date, and demonstrates Australia's ability, as a relatively developed and affluent country, to act against the world trend and set an example.

Cash Incentives for Protection

THAILAND'S OLDEST and best-known National Park, Khao Yai Park, has suffered from encroachment by shifting agriculture and poaching of forest products since its creation in 1962. Several animal and plant species are now rare in areas where they were abundant just a few decades ago and about five percent of the park is now completely deforested.

Village poverty is a root cause of park abuse. The average annual per capita income in these communities is only 5330 Baht (US\$197), even less than the lowest regional PCI in Thailand. The Khao Yai Project aims to provide villagers with significant economic benefits from the park without cutting trees and shooting wildlife. One way of doing this is to develop tourism programmes based in the villages, with the bulk of tourism proceeds going to the villagers.

Trekking

A pilot wilderness trekking programme was developed in a low-income agricultural village, Ban Sap Tai. The villagers quickly became aware of the potential benefits, and the programme has even won the trust of the village's biggest and most knowledgeable poacher, who has finally

**Phairot Suvanakorn
and
Robert J. Dobias**

agreed to lead future treks. His view was that being a trek guide would be superior to poaching if only trekking groups could come regularly.

Despite objections from several conservationists that trekking in tropical forests would never attract tourists, the programme has already attracted a wide range of people, from 20-year-old university students to 50-year-old company executives. An international tour agency has recently expressed interest in the trekking programme and hopes to establish a regular trekking schedule at the village.

The treks provide opportunities for bird-watching and photography, long rests at picturesque waterfalls and splendid views from the park's mountains. Trekkers also experience life in a rural Thai community and can acquaint themselves with the villagers they are helping to support.

Each guide and porter is paid three times what he can expect to receive for village labour and well above the government's minimum wage, with a bonus if elephant, tiger, gaur or other elusive wildlife are found. A total of nearly 10,000 Baht (approximately US\$400) in cash and materials went directly to the village from the last major trek, including a generous contribution from the trekkers to begin a lunch programme at the village school.

Attitudes changing

In conservation terms, a subtle change has appeared in the attitudes of some prominent villagers: the trekking programme has shown them a way to receive benefits from the park without destroying it. The

villagers themselves are bringing up the topic of park conservation, rather than stressing their need to use the park's resources to survive. This awareness is the foundation upon which future rural development efforts planned in the park can build.

The programme's strength was recently tested when Royal Forestry Department officials ordered eleven families out of their homes, located within the park. Despite this necessary, but potentially divisive, action the villagers mounted little protest and are as eager as before to see the trekking programme continue. These villagers are unlikely to passively allow poachers to undermine a programme which is improving their economic situation.

A foundation

From a nucleus of trekking villages a solid foundation of citizen support for park objectives can be built which will in turn be a catalyst for stronger regional and national government support. A community-based Environmental Protection Society has now been set up in the village. It acts partly as a credit cooperative, informal education centre and collective business enterprise besides being a base for conservation activity. Many villagers have joined and conservation benefits can now be more widely spread through the community.

A most promising sign for the future is that the wilderness trekking concept seems to be catching on in other areas of Thailand. During a recent National Wildlife Day seminar the trekking programme was included as a recommended method for better conservation of Thailand's protected areas. The project is showing that rural people who have historically exploited park resources because of poverty are amenable to park conservation if they can gain economically. □

Phairot Suvanakorn is Deputy Director General of the Royal Thai Forestry Department and was closely involved with the establishment of Khao Yai.

Robert J. Dobias is a biologist who works with the Association for the Conservation of Wildlife and is responsible for the Khao Yai Project.



Rainforest rally in New South Wales.



Wardens with confiscated poachers' equipment, Khao Yai.

INDONESIA

can state policy change?

Whatever the reasons for the disappearance of tropical rain forest, they have one common feature; they are the direct consequence of the economic and social policies of the countries concerned. The aim of the forestry policy reviews of the International Institute for Environment and Development (IIED) is to alter government priorities in such a fundamental way that rapid action on forest conservation ensues. DUNCAN POORE describes the approach in Indonesia's case.

THE RECENTLY completed Indonesian Policy Review has won wide support in the country, and is seen as a practicable, coherent strategy. The formula seems to work in Indonesia — can it work in other countries? Can the destruction and the degradation of the tropical forest be slowed down? Can the forest and its lands be used in a sustainable manner to benefit the people of the countries in which it is found? These are questions that exercise thoughtful politicians throughout the tropical world.

But how? This question has so far defied effective answers. The cry of the decade has been for pilot projects which, it is argued, will lead to wider application. These have been useful; but alone they are no longer enough. Too often the pilot project is all that remains, a brave and solitary monument to another unexploited good idea. Meanwhile destruction and wastage continue.

Comprehensive, extensive programmes are needed in all tropical countries if their land resource is not to be needlessly wasted; and to waste it would be criminal, for it is the most important long-term resource that they possess.

A key element in the successful implementation of the FAO Tropical Forestry Action Plan is the correct diagnosis of the ailments afflicting the countries in greatest need of assistance. IIED is carrying out reviews in a number of countries, specially designed to both identify the real priorities and to create a sense of urgency. Until governments are convinced that these problems are matters of the greatest national importance, results are likely to be too little and too late.

Principles

The first review, carried out in Indonesia at the request of IUCN and WWF, is complete, and others in Cameroon and Zaire will begin this year. IIED adopts three fundamental principles. The first is to involve as many interests as possible in the review: ministries, the private sector, academics and NGOs. The second is to persuade government and the public that forest lands are a national asset of such importance that they must form a central pillar of state economic and social policies. Thirdly, and perhaps most important of all, IIED tries to use the review process itself to change the attitudes of those participating in it.

The review is conducted by a close partnership between IIED staff and prominent

Indonesians, not by an outside team; it involves canvassing views from as many different shades of opinion as possible and drawing out reactions by means of discussion documents; and it does not end with the production of a report.

Problems

The problems affecting the tropical forests of Indonesia have various roots, two of fundamental significance. The very large and rapidly growing population of the very fertile Inner Islands (Java, Madura and Bali) is severely degrading its land resource with very dangerous consequences for its mountain soils and for the irrigated rice lands that depend upon these for stable supplies of water.

On the other hand it has been government policy to use the Outer Islands (particularly Sumatra, Kalimantan and Irian Jaya), mainly covered by tropical rain forest with massive and valuable timber reserves, to provide the capital for national development and the land for settlers from Java.

Both of these processes have moved so fast that they can only be arrested by a deep reappraisal of many aspects of policy, such that proper value is placed on the sustainable management of the tropical land resource.

Recommendations

The essence of review recommendations is this. Each area of forest land should be allocated to the purpose for which it is best suited and in which it can be used sustainably. Those to remain under forest should be removed from the control of timber concessionaires and managed as a national asset by the Forest Department.

Only land inherently suitable for agriculture should be transformed to agriculture and degraded lands should be used before high forest. The pressure on the forest should be reduced by policies for employment, including an involvement of local people in forest management for timber.

All policies of Government should be examined for their effect on forest lands and modified if they are inconsistent with sustainable management.

The elements are not new; the linkages and the urgency are. If accepted, it should ensure that Indonesia's portion of funds from outside are spent on priorities that are real and well thought out. □

ASIA
RATIO PRESSURES: RESPONSES



AWARENESS AND TRAINING

A Thriving Literature

Of books on tropical forests, there are a great number. This is as befits one of the greatest issues of our day. Ten years ago there were hardly any such books. May the pen prove mightier than the axe, says NORMAN MYERS.

First, the mainly scientific items. *Tropical Rain Forest: Ecology and Management*, edited by S.L. Sutton *et al.* (1983, Blackwells) presents the proceedings of a 1982 Leeds University symposium, and contains 34 papers on diverse topics, some of interest to conservationists (rainforests and Britain's foreign policies; the case for an Organization of Timber Exporting Countries; Rubinoff's mass subsidy idea), while others are more abstruse (guild size of Psocoptera).

The Amazon, edited by the great German limnologist Harald Sioli, 1984, Junk Publishers, assembles 29 contributions from Amazonia specialists, and presents first-rate science, though the conservation implications are not spelled out clearly enough for the hands-on practitioner.

Tropical Rain Forests of the Far East, by Timothy C. Whitmore, a 1984 revision of his 1975 magnum opus (Clarendon Press) may well remain the standard scientific work on the region's forests as long as there are any forests to be standard about; the management ramifications are given greater attention than in the 1975 version.

Social factors

Next, the semi-scientific, semi-conservationist books. *Land, People and Planning in Contemporary Amazonia*, edited by Françoise Barbira-Scazzocchio, (1980, Centre for Latin American Studies, Cambridge University), is one of the best, containing 34 papers by leading gurus, mostly academics, but generally relevant to the conservationist's needs since the emphasis is on the social sciences, hence on what motivates people to knock over Amazonia as fast as they can move — and what might motivate them to do something else.

Developing the Amazon, by Emilio F. Moran (1981, Indiana University Press) takes a hard-nosed look at agriculture, fishing, forestry, and settlement schemes of sundry sorts, among other attempts to develop Amazonia, concluding that the path of prudence lies with much more prudence than has generally been the fashion (it is a little short on alternatives).

A more recent offering, in fact 1985 vintage, is *Amazonia*, edited by Ghilleen T. Prance and Thomas E. Lovejoy, in the Key Environment series by Pergamon Press. It presents 22 papers by mostly pragmatic and 'real world' aficionados of Amazonia, though it may prove a little too descriptive rather than prescriptive for the 'must get on with it' conservationist.

A second 1985 publication is a double-volume work, *Change in the Amazon Basin*, edited by John Hemming (Manchester University Press) with 35 symposium papers, and a stack of up-to-date analyses of how man is changing the face of Amazonia.

Yet another 1985 book of similar ilk is *Frontier Expansion in Amazonia*, edited by Marianne Schmink and Charles W. Wood (University of Florida Press) with 20 symposium papers that deal generally with the multi-variate impulses that drive people into Amazonia (and sometimes out again). All these books are scholarly and authoritative, presenting the essential information that conservationists need to understand what makes rainforests tick. Regrettably there is not always as much indication on how to keep them ticking. But as state-of-the-art surveys, they do a good job, at least as far as Amazonia goes. If only there were similar books on Southeast Asia, where the destruction is proceeding far faster.

Conservation leads

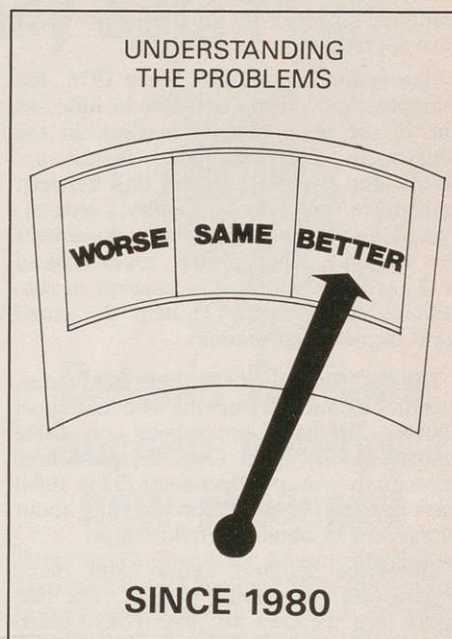
Now for the more explicitly conservationist books. *Tropical Nature*, by Adrian Forsyth and Ken Miyata (1984, Scribner) looks only at tropical forests of Latin America — but what a splendidly detailed and clear look it takes! Written in travelogue form and spirit, it puts over the complexity of rainforests with admirable simplicity. We learn about food webs, ecological interdependencies, pollinators, nutrient cycling, and many other intricacies of rainforest life, with all the immediacy of journalists — yet the authors are start-out scientists (authoritative too). Most important of all,

they demonstrate that conservation of tropical forests is not so much a biological problem as an economic and political problem.

Next, *Dreams of Amazonia*, by an ex-Time-Life man from Rio de Janeiro, Roger D. Stone (1985, Viking). A lucid, impassioned and eminently readable account of the problems and opportunities of Amazonia, the book shrewdly weighs the political context of the Brazilian government's relations with its own national communities, and with the outside world. A top-flight 'backgrounder' for the conservationist who recognises that conservation, like politics, is the art of the possible.

Thirdly, *In the Rainforest* by Catherine Caufield (1984, Knopf). Another journalist's account and reflections, this book ranges over the entire biome — thank goodness. It considers how we all have our hand on the chainsaw in one way or another; how we shall all lose if the forests keep on disappearing; and how we should all pitch in with an international campaign in support of the greatest celebration of nature ever to appear on the planet. Caufield writes with marked verve, and her sense of conviction comes across strongly. The closest of all the books listed, to a 'read at one sitting' book. □

Ecologist Norman Myers is himself the author of seminal works on tropical forest conservation, including *The Sinking Ark* (Pergamon, 1979), *A Wealth of Wild Species* (Westview Press, 1983) and *The Primary Source* (Norton, 1984).



TRAINING: CATIE shows how in Central America

SHORTLY BEFORE his death, at a meeting of the North-South Round Table, at Oiso, Japan, in October 1982, the eminent conservationist Aurelio Peccei made an amazing public declaration. He felt that the ongoing large scale tropical deforestation phenomenon was much more dangerous than the atomic arms race:

"We will not be so stupid as to completely exterminate ourselves, but we lack the vision and the understanding to fully comprehend the damage that we are perpetuating by removing the tropical rain forests, the very basis of our present and future welfare. This is the number one problem."

The Oiso meeting went on to recommend "the establishment of a crash programme for reforestation through a special international project to be called TREE (Training, Research, Environment, and Education)."

Only one political leader from Central America was present and although the urge to curb deforestation is shared by many influential decision makers throughout the industrial world, it is in the tropical countries concerned where awareness based on facts, coupled with the will to take remedial action, is of course most needed. Such an abyss between the majority of decision

makers and land-use scientists can only be bridged through training and building up of potential local leaders.

Gerardo Budowski

CATIE's role

In Central America a great part of that responsibility falls upon CATIE (the Spanish-language initials for the Tropical Agricultural Centre for Research and Training) an international-cum-regional organisation located in Turrialba, Costa Rica. There, more than 160 scientists are engaged in providing sustainable alternatives to destructive land uses.

A number of field and local representatives of CATIE are presently engaged in joint research and training activities with national organisations in most central American countries. Jointly with the University of Costa Rica, CATIE offers an MS course for Central Americans and other Latin American and Caribbean professionals. The MS degree is offered at headquarters but the fieldwork can be done in the country of origin. Other students come for short courses and in-service training.

Renewable resource training

The Renewable Natural Resources Department of CATIE covers forestry, agroforestry and wilderness and watershed management. It is therefore highly relevant to the supply of tomorrow's tropical forest conservation managers. More than 50 graduate students in the past five years have specialised in the subjects.

Innovation is essential. Since 1976, for example, agroforestry has been included as one of the main programmes within the department. This has proven highly successful and offered a useful link between agriculture, animal husbandry, erosion, hydrology and even wildland management (for example, where buffer zones around parks are concerned). The concept of sustainable development to help the small rural farmer is paramount.

Besides formal MS degree candidates, there are about 150 students who take short courses. Demand for places on these courses is very high. Over the past three years an average of 80 students (92 in 1984) have applied for admission but only about 22 succeed in obtaining fellowships.

In-service students come from many origins and for varying periods. The majority are Fellows of the Tokyo-based United Nations University, with which CATIE has been associated since 1977. In the past five years they have come from Thailand, Nigeria, Indonesia, Tanzania, India, Philippines and Ghana, as well as from a number of Latin American countries.

How have students fared?

Although it is not always easy to trace the subsequent careers of students, some indications concerning the nearly 200 students who have graduated from the Renewable Natural Resources Department since 1952 are available.

Ten MS graduates from CATIE went on to get their PhD from universities in the USA, UK and Germany. Many have been widely published and have had noteworthy careers in international organisations. Six have served or are still serving as deans of forestry schools: others are now university professors. The majority are still working in the 'front line' of natural resource management as heads of forestry services, heads of National Parks services, or managers in research and planning institutions.

Prospects

Presently the work in the Department is supported by sponsors, bringing about \$4.2 million to the Department's budget, out of a total budget of about \$13 million for all of CATIE and its 160 professional staff. A likely doubling or tripling of the student intake is foreseen, along with an increase in teaching staff. The main limitations are lack of housing, the need for more instructors and (as usual!) a scarcity of fellowships. □

Former IUCN Director General Gerardo Budowski now directs the Department for Renewable Natural Resources in CATIE. A complete profile of CATIE's work will appear in a forthcoming issue of the Bulletin.

THE UNEXPECTED

Rubber tappers mobilise

Robert P. Lamb

THE POPULAR image of an Amazon rainforest inhabited by a few scattered Indian tribes could not be more wrong. In Brazil alone it is estimated that there are over half a million rubber tappers and other forest dwellers. Every year they produce raw materials and food from the intact forest valued at close on US\$100 million.

In a dramatic development the rubber tappers — *seringueiros* — are mobilising to protect the rainforest, the only source of their livelihood. The *seringueiros* have formed a National Council which held its inaugural meeting in Brasilia in October. A glance at their demands sent to President Sarney via sympathetic congressmen indicates that there is now a powerful grassroots movement working for the sustainable utilisation of the Brazilian rainforest. Not yet a success story, but it shows every sign of becoming one.

Chief among those demands is a proposal for a network of 'extractive reserves' managed and protected by the *seringueiros* themselves. In them the rubber tappers, Indians and other forest dwellers would be allowed to harvest not only the wild rubber but also the fish, brazil nuts, natural medicines, and other products of the undisturbed forest.

As one of the *seringueiros*' leaders, Jaime da Silva Araujo, put it, "We are green and yellow, the colours of our national flag, rooted in Amazonia and the people best placed to conserve the forest."

The *seringueiros* are descendants of poor European immigrants who colonised the forest in the last quarter of the 19th century. They came to tap the latex from the wild rubber trees for the rubber boom which briefly brought fabulous wealth to

Amazonia. The bubble burst when the British established rubber plantations in S.E. Asia with seeds smuggled out of the Amazon. The *seringueiros* stayed on in the forest, a forgotten people, until now.

Initial contact between rubber tapper and Indian was marked by massacres on both sides, with Indians getting by far the worse of it. Now traditional animosities are being forgotten as *seringueiro* and Indian find common cause in the protection of the forest.

New solidarity

In fact this new solidarity is an acceleration of an historical process: the *seringueiro* has learnt from the Indian how to unlock the treasures of the forest without destroying it. For example, as with the Indian, it is taboo for the rubber tapper to hunt animals with young.

The first test of the *seringueiros*' political muscle will be in Acre, a remote Amazonian state adjoining the Bolivian border. In Acre the mood is militant. The *seringueiros* in Acre are determined that the destruction of the forest in neighbouring Rondonia which displaced an estimated 15,000 rubber tapper families will not be allowed to happen in their state, a vital watershed area for the whole Basin.

Under a World Bank-financed US\$1.6 billion scheme, three million hectares of forest in Rondonia were cleared in

Rubber tapper family prepares midday meal.

Photo: Lamb.



Mushrooming awareness of the plight of tropical forests is giving rise to many inventive and bold new approaches at the 'grass roots' of environmental conservation and among long-established institutions which have faced up to the need to restyle their attitudes and activities to take account of the urgency of the situation.

seven years. Hundreds of thousands of poor farmers from the south were enticed into Rondonia with the offer of free plots of land. At current rates, Rondonia — a state the size of the Federal Republic of Germany — will have no forest left by 1990.

The all-weather road, the BR 364, which made the colonisation possible is now being extended into Acre. The rubber tappers are not opposed to the road but they are angry that no attempt has been made to consult them. Each *seringueiro* family needs 200-300 hectares to make a living from the forest: the authorities are offering them 50 hectares and no guarantee of security of tenure.

An American Chipko?

In Brasilia, Maria Helena Allegretti of the Institute of Socio-Economic Studies, a human rights lobbying group, is playing a key role in organising the rubber tappers' national movement. Allegretti complains that no effort has been made to include Amazonians in the plans to develop their region or to assess their direct and indirect contribution to the national economy.

"Urgent research is needed to find out how the rubber tappers could exploit the forest more productively, through denser stands of rubber trees and brazil nuts and through better marketing — absolutely nothing has been done in this direction," says Allegretti. "The conservation groups in the rich countries which seem so concerned about the Amazon should help."

The newly mobilised rubber tappers know only too well that there is a juggernaut of forces ranged against them. But from now on the rubber tappers will themselves be a force to reckon with. They have support in Congress and the Catholic Church and the rural labour unions are backing the Council. Outside organisations like Oxfam are also providing funding. Like the Chipko phenomenon in the Himalayas this is a spontaneous grassroots movement of people in defence of their resource.

Meanwhile in Acre, the *seringueiros* are steeling themselves for the expected invasion of colonists which will follow the completion of the BR 364. Deep in the forest I attended a meeting of 50 *seringueiros*: "Tell them in Brasilia, tell them in the United Nations," said one participant, "we are going to struggle, to fight to defend our trees." □

Robert P. Lamb is Director of TV Trust for the Environment (TVE). He is involved in a ten-year film project covering the fate of Amazonia.



Power Company Sets Pace

Maria Tereza Jorge Padua

IN A BOLD and unprecedented move, the *Companhia Energética de São Paulo* (CESP), has purchased 1650 ha of Brazil's fragmentary Atlantic forest to create a reserve for conservation. The reserve is sited on both sides of the Paranapanema River, on the border of the States of Paraná and São Paulo. CESP is responsible for producing over 40% of the hydroelectric energy in the country, and is the only power company in the world to be a member of IUCN.

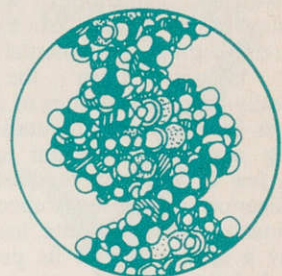
The cost of striking this blow for conservation was high — US\$5.8M — for land prices are high in that part of Brazil. But the board of the Company took the step for excellent reasons. One of its power plants (Rosana, now in its final conclusion phase) will flood around 1,000 ha of the Morro do Diabolo State Reserve, which has a total area of 37,000 hectares. The Golden-rumped Lion Tamarin (*Leontopithecus chrysopygus*), a critically endangered species endemic to the State of São Paulo, exists only in this reserve and in the very small Caitetus State Reserve in the district of Galia, which only covers 1800 hectares.

The Rosana power plant was planned in the 1970s and had the complete approval of former government administrations. Having reached an irreversible stage due to the enormous amount of money spent and to the work accomplished, Rosana will flood altogether 23,000 ha (5000 ha of forested land) to produce 320 MW of hydro power.

Study of the environmental, social and economic impacts of the plant started in 1978 and a report dealing with environmental monitoring and multiple use was produced. Care is being taken to conserve the area's biological resources, through measures to relocate the fauna, establish protected areas and reserves and conserve endangered species. Ecological conditions along lake borders will be restored to protect critical areas vulnerable to erosion and silting. Other safeguards guarantee water quality, protect fish populations in reservoirs and preserve the archaeological heritage.

The example set by CESP is likely to be followed by other power companies in Brazil; the Brazilian public is now highly aware of the negative ecological effects of dam construction, and is exerting political pressure on decision makers to neutralise the environmental impact of big state-funded projects. □

IUCN Regional Councillor M.T. Jorge Padua is former Secretary General of the Brazilian Institute for Forest Development and currently heads the CESP office in Brasilia. She has been at the forefront of battles to ensure the conservation and sustainable management of the Amazon forests.



Botanic Gardens ancient tradition, new challenge

Peter Raven directs the Missouri Botanical Garden, USA, a leading centre for tropical botany and a strong supporter of many conservation projects in the tropics. He chairs the IUCN/WWF Plants Advisory Committee.

Speaking during last November's Las Palmas Conference on *Botanic Gardens and the World Conservation Strategy* (see page 6 of this issue), Raven pinpointed ways in which these time-honoured institutions could rise to the urgent present-day challenge of plant extinctions in tropical forests, the world's largest and richest yet most vulnerable storehouses of plant genetic materials.

"Tropical forest destruction is linked, above all, to poverty and to lack of knowledge," said Raven. "Millions of people must use the forest resource to survive but the tragedy is, once they've used it there's nothing left in future for them to use again. Management knowledge just isn't there. So when we talk about a part for Botanic Gardens in the effort to conserve tropical plants we have to remember that anything we try to do will only work under the appropriate social circumstances, with easing poverty by promoting management awareness, uppermost among our targets."

With 80,000 species to choose from in the Amazon Basin alone, it's obvious Botanic Gardens can't take more than a tiny fraction of the world's plant life under their care and protection. Raven feels there are obvious candidates; legumes are among the world's most economically important plant groups but only about 100 species are presently domesticated. Three to four thousand legume species in the wild are threatened with extinction over the next several decades. "It seems only prudent to start banking as many of these as possible," says Raven.

"In the last analysis, anything we can select from the wild and bring into cultivation is a step back from catastrophe. Though the total contribution of Botanic Gardens to conservation may be small in the light of the overall problem, it can be highly significant." □

Expeditionary Force

GENERAL KNOWLEDGE tends to associate expeditions with the showpiece heroics of European adventurers during the colonial era in tropical history. Even the more scientifically-based expeditions of more recent times have a patchy reputation. The collecting mania of museum specimen hunters, few of whom in the past sensed any obligation to conserve species and populations in their living state, has knocked many a species out of its precarious ecological niche.

Changing scene

But this scene is now changing fast. Rather than smash-and-grab raids on the natural riches of far-off territories, expeditions in the tropics are more and more becoming 'mobile resource centres' organised in the closest possible association with national and local authorities, agencies and citizens' groups in the countries concerned. And conservation is fast becoming their primary goal.

Among IUCN member organisations there exist many illustrations of this new kind of expeditionary force as it is now being applied to tropical forest management studies. Two examples involving NGO members in a tropical and in a temperate country typify this new style of operation.

At least toucan play

Ecuador's *Fundación Natura* (Cuenca) will work during 1986 with the City University of Cuenca, the Católica University, the National Polytechnic in Quito and visiting field biologists from several temperate countries, to establish a biological database for the Rio Mazan forest reserve. The Rio Mazan basin is home to many rare plant species and its animal wildlife includes condors, the Mountain Toucan, pumas and a scarce deer (*Mazana rufina*).

The expedition survey that will help load the database has an even more important aim — to produce a draft management plan for the forest. A Visitor Information Centre is planned for the area and the expedition crew will also help set up exhibitions there and discuss their work with reserve visitors and local people. And all this with minimum disturbance of plant and animal populations and their complex habitats.

When 'the caravan moves on' after the expedition's work is finished, the Ecuadorian partners in the venture will continue to work in the area and everything should be in place for a tremendously improved level of park management on their part.

Roving research institute

The Royal Geographical Society (UK) is one of Europe's most venerable scientific institutions. Its history of expedition sponsorship stretches over centuries; exploits like Speke's search for the source of the Nile or Scott's for the South Pole are characteristic of the Society's earlier history.



RGS scientist fits radio collar to civet cat, Gunong Mulu.

More recently, RGS has carved out a new kind of niche in the scientific record, as a specialist in scientific expeditions in tropical forest regions. The Gunong Mulu (Sarawak) expedition in the late 1970s and early 1980s provided an unprecedented wealth of detailed information on the area's ecology and genetic resources.

Partnership

A forthcoming project on the 92,000 ha riverine island of Maracá in the Amazon's northernmost headwaters will involve partnership between RGS and the Brazilian Special Secretariat of the Environment. It will provide explicit resource management guidelines based on studies timed for late 1986 and most of 1987.

One of the most experienced teams of European scientists ever to work in Amazonia will link with Brazilian counterparts to form a 40-strong roving research institute charged with studies in forest regeneration, soils, hydrology, medical entomology, land development, ecology and management. The Royal Botanic Gardens of Edinburgh and Kew, UK, will also be closely involved in the expedition's later stages. Apart from highly practical information for general application throughout the region, a crowning achievement of the venture will be a management plan for the island site itself.

Experience

It's a far cry from the bravado of the Victorian explorer, but the long track record of institutions like RGS nevertheless provides a matchless fund of logistical know-how to add to purely scientific expertise.

The ever-increasing resource management component in the expeditions policy of RGS, *Fundación Natura* and similar IUCN member organisations, along with the trend in favour of wholehearted partnership between 'home' and 'away' institutions, signifies no small breakthrough in the struggle to secure a safe future for the world's hard-pressed tropical forests. □

COSTA RICA PUTTING A PRICE TAG ON TREES

DEALING WITH 'just the facts' demands for quantifiable data sometimes leaves conservationists at a loss as to how to make their case. In Costa Rica, IUCN's Conservation for Development Centre, together with partner institution CATIE, is supporting a new project to back up sustainable development arguments with arithmetic.

The project calls for an analysis of the economic value of maintaining one of Costa Rica's forest reserves, the Rio Macho, under permanent forest cover and to compare this with the value of clear-felling all or part of the reserve and converting it to other uses.

Of all Costa Rica's forest reserves, which cover almost 10% of the country, Rio Macho is one of the most economically important. It supplies water to the capital city of San José as well as a significant portion of the country's electricity. In addition, it has the advantage over other reserves of being the one with the highest percentage of public lands, which makes easier the development of an effective management strategy.

The cost-benefit analysis of felling the watershed forest will take into consideration not only the value of hydroelectric power currently generated but also the replacement costs of exploiting other energy sources. Similarly, the value of the x cubic tons of timber and the agricultural lands obtained by clearing such a forest area seems likely to pale beside the enormous costs that would be incurred if an alternative source for San José's drinking water had to be sought.

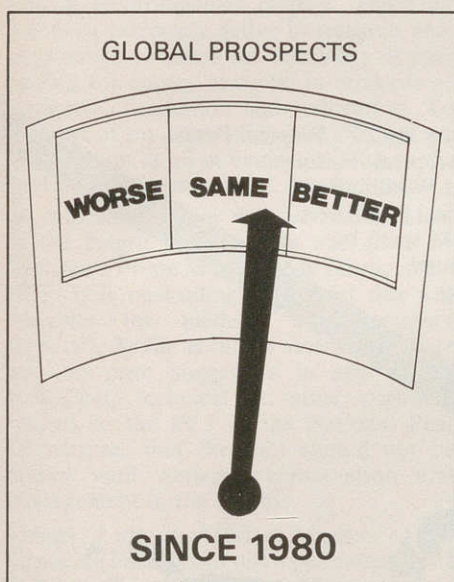
Consumer Boycott

The UK branch of Friends of the Earth (FOE) is piloting a radical approach to trade in tropical timber products at the consumer end.

They are publishing lists of retailers in such products in more than 50 towns and cities in the UK, with details of which forest-derived goods each company stocks. The retailers are being asked to verify that their source of supply is a sustainable and renewably managed forest. Unless the importers who provide the timber cannot provide assurances on this score, each retailer is being asked to refuse to use their products until they do. Retailers who show willingness to enter the spirit of the campaign are to be awarded a seal of approval: consumers are urged not to buy tropical forest products from retailers who do not display such a seal.

Britain is one of the world's largest importers of tropical timber for products like furniture, veneers and speciality goods. FOE claims that at least 95% of all British timber imports from the tropics originate in forests which are being damaged by logging practices not regulated to avoid irreversible environmental damage.

Charles Secrett, the group's Rainforest Coordinator, insists that the campaign is not a bullying tactic. "Most of these traders have no idea of the problems of rainforest destruction and how they contribute to it by stocking the wrong products," he points out. Campaign supporters are briefed to use nothing more than gentle persuasion and the consumer's right to choose what to buy or what not to buy. ☐



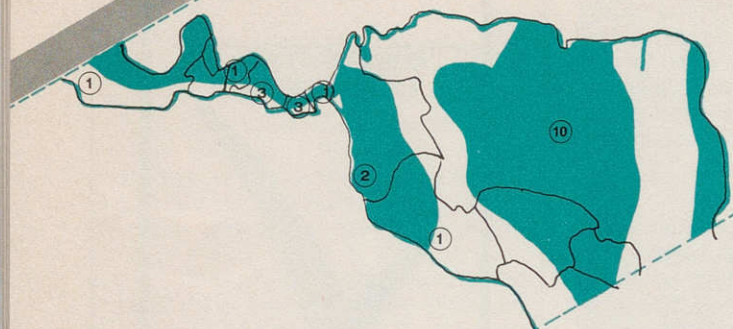
To Sum Up:

On balance, the message of this report is that prospects for the world's tropical forests have changed little since 1980. But signs are becoming more hopeful. A united effort now could change the situation more dramatically for the better over the next five years. But just as there are unknown factors working in favour of conservation, there will certainly be hidden problems to guard against. IUCN's Tropical Forest Conservation Programme aims to keep abreast of positive and negative developments and remain flexible enough to react accordingly. This effort will depend on good first-hand information from conservation achievers everywhere (see overleaf).



Baby orang-utans: Their future is ours too.

Photo: Mittermeier



WHERE THE PROJECTS ARE

Figures on the map locate 70 of the 83 projects in 27 countries which currently make up IUCN's Tropical Forest Conservation Programme. They are superimposed on the approximate distribution of tropical rainforests worldwide. There are also 13 international or regional projects, not shown here. World Wildlife Fund supports more than 60 projects in 22 countries as a result of its highly successful Tropical Rainforest Campaign (launched in 1982), which raised more than US\$2.5 M, supplemented by \$3 M spent by WWF-US on TRF projects. Currently, under the IUCN Programme, WWF has an annual expenditure of about \$1.5 M. The remaining 10 projects in 9 countries are supported by grants made directly to IUCN by aid agencies, government ministries and other partner or member institutions. This support has averaged \$0.4 M a year over the past two years and will increase substantially in 1986.



If you'd like more information about these projects, or if you or your organisation have a special interest in participating in the union programme for tropical forests conservation, contact:

Jeffrey Sayer, Tropical Forest Conservation Programme Office IUCN, Avenue du Mont-Blanc, CH-1196 Gland, Switzerland

LETTERS

Peat mining

Dear Sir,

The article entitled 'Peat Mining in Jamaica' (*Bulletin* vol. 16, p. 123) contains several inaccurate statements, resulting from condensation of the original manuscript, which require correcting:

- the Petroleum Corporation of Jamaica (PCJ) was established in 1979 and not in 1969;

- peat mining for energy may eventually produce a single large lake but initially there would probably be a series of small lakes;

- the PCJ does *not* have a poor track record of environmental concern. The Environmental Unit of the PCJ, under the direction of Dr Barry Wade, a member of IUCN's Commission on Ecology, has undertaken a firm commitment to maintaining environmental quality. The Unit has been extremely active in research projects aimed to assess the feasibility of peat mining for energy and also in methods of wetland conservation and restoration. To the best of my knowledge, the PCJ has no involvement at all in bauxite mining or the environmental impacts of that industry.

- responsibility for wetland management in the Negril Morass *only* was given by Jamaica's Prime Minister, Mr Seaga, to the PCJ. It is misleading to suggest this was "despite the plethora of cautionary reports". As far as can be ascertained there was no prior suggestion in any of the ecological, technical or other pertinent reports to the PCJ or the National Peat Committee, that the PCJ should not be tasked with wetlands conservation and management in the Morass.

Finally, I am an Affiliate Member of the Graduate Faculty but not a permanent staff member of Louisiana State University.

Dr E. Maltby

Department of Geography, University of Exeter, UK

Border dispute?

Dear Sir,

I have just finished reading James Thorsell's fine article on borderline parks. I must take exception to your omission of any mention of one international park, perhaps the only park in the world that is actually managed internationally, Campobello, New Brunswick and Lubec, Maine. It happens to be at map site three on your map, although your article identifies that site as Glacier/Waterton.

You state that there is no case where true joint operations of adjoining parks exists, and that is technically correct, but Campobello is a case of a border park that enjoys true joint operation. I'm surprised a Canadian parks man would miss that one. As a native of Lubec, I didn't!

E.U. Curtis Bohlen

Senior Vice President, World Wildlife Fund, Washington, DC, USA

Dugongs: credit due

Dear Sir,

In reference to the article on the status of the dugong which was published in the September *Bulletin*: the form and presentation of the article is appreciated, but the article should be attributed to Claudia Baldwin who undertook the vast majority of the preparatory work.

R. Kenchington

Townsville, Australia

61st Meeting, Species Survival Commission (SSC)

11-13 October 1986,

Soesterberg
(near Utrecht),
Netherlands

Everyone welcome!

Contact the SSC Executive
Office at the masthead
address for details

Corrections

A report in our June 1985 issue about the Task Force meeting under the Ramsar Convention states wrongly that the meeting's venue was Paris, France: it was in fact The Hague, Netherlands. Information about this and other Ramsar developments contained in an article by Daniel Navid in the December 1985 issue also contained impressive errors, through no fault of the author: the order of paragraphs was transposed at typesetting stage.

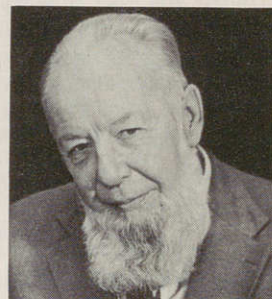
The article in the December issue by Rabbi John G. Spiro and Nick Carter on a Progressive Jewish world view of conservation, refers to the year: "250 before the common year". It should read: "...before the common era."

Photo credits missing from the special Wetlands report in the December issue were: Page 115, photos 2 and 4 WWF/Patrick Dugan; Page 116, photo 2 WWF/Patrick Dugan; Page 117, photo 5 Alain Compost; Page 118 photo 1 WWF/Chris Huxley, photo 4 WWF. All other photos by Edward Maltby.

OBITUARIES



Jean Delacour



Andrei Bannikov

JEAN DELACOUR

JEAN DELACOUR, the French-born ornithologist, died 5 November 1985 in Los Angeles at the age of 95.

He once owned the world's largest private zoo and aviary at his 12th-century ancestral estates in Normandy but the Nazis bombed the castle during their invasion of France in World War II. After the war he went to America where he worked as a technical adviser to the Bronx Zoo and later as director of the Los Angeles County Museum.

He was the author of four major books and many articles in scientific and popular publications and was one of the world's foremost aviculturalists.

ANDREI BANNIKOV

IUCN has learned of the death of zoologist and conservationist, Professor ANDREI BANNIKOV on 17 October 1985. Dr Bannikov was born 24 April 1915 in Moscow and graduated from Moscow University. His doctoral thesis, *Mammals of the Mongolian Peoples' Republic*, was awarded the prize of the Moscow Society of Nature Research. For his services the Government of Mongolia awarded him the Order of the North Star and two medals.

In 1960 he headed the Department of Zoology and Conservation of Nature at the Moscow Veterinary Academy. He wrote some 400 scientific and popular scientific works, mostly about birds.

In 1961 he was elected a member of the SSC and in 1963 headed the IUCN working group on wild horses. He was the author of a number of articles for the IUCN Red Data Book and the main initiator and one of the authors of the Red Data Book of the USSR.

Dr Bannikov was the first Soviet scientist to be elected a vice president of the IUCN, a position he held for six years. In 1981 he was named an Honorary Member of IUCN after previously being awarded the Gold Medal of the WWF (1972) and in 1978 the European Goethe Prize. The following year he was awarded the Golden Ark.

The Soviet Government awarded him the Order of the Red Banner, the Order of the Patriotic War and medals of the USSR.

Making the most of Zambia's resources

Like the baobab tree which is its emblem, the new National Conservation Strategy (NCS) for Zambia promises to be a sturdy trunk from which many nourishing fruits will spring.

APPROVED BY the government in mid-1985 and published in February of this year, the document was produced under the leadership of the Zambian Ministry of Lands and Natural Resources, with technical assistance provided by IUCN's Conservation for Development Centre (CDC).

The Zambia NCS grew out of discussions between His Excellency the President, Dr K.D. Kaunda, and IUCN in 1980, the year the *World Conservation Strategy* was published. Launched as a national project, with funding from the Swedish and Dutch governments, it represents the work of a wide range of contributors, including a team of 40 experts under the chairmanship of the National Council for Scientific Research; non-governmental organisations such as the Wildlife Conservation Society; the United National Independence Party; and many government ministries.

Its publication comes at a crucial time in Zambia's development. Recognising that the nation has relied too greatly on foreign exchange earned from copper exports (Zambia has roughly 6% of the world's proven reserves and ranks fifth in production), the government has changed its development emphasis from mining to agriculture.

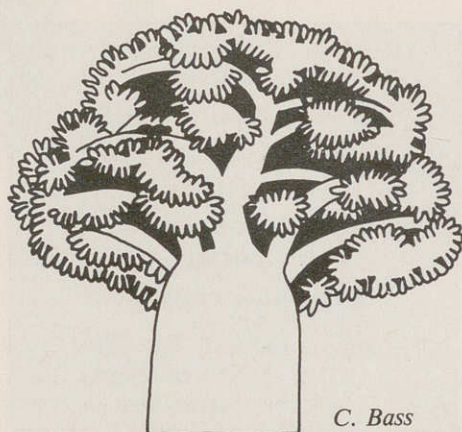
As the NCS notes, this change has important consequences for Zambia's environment. First, new lands are being opened up and current cultivation intensified. Second, soil and water, the resources upon which agriculture depends, are, in the words of the NCS, "renewable if conserved and destructible if not".

The new NCS document on Zambia describes the country's abundant resources; details ill-planned development activities which have resulted in deforestation, soil erosion, the degradation of traditional pastures, pollution, and poaching; summarises current constraints to conservation, and outlines requirements for action.

Action based on the strategy is already under way. With financial help from the Swedish Government, IUCN is continuing to provide material as well as technical assistance. Several projects recognised as priorities in the document are getting off the ground. These include fuelwood and fruit tree planting in urban areas and a WWF/IUCN effort involving the sustainable harvesting of antelope in important wetlands like Bangweulu Basin and the Kafue Flats.

Wetland wisdom

According to IUCN Wetlands Officer Patrick Dugan, who visited Zambia in January, such projects, done by and for the local people, not only stem from the Strategy but also generate support for its



acceptance. Proper management of Zambia's widely dispersed wetland is not possible under the piecemeal approach employed by conventional land-use planning, says Dugan. The antelope harvesting

project provides: "the people with tangible proof of the benefits of keeping the wetlands in their natural condition."

The Zambian people are key to the strategy in more ways than one, its purpose being better development and not preservation unallied to the provision of the needs of people. Education and community participation are stressed, with a series of posters illustrating the country's resources constituting an integral part of the strategy. A new consciousness is already evident from decision-makers down to the teenager wearing a T-shirt with the caption: "Wildlife earns foreign exchange."

At the Ministry of Lands and Natural Resources, a National Conservation Committee and Secretariat have been set up to carry on the work of the Strategy. "The ultimate aim of the Strategy", declared the Ministry in a recent statement, "is to bring conservation into our daily lives. In this way we shall be able to restore the balance of nature in the development process, so that development will bring out the true value of natural resources and no longer harm them." □



H.E. The President Dr K.D. Kaunda takes the lead in advancing a tree-planting project.

Photo: Zambia Information Service

ABOUT GEOSCOPE: this regular feature section will look at

- ☐ global trends in politics and economics and what they mean for conservation
- ☐ typical conservation field projects managed or supervised by IUCN or programmes (Focus on Fieldwork)
- ☐ the spectrum of existing conservation activities in countries embarking on National Conservation Strategies.

GEOSCOPE partly takes the place of the *WCS In Action* supplement, which will from now on be produced separately as an annual review.

SUSAN DRAKE, who writes for *Newsday*, *Newsweek* and *The Christian Science Monitor* from Switzerland, compiles GEOSCOPE.

New Ways to Pay Old Debts

As developed and developing nations alike attempt to come to terms with the debt crisis, it is sometimes difficult to sort the good news from the bad.

IN BRAZIL, alcohol distilled from manioc is providing an energy alternative to imported oil. However, plantation-style cultivation of the plant is causing severe soil erosion and sedimentation problems for vital waterways.

Hoping to compensate for plunging petroleum prices, oil-exporting Ecuador has launched an ambitious exploration programme with the expectation of doubling its known reserves — and production — by 1989. The downside? More than half of the 10 million acres to be explored and potentially exploited are in the ecologically-fragile Amazon region.

Eye witness

Many more examples of this type of development in the wake of the debt crisis were witnessed first-hand by IUCN Director General Kenton Miller on a recent seven-nation South American tour.

He gave as one instance the use of mercury as a solvent by gold miners in open-cast workings in the headwaters of major tributaries of the Amazon. He also recalled flying over the Peruvian Amazon in a sky blackened by smoke from fires set to clear away the vegetation. "It was so smoky you had to fly on instruments and there was not a cloud in the sky", says licenced pilot Miller. These observations — and talks with resource management officials whose budgets and staffs have been the target of debt-driven austerity measures — led him to a single, chilling conclusion: "With what shall the debt be paid? I fear that the answer is renewable natural resources.

"And as you take the forests off to pay the bills," he adds, "a new debt is being created."

Cause and effect

Robert Repetto, Senior Economist with World Resources Institute, a policy research center based in Washington, DC, questions the assumption that the net effect of the debt crisis on the environment is a negative one. "It's not crystal-clear what the effects of the debt crisis are," says Repetto. "Yes, the fledgling environmental agencies are having their budgets cut. But so are the departments of public works, the ones who are building the roads and dams." What is needed, he says, is a careful study to see if, in fact, the conversion of natural resources for export purposes has accelerated during the 1980s.

The new austerity occasioned by the debt crisis has certainly altered the way developing nations conduct policy, says Mark Halle, manager of IUCN's Conservation

for Development Centre. "The crisis is distorting the balance of decision-making in these countries," says Halle. "Far from making a rational decision on what makes the most sense in the long term, they are in many cases doing what needs to be done to meet the next interest payment." He points out that the obligation of a country to earn foreign exchange can be a major if not the major determinant in deciding between options for resource management and use.

In a paper prepared last year for the Joint ECLAC/UNEP Unit on Development and Environment, Osvaldo Sunkel acknowledged that: "the crisis is inducing a backward trend in the relative priority of environmental concerns while, at the same time, generating an increased pressure on natural resources and the environment".

Poverty comeback

This pressure, notes Sunkel, comes not just from large-scale development schemes but also from individuals whose only resource is the land. "An overwhelming increase in the levels of poverty triggered by the recession... has meant an increase in the over-exploitation of land," writes Sunkel. "Well-known phenomena such as deforestation, erosion, desertification, ecosystem degradation, exhaustion of the soils, sedimentation of water basins, loss of flora and fauna and so on, will accelerate."

The potential consequences for the environment are so great that individuals and institutions concerned with sustainable development are becoming increasingly vocal in the dialogue over whether and how the debt should be paid.

"We may come to the conclusion that it is in a country's best interests, in the interests of its long-term stability, to default in the short term," says Halle. "If they are not to default, the northern countries must come up with some creative solutions."

"It may be", says IUCN Director General Miller, "that the cheapest thing for everybody concerned would be to write off the debt."

Thomas Lovejoy, Vice-President for Science for World Wildlife Fund-US, has suggested that the lending nations could give credits to debtor countries for conservation efforts they stand to benefit from.

WRI's Repetto says conservationists should lobby for conditions on any new non-project-related lending that would force developing countries to put a realistic price on resources. If they did, says Repetto: "the governments would get more revenue and the countries would conserve their natural resources."

World Bank ecologist Robert Goodland notes there is no excuse for a relaxation of environmental safeguards on projects the Bank funds, since those safeguards are almost always locally produced and do not require foreign currency. Goodland further suggests that one way conservationists can help over the long term is to support efforts around the globe to change the way nations calculate their national income accounts. Those accounts, says Goodland, should reflect: "one-time draw-down on depletable stocks like fish and forests."

UNEP's Sunkel counsels policy makers to "look at the crisis as an opportunity ... to mobilise resources in such a way that it involves a change of the growth style, aimed at the satisfaction of the essential needs of the population and with a view to launching a process of sustainable development."

One thing is certain: far from rendering conservation irrelevant, the Latin American debt crisis makes the wise management of renewable resources now, more than ever, a moral and a practical imperative. □



Gold mining in Brazil: a new debt being created?

Photo: WWF/Eliane Dubois

THE INTIMATE connection between conservation and development is dangerously close to a cliché. It is hard to disagree that it is important, but equally hard to find where it has made a practical difference. The *World Conservation Strategy* and National Conservation Strategies provide direction, principles, a broad approach. Last year, IUCN and UNEP set out to develop a complementary initiative at the level of specific national development projects: the dam, forest, irrigation or agricultural scheme.

A major problem identified by IUCN and UNEP is that very few major development projects include, from the outset, environmental considerations. Environmental issues tend to be brought in later, after feasibility studies have been completed, and usually by way of an environmental impact assessment. If modifications are then required, they are likely to be seen as increasing project costs or decreasing benefits. And, should project costs increase or funding be reduced, environmental considerations are likely to go: last in, first out.

Surely we can build environmental considerations into a project so integrally and so early on that the economic benefits would be compelling and self-evident. Environmental conservation would then contribute to development, and *vice-versa*, at the project level.

The year-long effort by IUCN's Conservation and Development Centre and UNEP's Commission on Environment and Development to demonstrate how this can be done is now producing results. National consultants in four countries — Costa Rica, Fiji, Pakistan, and Zimbabwe — have developed specific project proposals.

Fiji



The focus is on integrated land-use planning for the Navua River basin. The basin relies heavily on agriculture, forestry and tourism; it also contains the largest projected irrigation scheme in the country. Yet many uncoordinated developments are threatening the natural resources on which that development depends and incurring long-term costs. Deforestation is a particular concern, but many other serious and costly environmental problems are evident. Economic incentives for conservation have not been defined and therefore are not appreciated.

It is important, therefore, to find an 'entry point' for conservation in Fiji — a grass-roots demonstration of the economic benefits of long-term natural resource management to run parallel to the National Conservation Strategy expected to begin shortly.

Consultant Tevite Ba, with support from staff of the University of the South Pacific, has prepared an analysis and project which aims to develop the data and mechanisms for land-use planning through sectoral studies and workshops.

Pakistan



Interest centres on a cluster of development projects on the Korangi Creek near Karachi. More development, including a new fish harbour and export processing zone, is planned. The area's natural resource base — the mangroves and tidal swamps — are enormously rich, supporting important commercial and artisanal fishing as well as providing a wide range of environmental goods. Beyond the creek system the Indus Delta mangroves are a rich resource poorly surveyed, for which long-term management is urgently required.

A proposal by IUCN and WWF representative Aban Kabraji to bring together many different national agencies to monitor pollution and improve the living standard of communities around the creek was well received at a national workshop in Karachi last year. Subsequent phases of the project will develop a management plan for the creek, extend the natural resources survey to the Delta, and develop a management plan for the Delta.

PUTTING LIFE INTO DEVELOPMENT

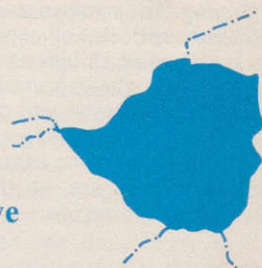
Costa Rica



The goal here is to incorporate environmental considerations into the country's — and the region's — largest irrigation project. Between 1974 and 1982 the principal works of the major Arenal-Corobici hydroelectric scheme were completed, involving the diversion of large quantities of water from the Atlantic Region to the drier Pacific Northwest. A new national irrigation organisation, SENARA, was mandated to develop the agriculture and livestock potential in the Arenal-Tempisque project area. A pilot irrigation project is in place.

Funding for the second five-year stage of the project is now under discussion, offering a good opportunity to implement anticipatory environmental planning. A wide range of recommendations was made, particularly in the areas of impact assessment, land-use planning, watershed management, public health, data services, and organisational support. Proposals put forward by Claudio Gutierrez, Oscar Lucke, and Raúl Solorzano at the *Centro Agronómico Tropical de Investigación y Enseñanza* (CATIE), IUCN's associate institution, have been included in a larger overview report to SENARA and have been well received.

Zimbabwe



The aim is to bring community-based land use planning, erosion control, and agroforestry to the critical and seriously eroded Save catchment.

Irrigation development in the Save basin is key to Zimbabwe's national development strategy. However, two related stumbling blocks stand in the way. One is that the water yield, while relatively high, is still insufficient for the irrigation of the entire tract of suitable lands, necessitating careful control of the water resources. The other problem is that poor land husbandry in the upper catchment has led to a rate of siltation which precludes the development of the reservoirs that are required to store the runoff. Plans to develop the Chisumbanje irrigation scheme on the lower Save River into one of Africa's largest smallholder irrigation projects have therefore been frustrated.

Apart from these hindrances, the degradation of the peasant farming areas of the upper catchment has led to an imbalance between food production and consumption. Unless effective action is taken to restore ecological stability, the degradation will worsen as the population increases. The ultimate objective, then, of the strategy for development in the upper catchment is to maintain the human population in low-rainfall years, at minimum levels of energy expenditure, without degrading renewable resources.

An IUCN project developed by Species Survival Commission member Raoul du Toit in association with the Agricultural and Rural Development Authority should help Zimbabwe meet this objective.

Feedback from the development phases of each of these projects was analysed in a week-long international workshop at Morges, Switzerland, last December. Guidelines for incorporating conservation principles into development projects were also presented. These guidelines are now under review, with the goal of publishing them together with the four country analytical papers later this year. □

Keith Rennie

Institution-Building in Gambia: MISSION POSSIBLE!

AT FIRST glance, the job description of the Environmental Unit of the Gambian Ministry of Water Resources and the Environment would appear to be outside the realm of the possible. A list of its tasks (see below) runs far longer than its personnel roster, which has consisted of just two people with meagre secretarial support. But a new IUCN project now underway aims to help the unit become the catalyst for sustainable development in the Gambia within a few years.

Recognising the need to address environmental issues as part of its national socio-economic development, the Gambian government created the unit in 1982. Lacking the wherewithal to fund it adequately, the Gambia turned to the international aid community for help. Last year, the Norwegian government agreed to sponsor a three-year effort to strengthen the unit and IUCN was brought in to manage the project.

An IUCN mission headed by Pierre Portas, CDC's Coordinator for African Affairs, visited the Gambia in January of this year to discuss with the government the profile and role of the unit and to agree on a workplan. A number of key decisions were taken during the stay of the mission on the actions to be implemented in the first half of 1986. They concerned:

- the initiation of a National Environmental Inventory oriented toward problem solving to begin in March 1986;
- the recruitment of a VSO officer to begin working on the educational aspects of the project; and
- the establishment of a National Documentation Centre.

The Gambia's environmental problems are of two kinds: current problems caused

by increased pressure on the land from growing human and livestock populations and potential problems linked to proposals to use Gambia River water for irrigation.

During the next two years, the unit will develop educational and public information programmes, establish a National Documentation Centre, build up an Environmental Impact Assessment capability and cultivate many other baseline services to cater to specific needs.

"What is very interesting", says CDC's Portas, "is that the purpose of that unit is a bit like UNEP within the UN system: it is entrusted with being the coordinator of environmental action for the whole government and also providing advice to different ministries when they have projects which have a bearing or impact on the environment."

"For IUCN it is very important because the principal focus is on institution-building, which offers promise of ensuring long-term results. It is also a big challenge because the Gambia has little in the way of funds or trained people to allocate to such a unit."

"Also, if the Unit wants to have credibility *vis-à-vis* its own Government — to be able to say you can count on us, we can give you good advice, we can hire the right experts for your project — and also have credibility *vis-à-vis* the international community, it must move quickly to do so in about two years or even less."

Portas expects the institution-building process to be further strengthened once the Gambian government has endorsed the National Environmental Management Act drafted last year with the assistance of UNEP.

He cautions against assuming that because the Gambia is a small country, change can be implemented more easily or more quickly. How successful the Environmental Unit is, says Portas, will ultimately depend on two factors: the extent to which there is sufficient political will at the highest levels of government and the calibre of people who run the unit. □

IN OUR NEXT ISSUE

MESSAGE FROM OTTAWA an on-the-spot report from the Ottawa Conference on Sustainable Development *Implementing the World Conservation Strategy*

From 30 May to June 6, specialists and commentators from all over the world will assemble in Ottawa, Canada, to review what has really happened since this historic consensus was achieved in 1980 and to ask: Where do we go from here?

A *Bulletin* team will be there to bring their views home to the IUCN network

WORK OPPORTUNITIES

EXECUTIVE OFFICER, SPECIES SURVIVAL COMMISSION/SWITZERLAND

Job Description: Responsible for support and servicing of IUCN's Species Survival Commission (80+ Specialist Groups, 1500 members), and organising contributions from the Commission to the work of IUCN. Manage a four-person unit and serve as Secretariat expert on species conservation, dealing effectively with leading scientists and senior officials. Attractive benefits, Salary SFr. 80,000-100,000 depending on qualifications.

Qualification: Degree(s) and substantial background in biological sciences and/or extended experience/understanding of application of science to conservation problems, especially in developing countries. Excellent English and communication skills essential, additional language(s) desirable. Post requires mature person well advanced in professional career. Early availability desired.

To Apply: Send CV with availability date and salary requirements before 15 June 1986 to: Director, Programme and Policy Division IUCN, Avenue du Mont-Blanc, 1196 Gland, Switzerland.

Some flexibility of closing
date in view of late
arrival of this *Bulletin*.

PROGRAMME OFFICER, POPULATION AND SUSTAINABLE DEVELOPMENT/ SWITZERLAND

Job Description: Responsible for implementing a new IUCN programme on population and sustainable development, as part of the Secretariat's multidisciplinary team. Will integrate population variable into the substantive work of the Union, including design and supervision of selected field activities and case studies, in countries such as Colombia, Nepal, Indonesia, and Zimbabwe. Candidates from developing countries, and especially women, are particularly encouraged to apply. Attractive benefits; salary SFr. 80,000-100,000, depending on qualifications.

Qualifications: Higher degree and substantial background in population and sustainable development fields. Broad perspective on relationship between population and other development issues, particularly resource use. Excellent English and communications skills essential; additional languages desirable.

To Apply: Send CV with availability date and salary requirements before 15 June 1986 to: Director, Programme and Policy Division IUCN, Avenue du Mont-Blanc, 1196 Gland, Switzerland.

Plants in Danger: What do we Know?

ALL BUT about 12 countries of the developed world have produced Plant Red Data Books or basic lists of their threatened plants. This is one conclusion from a new compendium on what is known about threatened plants worldwide. Published this month by IUCN, it is entitled *Plants in Danger: What do we know?*.

The change is remarkable: in 1970, only Belgium had produced a threatened plant list and Ronald Melville, working alone, was assessing threatened plants on a world scale.

National activities on documenting threatened plants coincide with a period of intense activity by the then IUCN Threatened Plants Committee, which ran from 1974 to the early 1980s, when it re-emerged in the plural as the Plant Specialist Groups of the Species Survival Commission. The Committee team, led by SSC Chairman Grenville Lucas, played a crucial role by providing a focus for botanists concerned about the loss of the flora on which they had worked all their lives. Lucas's energy and enthusiasm was very effective in persuading them to prepare the basic documentation.

So there is now plenty of information on threatened plants. Yet it is also very clear that plant conservation is not succeeding in most parts of the world and is not yet fully accepted as a fundamental part of conservation in general. One reason may simply be that many conservationists do not know how much is already known about threatened flora. This would not be unduly surprising as most efforts to list threatened plants emerged from herbaria and botanic gardens, and many of the results are published in very obscure places.

The *Plants in Danger* book is designed to address this problem and so contribute to one of the prime objectives of the IUCN and WWF Plants Conservation Programmes. Rather than list or describe every threatened plant, which would be impossible in one book anyway, it provides concise data information on where the reader may find that information. The entries are arranged alphabetically by country, so as to answer the question "Where can I find out about the flora of the country, which species in that flora are threatened, and who is trying to save them?" Each country entry is arranged under subheadings, rather like a Red Data Sheet.

Change of emphasis

The book marks a changing emphasis in the work of the Threatened Plants Unit of IUCN's Conservation Monitoring Centre. In the early days, the unit prepared threatened plant lists of various regions — Europe, North Africa, Central America — working from Flora and Monographs in each case. In 1978 they produced a global Plant Red Data Book, giving case histories on 250 selected threatened plants from around the world.

Today, the emphasis is on helping botanists prepare national Red Data Books for their own flora and keeping track of

Hugh Syngé

them. The result is the TPU database, held on computer, of which the *Plants in Danger* book forms an essential component. The database is emerging as a global overview of our knowledge of the decline of plant diversity worldwide, designed to answer the questions that cannot be answered at national level.

Many national Red Data Books, such as that for Australia, are now in their second or third edition as they continue to be refined and recorded. The challenge now is to help and encourage teams of botanists to convert their national Red Data Books into national plant conservation databases. These may emerge as part of national conservation databases or as entities in their own right though working closely with other conservation databases, like those on fauna. Such databases will be able to answer many of the questions posed and with a far higher degree of resolution than IUCN could provide in one Centre. They also serve as an ideal focus for institution-building and training.

State of knowledge

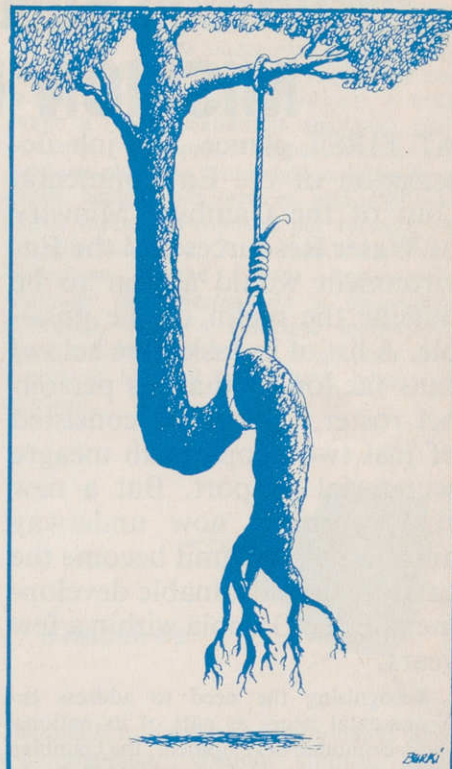
So what do we know from all this information? First, 15,870 different kinds of plants are recorded as rare or threatened worldwide, if we accept the IUCN Red Data Book categories as criteria for the degree of threat. This total will rise to some 18,000-20,000 as a few remaining threatened plant lists, discovered in writing the book, are screened for additions to the database.

Most of these plants are from temperate countries and from islands. However, it is well known that about two-thirds of the world's plants are tropical and that the threats to vegetation are most acute in the tropics also.

The reason is that for much of the tropics, the plant species are not yet known in sufficient detail to determine which species are threatened and which are not. The IUCN and WWF Plants Advisory Group, meeting recently in Las Palmas, agreed that: "at least 60,000 plant species could become extinct in the next 30-40 years if present trends continue". This is a truly horrifying estimate — about one in four of the world's remaining plant species!

Information vacuum

The *Plants in Danger* book opens with two maps of the world. One shows, by bar charts, the approximate size of the flora of every country in the world. The other shows the extent of knowledge on threatened flora, also for each country. Comparing



© 24 Heures

the two shows the startling contrast: most of our knowledge is about the countries with least plants.

Truly creative efforts are needed to redress and overcome this massive imbalance. The Threatened Plant Unit's (TPU) approach has been to start work on a Directory of Plant Sites, predominantly tropical, where most plants could be saved. If we cannot identify each species in danger, surely we can identify those places richest in plant diversity and now under threat. Drawing together the information for the Sites Book is not easy, but, with the help and advice of the Plant Advisory Group and of botanists in the key areas, we are convinced it can be done.

At the country level, preparing indexes of Key Sites for protection is quite possible and can develop into a more general assessment of the mosaic of plant endemism and diversity compared with the vegetation that remains and that can be saved. Again, national databases are surely the best way to approach this problem.

So where will we be another fifteen years on? Will the boom in National Red Data Books be translated into a worldwide network of national conservation databases, all interacting with each other, with IUCN and other relevant organisations? Will the botanical institutions have prepared for us a database on the plants of the world as the cornerstone of our programme? Will we have an accurate assessment of the mosaic of plant endemism and diversity, available at the touch of a button from a computerised Geographic Information System (GIS), to compare with the regular Landsat images that plot the decline in habitats and vegetation?

None of these goals are easy but I believe all are possible. Only time will tell how far we get before it is too late. The quicker it can be done, the fewer plants will become extinct. □

Swallowtails Threatened

This latest volume in the IUCN Red Data Book series was written by Mark Collins of the IUCN Conservation Monitoring Centre in Cambridge, and Michael Morris, Chairman of the SSC Butterfly Specialist Group. Swallowtail butterflies include some of the world's most beautiful insects, with iridescent colours of every hue and wingspans reaching 25 cm. This is the first worldwide analysis of their conservation needs and in many respects it breaks away from the traditional Red Data Book format.

First of all, a general introduction to the biology, distribution and classification of swallowtails is given, described by one reviewer as "a most valuable overview in its own right". After setting the scene, all 573 species of swallowtail are listed and discussed in terms of distribution and conservation. With entries varying from a few lines to half a page, this section takes up over 90 of the book's 401 pages, but it is proving to be very valuable to entomologists.

The subject of trade is given very full consideration. Research has shown that over 80 per cent of the world's swallowtails are traded on the open market, with prices ranging from a few cents to thousands of dollars. Both good and bad aspects are pinpointed. Sustainable utilisation, such as in the Papua New Guinea birdwing ranching programme, is applauded, but over-collection of, for example, the Endangered *Homerus Swallowtail* in Jamaica, is condemned.

The final third of the book contains the traditional reviews of threatened species. Sixty-one species (10.7 per cent) are described as Endangered, Vulnerable, Rare or Indeterminate, with a further 111 species (19.4 per cent) listed as poorly known or in need of continuing monitoring. Over two-thirds of the threatened species are to be found in just 10 countries. A novel method called "critical faunas analysis" has pinpointed Indonesia, Philippines, China, Brazil, Madagascar, India, Mexico, Taiwan, Malaysia and Papua New Guinea as important focal points for conservation effort.

Finally, the eight full-colour plates depicting 40 threatened species are a refreshing addition to the Red Data Book image. The extraordinary variety of form, pattern and colour is there for all to see, hopefully not for the last time!

See IUCN In Print column for sales details.



A NEW report by the World Resources Institute says that by subsidising pesticide production and sales, many governments of countries in developing regions are encouraging farmers to use chemicals with serious environmental and safety side effects. In addition, the report says, subsidy programmes divert hundreds of millions of dollars annually that could be used to promote safer and better methods of pest control.

In a study of nine developing countries on three continents, researchers found that subsidies range from 15 per cent to 90 per cent of full cost and that the World Bank and the US Agency for International Development are involved.

The report, entitled *Paying the Price — Pesticide Subsidies in Developing Countries* (Research Report No. 2) is critical of USAID. "If AID supplies pesticides free for distribution through commercial channels to countries that maintain heavy subsidies, then AID will undermine, rather

than contribute to sound pest management", says the report. The World Bank is also censured: although it has policy guidelines recognising the risks of excessive reliance on chemicals, it is "silent on these widespread pesticide subsidies; nor have World Bank experts, who extensively analyse the agricultural policies of the Bank's borrowing countries, carried out any systematic investigation of pesticide subsidies and their consequences."

Of the countries surveyed, only Pakistan (which discontinued subsidies in 1980) had analysed the effects of its subsidies and possible alternative ways of promoting pest management. The report says Pakistani farmers are: "more judicious in the choice and use of pesticides, with only effective and less expensive chemicals finding favour with them..." and that wastage has been "considerably reduced" as a direct result of the lack of subsidies.

Paying the Price is available for US\$7.50 (plus US\$4 for overseas postage) from WRI Publications, Box 620, Holmes, PA, USA, 19043-0620.

IUCN IN PRINT

All publications listed in this column can be obtained from IUCN Publications Services, Avenue du Mont-Blanc, CH-1196 Gland, Switzerland, unless otherwise indicated.

Threatened Swallowtail Butterflies of the World

an IUCN Red Data Book

by N.M. Collins and M.G. Morris

See review, opposite. 401 pages. Eight full colour plates. US\$26.00.

1985 United Nations List of National Parks and Protected Areas/Liste des Nations Unies des Parcs Nationaux et des Aires Protégées 1985

Compiled by the IUCN Protected Areas Data Unit (PADU) in collaboration with CNPPA, this indispensable publication, last published in 1982, has now been revised and up-dated. The list includes strict nature reserves, national parks, natural monuments, managed nature reserves, protected landscapes, biosphere reserves, Ramsar sites and World Heritage sites. Summary chapters deal with the biogeographical and ecological coverage of protected areas, rates of growth of the protected area networks, size class frequency. Bilingual edition (English and French). 174 pages. US\$12.00.

A Directory of Crocodilian Farming Operations

by R.A. Luxmoore, J.G. Barzdo, S.R. Broad and D.A. Jones

A joint publication of the IUCN Wildlife Trade Monitoring Unit and the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), this directory was compiled partially to assist in the enforcement of CITES controls by identifying captive breeding operations and to ascertain the extent of farming so that its effects on crocodilian conservation can be assessed. The trilingual introduction summarises CITES regulations governing trade and evaluates arguments for and against farming. Information about operations, listed by country, includes species, numbers, production, trade, breeding and husbandry. Introduction Eng/Fr/Sp. Tables. 204 pages. US\$12.00.

Status of Multilateral Treaties in the Field of Environment and Conservation

IUCN Environmental Policy and Law Occasional Paper No.1. Arranged in a series of fold-out pages, the chart is divided into two sections, the first concerning conventions open to acceptance by States throughout the world and the second dealing with those multilateral conventions which are either regional or restricted in their scope. In both sections, States are organised by regions. The chart derives from research conducted at the IUCN Environmental Law Centre, Bonn, and reflects all data received as of 15 October 1984. It will be updated regularly to reflect changing developments in the field. US\$5.00.

SUDAN

THE ROOTS OF FAMINE



A Report for Oxfam by Nick Cater

Cover: Finding scarce fuel in western Sudan (Oxfam)

"The poor of Sudan starved in 1984, continued to starve in 1985 and will need a lot of help if they are not to starve in 1986."

... but they did not die simply because the rains failed: the roots of Sudan's famine go far wider.

This background brief highlights the economic, political and environmental factors which have brought millions of Sudanese people to the brink of survival. International response to the disaster has been dramatic, but short-term handouts cannot solve the long-term problems — they merely postpone famine's inevitable return.

Sudan: The Roots of Famine argues that understanding the causes of Sudan's current crisis is a vital first step towards preventing the recurrence of the devastating famine of the last three years.

Contents

Climate: A pattern of drought

Water: Blessing and curse

Land: High pressure, diminishing returns

Trees: Fuelling the crisis

Livestock: Too much of a good thing

Tenure: Who owns Sudan?

Credit: A lack of bootstraps?

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A day in the life of a Sudanese woman

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Aid: Big is still beautiful

Conclusion: A future after famine

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