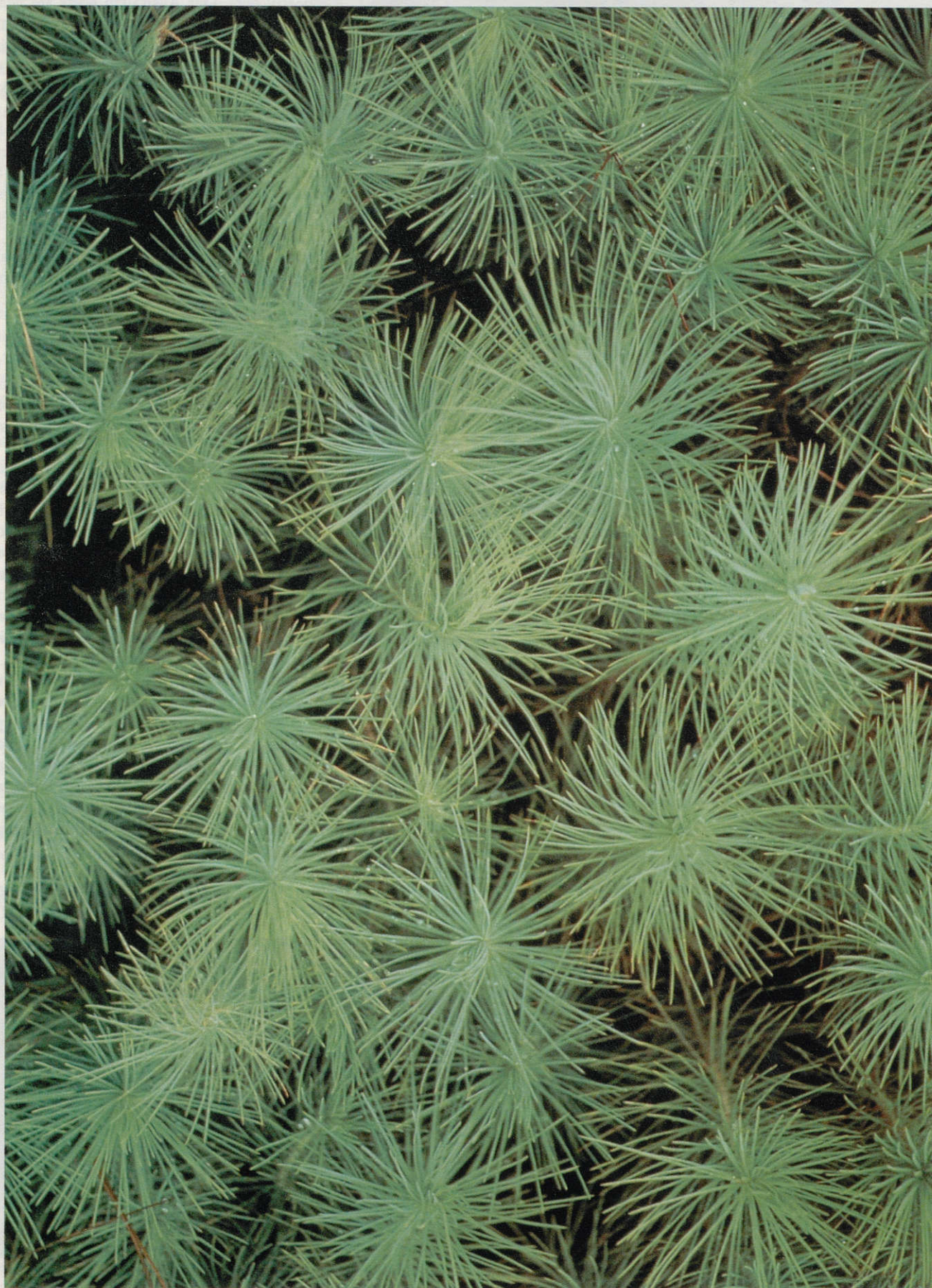


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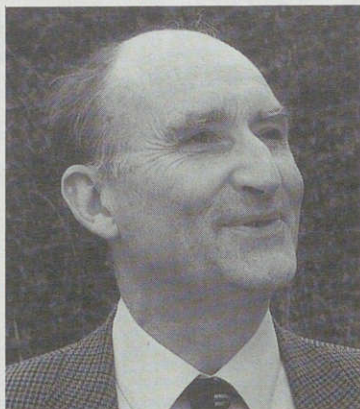
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Cover photograph: Plant power.
Seedlings of the chir pine, a native tree
of Nepal, are used to prepare degraded
land for forest regrowth. See page 13.

Photo: Christine Prescott-Allen
(Animals Animals/Earth Scenes).



Why have a General Assembly?

It's nearly here. Our Australian hosts are nearing the end of immense efforts. The Secretariat are variously frantic or coolly pretending that business proceeds as usual. Two hundred air tickets have been booked for those whom IUCN – thanks to several generous donors – has been able to help with their travel to Perth. Hundreds of hotel rooms have been booked; more than a thousand copies of General Assembly documentation have been despatched. All for five Commission meetings, 12

workshops, 11 plenary sessions, and dozens of associated group gatherings and informal discussions in premises ranging from the bar to the opulent Burswood auditorium.

How can we get value for money from such a palaver? First, by demonstrating that the General Assembly really *is* a World Conservation Congress, that brings together a unique range of professional conservationists and those they serve, and produces sensible, practical output. Second, by taking that output away and doing something useful with it.

What output? Essentially, information. Knowledge of what the balance of wisdom says is the *real* truth behind some of those hotly argued issues. Can tropical forests be used sustainably? What principles and practices should guide the use of wildlife? What is the best way of conserving Antarctica? How can the under-privileged three-quarters of the world industrialize, end crippling poverty, stabilize populations – and retain an environment that's fit to live in? And so on.

These are questions *Caring for the World: A Strategy for Sustainability* – the companion and successor to the World Conservation Strategy – seeks to answer. They are issues that will recur in our formal and informal debates. We will not achieve final and definitive answers. But if we discuss such matters frankly – and in a mood that listens to other arguments as well as states passionately held beliefs – we should move forward. If we can help the world conservation movement to speak with one voice, we will convince far more audiences than any assertive cacophony can ever do.

And then? The follow-up is crucial. The General Assembly is not just a place where IUCN thrashes out its policy and carves up its budget, but a place for renewal. The ideas we gather, the contacts we make or renew, and the commitments we take away, will contribute in significant measure to the human future. If the General Assembly works, none of the participants will be quite the same afterwards. That, at least, should be our hope.

If I may venture a personal note it is this. I have now been Director General for nearly three years. I deeply appreciate the help I have received from many members, and the confidence of the Council in asking me to serve another term. That gives me three more years with IUCN, and that means that the agenda adopted in Perth is my agenda for completing my contribution to the Union. I hope for an agenda that will keep IUCN where it should be – the unquestioned focus for the ideas and visions of the world conservation community, and a powerful instrument for making the visions come true.

I wish us all an enjoyable, and exhausting, ten days!

– Martin W. Holdgate
Director General, IUCN



Products of a renewable harvest: straw mats for sale in Karachi, Pakistan. See page 13.
(photo: WWF/Mauri Rautkari).

Dr Holdgate heads Chinese advisory council

IUCN's Director General Dr Martin Holdgate has agreed to be international co-chairman of a unique initiative in China for action to promote economic development in harmony with the natural environment.

Under the experiment, an International Advisory Council, half of them foreigners, will help guide environmentally sound development in Hainan, an island off the southern coast of China which has been designated the country's biggest Special Economic Zone.

The Council will play a controlling role in guiding the use of certain catalytic funds that may be granted by the United Nations Development Programme and the Asian Development Bank (ADB). With the advice of the Council, the Provincial Government will prepare an annual budget for project development, training and consultancies, and ensure proper reporting of the use made of the funds.

At the same time, the central Chinese authorities are making available large sums to support development. Funds will also be sought for specific projects. The Rockefeller and Ford Foundations have already helped the establishment of the Council. The ADB is developing an overall master plan and has proposals for following this with a water management plan for Hainan.

China's former Minister of Agriculture, He Kang, chairs the International Advisory Council from the Chinese side. Bao Keming, Executive Vice Governor of the Hainan Provincial Government, and Mme Deng Nan, Director of Social Development in the China State Science and Technology Commission, are also members. Professor Hans Peter Duerr of the Werner Heisenberg Institute for Physics, Dr Malcolm Gillis of Duke University, and Professor Gordon T. Goodman of the Stockholm Environment Institute are outside representatives.

Dr Holdgate went to Hainan in September for the Council's first meeting. At the close of discussions, Minister He Kang declared that China stood firm in seeking to make Hainan an experiment leading to a model of economic development in harmony with the environment. He said the Chinese would welcome IUCN's help in starting a biodiversity and nature reserve programme, and they would like to promote practical measures for sustainable development through a new research and training centre.



The Mangrove Nature Reserve of Dong Zhai Gang, Hainan, China.

Monaco conference on large marine ecosystems

A new conceptual framework for the processes governing the ecology of coastal and ocean species – the Large Marine Ecosystem (LME) approach – was the theme of a major international conference held in Monaco on 1-6 October.

Some 150 scientists, managers and diplomats concerned with marine resources attended the conference. The new strategies being developed through the LME approach have a broad application to the ways in which countries manage their Exclusive Economic Zones (EEZ) and in the many regional treaties and action plans for the seas. Large marine ecosystems cover about 200,000 sq km of the world ocean.

Prince Rainier of Monaco opened the conference with a welcoming address. US Undersecretary for Oceans and Atmosphere John Knauss and IUCN Director General, Martin Holdgate, gave the keynote addresses. The meeting was convened and co-sponsored by IUCN in partnership with the US National Oceanic and Atmospheric Administration (NOAA) and other international organizations.

The second day was devoted to regional case studies, while the third day looked at management strategies and applications of technology. These sessions were followed by discussion groups which drew up a report and recommendations, and by workshops. One organized by IUCN's Species

Survival Commission considered setting up an LME Fisheries Management Specialist Group within IUCN. A workshop sponsored by IUCN and the National Marine Fisheries Service (NMFS) of NOAA looked at economic indicators of biomass yields in LMEs.

Caring for the World

Over 2500 copies of the second draft of the World Conservation Strategy for the 1990s, incorporating comments on the earlier version, were distributed for comment during August.

"The response has been amazingly quick," says former IUCN Director General David Munro, who is Project Director. "It has also been encouraging and constructive. There have been so many requests for the draft that an additional print run has been arranged."

The title of this successor to the World Conservation Strategy of 1980 will be *Caring for the World: A Strategy for Sustainability*. It will be the topic of discussion in a workshop at the Perth General Assembly on 30 November and 1 December.

All the other Assembly workshops will allot time to reviewing specific chapters of the new strategy that fall within their mandate. The conclusions will provide the background for deliberations in plenary on Sunday, 2 December. The final text will then be prepared, and the publication will be launched at a number of world centres in late 1991.

Information service launched

A project to create an international environmental and natural resources assessment information service (INTERAISE) is under way. Claire Lindsay of the Union's environmental impact assessment (EIA) service describes its purpose:

"The project has already produced a Directory of Country Environmental Studies which provides a useful guide to environmental assessments and profiles of developing countries. For example, if someone wants information about the natural resources of, say, Botswana, a first step would be to consult the Directory to find out what resource assessment information is available and from what source."

The Directory presents key information about the content and availability of more than 240 studies on environmental and natural resource conditions in the developing world. The aim of the project is to provide a full referral service on national and international resource assessment and environmental information.

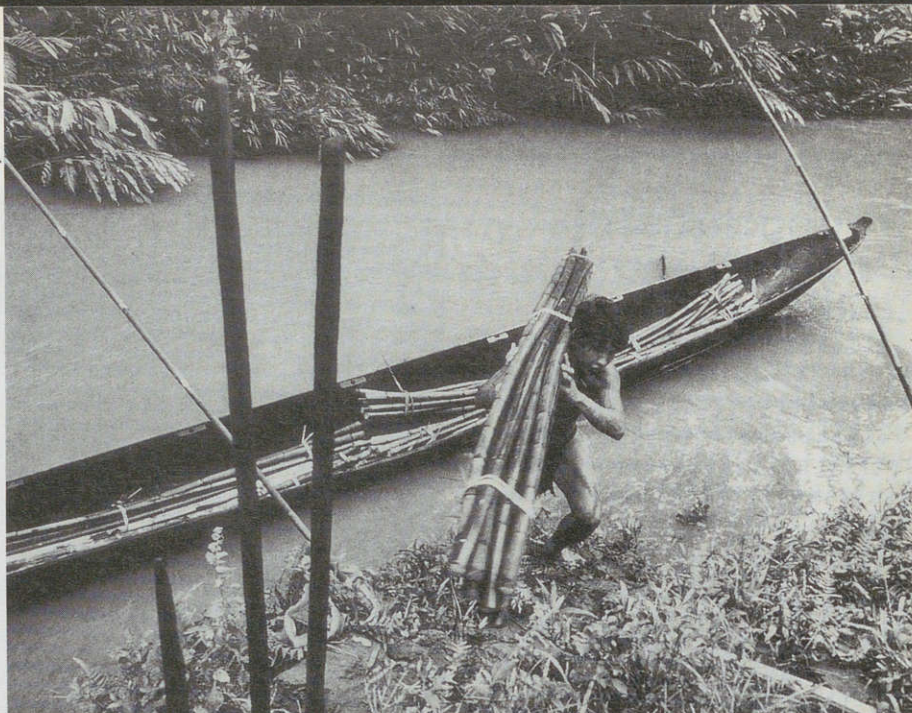
The first edition of the Directory was funded by the US Agency for International Development (USAID) and produced by the World Resources Institute (WRI).

The funding base of the project has been expanded and now with the assistance of several European funding agencies, IUCN is collaborating with WRI and the International Institute for Environment and Development (IIED) to expand the content of the Directory and to assemble libraries of hard copies within each organization: IUCN in Switzerland, WRI in Washington and IIED in London. The Australian International Development Assistance Bureau (AIDAB) in Canberra has contributed to the project and will also hold a full set of documents.

Global change committee meets

The Advisory Committee for the IUCN Global Change Programme held its first meeting in Gland on 6-7 September, and approved a programme of activities which will be discussed by IUCN members at a workshop during the General Assembly.

"What makes IUCN's programme different is that we are not just looking at the impact of predicted climate change on ecosystems," said Danny Elder, Coordinator of the Global Change Programme. "We are also looking closely at the issues of population and natural resources because people are part of the global change issue. Our initial emphasis is going to be on the vulnerability of coastal ecosystems



Recipes for wetland management are not always applicable in developing countries, where people need to solve their own conflicts over resource use. Above: unloading rattan in Indonesia (photo: WWF/J.A. McNeely).

Wetlands conservation: getting specific

IUCN project staff, regional office personnel, advisory committee members and representatives of collaborating institutions gathered in June at a two-day workshop to discuss IUCN's wetlands work.

The meeting, held in Montreux, Switzerland (24-25 June), to help prepare for the subsequent Ramsar Convention conference, was also designed to contribute to two recent IUCN initiatives: a Tidal Wetland Management manual being prepared by Dr Peter Burbridge and Dr Jim Davie, and the Floodplain Management manual currently being discussed with IUCN's members in the Sahel.

A major proposal was for IUCN to establish a wetlands network among non-governmental organizations to put across its message to the grassroots. It would be similar to the Arid Lands network built up by the International Institute for Environment and Development.

"Participants generally agreed that it is wrong to apply generalized recipes for wetland conservation to all situations," reports Jean-Yves Piro, Deputy Coordinator of the IUCN Wetlands Programme. "They felt that the industrialized concept of wetland management as seen in Europe and North America is one which can be applied in certain cases; these might concern, for example, how to cut reedbeds or manage islands for nesting waterbirds. By contrast, this approach is of limited value in developing countries, which face specific conflicts over resource use, and where people need to build their capacity to solve their own problems. This requires the wetland manager to create a collaborative relationship with local communities and government agencies."

The summary report on the workshop suggests that: "Rather than seek to train technicians in the application of specific recipes for wetland management, it may in most instances be more important to communicate a wetland conservation ethic setting out the broad principles of a socially sensitive approach to wetland conservation."

to global change in a joint activity between the Population and Marine Programmes of IUCN."

The Committee includes representatives of major bodies concerned with global change, ranging from the UK Climatic Research Unit at the University of East Anglia to the Secretariat of the United Nations Conference on Environment and Development.

Elaine Dickinson, IUCN Programme Assistant for Global Change, added: "We were very pleased to have leading officers of these other organizations review the objectives and planned activities of our

programme and indicate clearly that they think IUCN has a definite role to play."

The programme paper foresees that IUCN will synthesize existing information and strengthen existing programmes with advice, strategies and guidelines for application by environmental managers and people working in conservation. Activities in the next three years will focus on (1) the impact of global climate change on ecosystems; (2) the impact of population increase and resource consumption as a factor in global change; and (3) inter-relationships between ecosystems and human populations.

Money matters!

This has been a turbulent decade in the Union's finances. The new Development Division being established aims to give IUCN a less bumpy ride during the 1990s.

Back in 1980, things were much simpler. The Secretariat comprised one office – the headquarters – and its income was made up very largely of dues and contributions from WWF and the United Nations system. Excluding the CITES Secretariat and the WWF projects managed by IUCN, the total budget was about SFr4 million. IUCN's finances were managed at that time by the Joint WWF/IUCN Finance Department, which was run by WWF staff.

The year of the New Zealand General Assembly, 1981, was a year of crisis. The World Conservation Strategy had just been launched and as far as could be seen, IUCN had a considerable deficit. The Director General, Lee Talbot, cut the expenditure to a manageable level by reducing staff. This coincided with the birth of IUCN's field operations, known as CDC – the Conservation for Development Centre – which was to grow through the 1980s faster than all other components of IUCN.

By the time of the Madrid General Assembly in 1984, IUCN's finances again appeared to be in a healthy state and a bold budget was approved for the new triennium. Subsequent information and adjustments by the auditors showed that the optimism had been unjustified. The Director General was obliged to cut back again on expenditure.

Early in 1986 IUCN set up its own Finance Unit. By the Costa Rica General Assembly in early 1988, a number of new financial management systems had been



The headquarters-based Finance and Management Services Divisions, which are responsible for management of the Union's finances, represent a real cultural mix. Front row, left to right: Bobby Purewal (India), Heather Morgans (USA), and Line Ramm (Norway). Back row: Francis Parakatil (India), Judith Nechvatal (Scotland), Stewart Jackson (New Zealand), Sue Mills (England), Juan Garafulic (Chile), and Ursula Hiltbrunner (Switzerland). Heather Morgans, IUCN's Comptroller, has headed the Finance Division for the past two years and has been largely responsible for the reorganization of IUCN's accounting systems.

developed and introduced. So, although the picture presented to the General Assembly was not good in terms of the overall core deficit (which had not been projected previously), we had, for the first time in the decade, both a clear picture of the current and projected financial situation and the necessary management tools with which to maintain control.

The incoming Director General faced a major challenge. The Secretariat needed to respond to ever-increasing demands for support from members in many countries of the developing world. It had to respond to the need for its global scientific networks to be better harnessed to face the deteriorating global situation. At the same time the Director General and his staff had to ensure financial security, so that membership and collaborating organizations would start to respect the Union not only for its science and policy work but also for tight and business-like management of its affairs.

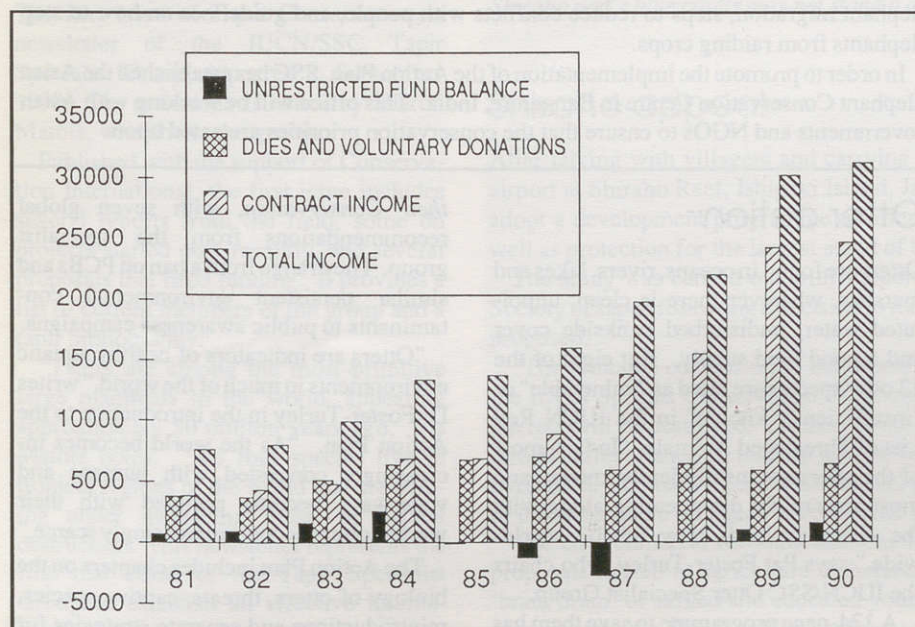
That has been our goal over the past 2 1/2 years and to a very large extent it has been achieved: the growth in Secretariat services has been maintained while the core fund deficit has been eliminated (see graph).

The Secretariat in 1990 is very different from that of 1980. Of a total staff of more than 200, only 80 are based at headquarters, the remainder being divided between 14 regional and national offices and centres throughout the world. As well as ensuring the provision of central secretariat services to members, these various offices are responsible for running more than 300 projects. Financial control is maintained through the combined efforts at headquarters of the Finance and Management Services Divisions working with counterparts in the outposted offices.

But it is particularly difficult to maintain control in the absence of adequate operating reserves, currently at only 4% of the operating budget. It is clear that the Union must both significantly increase its core unrestricted income and start to build-up operating reserves equal to at least 20 per cent of the minimum operational budget. That will be the main task of the new Development Unit, together with ensuring the continued growth of the overall budget to support IUCN's increasing contribution to global conservation.

The 1990s promise to be the most challenging decade in IUCN's history because of accelerating environmental degradation, the crescendo of public interest in the environment and the overall worsening of the global economic climate. Ensuring the Union's solid financial base will continue to be a major priority for the Director General through the 1990s.

*– Michael Cockerell,
Director of Administration
and Management*



Progression in IUCN Income and Unrestricted Fund Balance, 1981-90 (SFr X 1000).

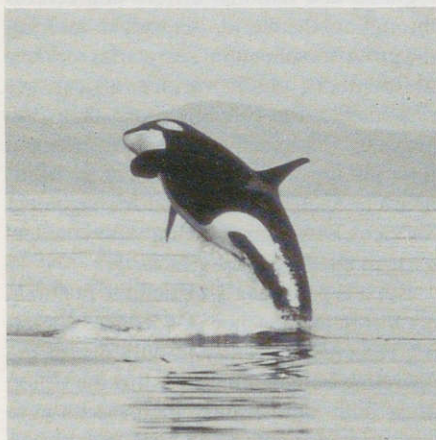
Species Survival Commission (SSC)

Hope for small whales?

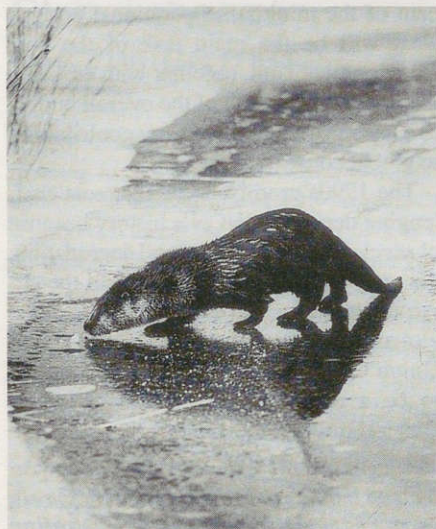
At its latest annual meeting in the Netherlands (2-6 July 1990), the International Whaling Commission adopted a resolution calling for the IWC Scientific Committee to report to next year's meeting on the status of all small cetacean stocks currently subject to directed and incidental takes.

Up to now the IWC has declined to take any action to protect smaller whales, because some members believe it has no authority to do so. The lack of opposition to the resolution (20 votes for, none against, nine abstentions) may be a sign that the deadlock is at last beginning to break.

Proposals to lift the current moratorium on commercial whaling were all defeated: most members believed that the ban should remain in effect until a scientific basis for regulation of whaling has been developed. Some cited the World Conservation Strategy in support of this position.



Breaching killer whale (photo: WWF/Goebel).



European otter (photo: WWF/W. Lapinski).



A picture of patience: timber elephant at work (photo: WWF/Peter Jackson).

Conserving a patient species

The Asian elephant *Elephas maximus* is an unusual wild animal: after a few months of teaching, it behaves towards people with patience and understanding.

It is also in grave danger. The surviving wild population of 30-55,000 is less than a tenth of the total of African elephants. Habitat loss and pressures of human population are the major threats in the 13 Asian countries where the elephant is found. The loss of elephants can be particularly severe since they form the backbone to labour in the timber industry in several Asian countries. Without elephants, it might become more profitable to clear-fell forests, rather than manage them sustainably.

IUCN has now produced guidelines to reconcile the preservation of this species with human interests: *The Asian Elephant: an Action Plan for its Conservation*. "It will not be possible to save all of Asia's wild elephants," the Action Plan points out, "but losses can be kept to a minimum if economic development plans take into account the needs of elephants, and planning for elephant conservation takes into consideration the needs of local people."

Compiled by Charles Santiapillai and Peter Jackson of the IUCN/SSC Asian Elephant Specialist Group, the report urges that National Conservation Strategies include elephant conservation in countries where the species is found. It suggests establishing managed elephant ranges and protected areas, national and international corridors to facilitate elephant migration, steps to reduce conflicts with people, and guidelines on how to stop elephants from raiding crops.

In order to promote the implementation of the Action Plan, SSC has established the Asian Elephant Conservation Centre in Bangalore, India. This office will be working with Asian governments and NGOs to ensure that the conservation priorities are acted upon.

Otter action

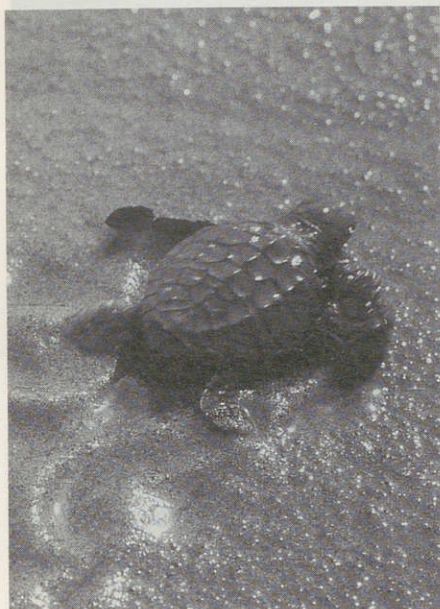
Otters are found in oceans, rivers, lakes and marshes, wherever there is clean, unpolluted water, undisturbed bankside cover and a good food supply. But eight of the 13 otter species are rated as "vulnerable" or "insufficiently known" in the IUCN Red List of Threatened Animals. "In fact, most of the otters are insufficiently known, and most are rapidly disappearing along with the clean wetlands they inhabit worldwide," says Pat Foster-Turley, who chairs the IUCN/SSC Otter Specialist Group.

A 124-page programme to save them has just appeared as *Otters: an Action Plan for*

their Conservation, with seven global recommendations from the specialist group. They range from a ban on PCBs and similar persistent environmental contaminants to public awareness campaigns.

"Otters are indicators of healthy aquatic environments in much of the world," writes Dr Foster-Turley in the introduction to the Action Plan. "As the world becomes increasingly congested with humans and waterways become polluted with their wastes, otters become increasingly scarce."

The Action Plan includes chapters on the biology of otters, threats, captive species, reintroductions and separate strategies for each region where otters are found.



Pacific ridley turtle hatchling (photo: WWF/J.P. Schulz).

Guyana: working with CITES

Guyana's Ministry of Agriculture, IUCN and the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are to work together in implementing recommendations in a management plan for caiman. The plan was drawn up by IUCN on behalf of CITES.

The Government now has an inventory of all skins in storage in the country and all have been tagged. The US Fish and Wildlife Service sent a consultant to Guyana who collaborated with consultants from the Government and Paraguay in carrying out this first recommendation of the management plan.

Steve Edwards, Coordinator of the IUCN Species Conservation Programme, went to Guyana at the end of the inventory for talks with Government officials about the recommendations for conservation and management of the reptiles.

The plan foresees creation of a formal unit within the Ministry to oversee the caiman population and further implementation of the tagging system initiated during the inventory. Field studies will continue to monitor the status of the spectacled and black caimans, the latter an endangered species, in Guyana. As part of the public awareness and education section, field workers will receive training in such skills as preparing skins for market.

The management plan, translated into Spanish, is being distributed widely as a model for other countries.

Working for turtles

Following the change of Government in Panama, the wildlife department, IN-RENARE, has requested temporary assistance in the implementation of a management plan for marine turtles on Isla Caña, which contains major egg-laying beaches.

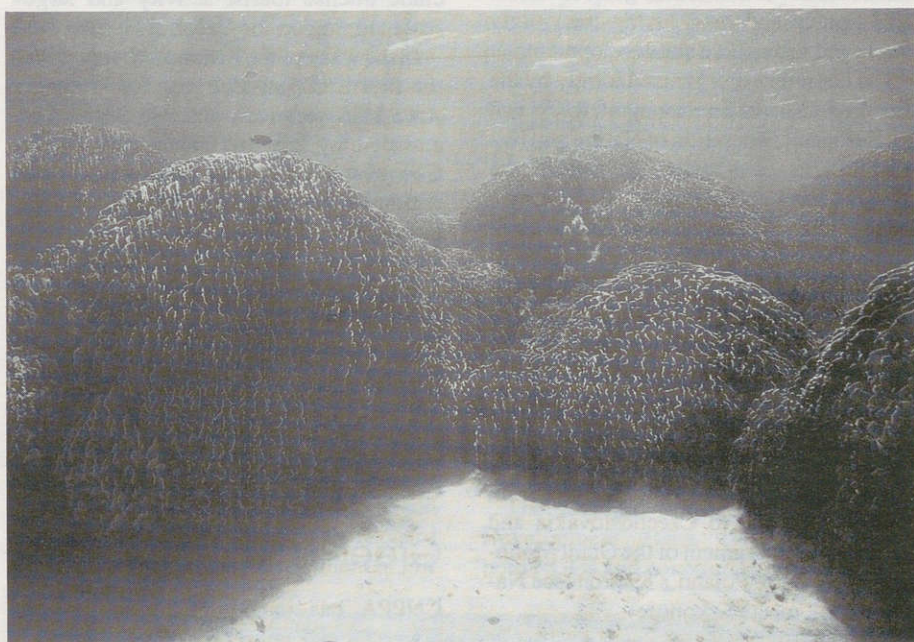
As a result of IUCN/SSC's network contacts, the Washington-based Centre for Marine Conservation (CMC) has provided a bridging grant for a volunteer who has already been working on Isla Caña for several months. The support will enable her to continue awareness activities with local inhabitants and carry out turtle tagging until the department can build up its own programme.

Tapir newsletter launched

The first issue of *Tapir Conservation*, a newsletter of the IUCN/SSC Tapir Specialist Group, appeared in September 1990. The newsletter is edited by Sharon Matola, who chairs the group.

Published with the support of Conservation International, the first issue includes several reports from the field, some on projects started only recently, and several proposals that need funding. It provides a list of current members of the group and a tapir bibliography.

"Tapirs are among the most primitive large mammals in the world, appearing approximately 50 million years ago," Ms Matola notes. "All four species live in tropical regions of the world that are coming under increasing threat of habitat destruction. This newsletter represents the first real effort of the Tapir Specialist Group to establish an effective international network of communication among its members."



Shiraho reef's blue corals may not stand a chance (photo: Lynn Funkhauser).

Shiraho appeal

After talking with villagers and carrying out an impact assessment of a proposal for an airport at Shiraho Reef, Ishigaki Island, Japan, IUCN has appealed to the Government to adopt a development programme to offer long-term economic stability for the island as well as protection for the largest stand of blue coral in the world.

The study was carried out with support by WWF-Japan and the Nature Conservation Society of Japan following a decision to move the airport four km north of the site originally proposed.

"The principal conclusion of our report is clear," said Steve Edwards, who coordinates the IUCN Species Conservation Programme. "If the airport is built at the proposed site, the reef will be destroyed. Further, as the healthiest reef in the region, its destruction will directly affect fisheries, tourism and the local inhabitants who depend on the reef for their livelihood. Indirectly, land changes will probably affect the water drainage and stability of the water-table on which the residents also depend."

The environmental recommendations form part of a package of economic and social proposals related to agriculture, fisheries, tourism, public works and policies to stop the 'brain drain' of skilled and educated young people from Ishigaki Island. The report also suggests that the Shiraho villagers themselves should prepare an integrated management plan for the reef, its watershed and other lands.

Commission on National Parks and Protected Areas (CNPPA)

Parks, people and pollution

IUCN's largest-ever conference in Central Europe took place at the Krkonose National Park in Czechoslovakia this summer (3-8 June). The gloomy surroundings bore witness to the vulnerability of natural ecosystems. Research scientists, managers and policy makers from 25 countries (mainly in Europe) who gathered to talk about protected areas affected by air pollution could see around them great stands of dead spruce and other dying trees, ugly hotels and insensitive ski developments.

The conference, organized jointly by the Czech Ministry of Environment, IUCN and the European Federation of Nature and National Parks, was called to review the current level of damage, to examine management techniques available to combat the effects, and to discuss management guidelines for such protected areas. The Czech Government gave the meeting highest priority – the Czech Environment Minister appeared and addressed participants even though it was election week.

The conference adopted draft guidelines on air pollution controls required to safeguard protected areas, with a resolution addressed jointly to Czechoslovakia and Poland on management of the Giant Mountain area (where Poland's Karkonosze National Park meets Krkonose).

Krkonose appeared on the IUCN list of Threatened Protected Areas in 1984. With Krkonose national park authorities and the



Participants in the Krkonose Conference discussing problems in the field (photo: Krkonose National Park Administration).

Czech Ministry of Environment, the conference drew up an action plan for the Giant Mountains, whose special problems include intense tourist activity and large-scale logging on the Czech side.

In the wake of the Krkonose Conference, the first European Seminar for Protected Area Managers took place in September, attended by key staff from agencies in Central and Eastern Europe as well as other regions. The seminar, held in the UK, France and Germany, was the latest occasion for pan-European cooperation among protected area managers following changes in the East. In a report, Hans Bibelriether of the co-sponsoring Nature Federation singled out the September seminar as an indication of the new opportunities for cooperation and reported a rapid expansion of Federation members in Central and Eastern Europe.

Green links

CNPPA has joined 23 European non-governmental conservation organizations in an initiative entitled "Ecological Bricks for Our Common House of Europe". The

project's main aim is to establish a series of protected areas along national borders from Finland south to Bulgaria.

Many border areas have acted as security buffer zones and have been relatively unaffected by development since the end of World War II. With the relaxation of restrictions in this zone, the development potential of these regions is being reassessed. Many have high value for nature conservation, so transfrontier parks offer an attractive green option.

The major launch of the project will take place in Prague, Czechoslovakia, on 19 October. The initiative follows recent articles in the June issue of *Natural History* magazine on "Parks across the Border", prepared by CNPPA and the World Conservation Monitoring Centre (WCMC).

The greening of Queensland

The new Department of Environment and Heritage in Queensland, Australia, has taken several major steps to strengthen the State's protected area system.

On 10 August, the Minister, Mr Pat Comben, and the Federal Minister for Environment, the Hon. Ros Kelly, issued a joint statement establishing a management authority for the Wet Tropics World Heritage Site in Queensland. Administrative arrangements for the 9000 sq km site will include a high level of inter-governmental liaison backed up by community and scientific committees. The Commonwealth made a special grant of A\$10 (US\$7.7) million for capital works.

On 5 September, the State Government passed a "Greening Queensland" budget that provides a 58% increase in funding over the previous year, A\$5.5 (US\$4.2) million for the World Heritage Site and A\$10 million for new park acquisition. The new department aims to double the size of Queensland's national park system over the next three years. □



Opening of the Krkonose Conference (left to right): Bedrich Moldan, Czech Minister of Environment; Jan Cerovsky, IUCN Regional Councillor; Harold K. Eidsvik, Chairman of CNPPA and Conference Steering Committee; Vaclav Cerny, Czechoslovak Conference Coordinator (photo: Krkonose National Park Administration).



Mekong workshop...

A workshop to initiate a regional research and survey project on wetlands in the Mekong Basin took place on 14-20 August at Pattaya, south-east of Bangkok.

IUCN provided technical advice on the project, and Wetlands Programme Coordinator Patrick Dugan led discussions in the workshop on 17 August, dealing with IUCN's work in the region and critical issues affecting wetland resources in the Basin. The workshop was organized by the Interim Committee for Coordination of Investigations of the Lower Mekong Basin, popularly known as the Mekong Committee. Its active members are Laos, Thailand and Vietnam.

The research and survey project will continue for the next two years. IUCN will continue to provide regular support.

...and mission

Graham Baines, a member of the Commission on Ecology, took part for IUCN on a Mekong Committee mission to Vietnam on 17-27 July.

The mission visited the Mekong Delta to develop a project proposal for forest development by the government in the north-west of the delta at Long Xuyeng quadrangle. The IUCN representative was specifically concerned with environmental issues.

"The outcome of particular interest to IUCN members is a proposal for rehabilitation of the *Melaleuca* forests of the delta," reports Wetlands Coordinator Patrick Dugan. "The trees were sprayed with defoliant and napalm during the Vietnam war, and the wetland ecosystems have been even further degraded by unsuccessful attempts at drainage and by agricultural activities."

The Mekong Secretariat work programme will complement IUCN's own planned work with national and provincial authorities to develop a community-based *Melaleuca* management project in the same region. The IUCN project was drawn up after a visit to Vietnam in April.

Hot news from the Gulf

A three-day workshop took place in mid-September to discuss coastal zone planning. Rodney Salm, IUCN consultant on coastal zone management in the Sultanate of Oman, and consultant James Dobbin were both on hand.

"I am happy to report that so far the Gulf crisis has had no effect on the day-to-day running of our project or on our field work," says Dr Salm. "On the other hand, we are facing an ominous development of another sort: unusually high sea temperatures, possibly as a result of long-term climate change, have caused extensive bleaching of corals all along the coast."

"We started monitoring this effect on an *ad hoc* basis, even though we are not equipped to do a thorough job. In the Straits of Hormuz, where water temperatures stayed around 34-35°C for more than a month, coral mortality has reached more than 50% and is still rising. However, in the Muscat area, where temperatures were even higher (39°C) but for just a short period, there has been only 2% mortality and the remaining corals seem to be recovering."

"Clearly this situation is very serious and deserves a lot more attention."

National Strategy for Fiji

In early August an IUCN team started work on a National Environment Strategy for Fiji.

Over the next two years, an eight-person multidisciplinary team, led by Dr Richard Watling, will assist the Government of Fiji

to draft this important policy document, and will initiate the all-important process of consultation among various resource sectors in Fiji. The project will also:

- prepare a State of the Environment Report for Fiji;
- identify and classify ecologically sensitive areas and assess environmental legislation needs to support their management;
- prepare a national environmental monitoring programme; and
- prepare a public awareness and information programme.

To assist IUCN on the project, two team positions have been filled by staff of Environmental Services Australia (ESA), based in Sydney. This conveniently-located company will also assist in project administration.

The project is funded by the Asian Development Bank and is due to be completed by September 1992.

Brundtland follow-up in Asia

Seven Asian countries - Indonesia, South Korea, Malaysia, Nepal, Pakistan, Philippines and Sri Lanka - have recently carried out detailed reviews of their government policies in the light of *Our Common Future*, the report produced by the World Commission on Environment and Development, chaired by the former Norwegian Prime Minister Gro Harlem Brundtland.

The reviews, managed by the Asian Development Bank (ADB), involved both NGOs and government agencies. ⇐



Vietnam's Agent Orange Museum in the Mekong Delta was once mangrove forest (photo: Elizabeth Kempf).

A review panel met in Jakarta in July, and a final meeting took place in Manila in August. Jeffrey McNeely, Chief Conservation Officer, attended for IUCN.

Several of the countries – Malaysia, Nepal, Pakistan and Sri Lanka – have either adopted national conservation strategies or are doing so, often with technical support from IUCN.

Dr Bindu Lohani, head of ADB's Environment Department, considered the reviews a useful exercise both for the countries and for the bank. "We will use the results of the meeting to help us define our own priorities for investment," he explained. "The governments are presenting their national studies at an October meeting of Ministers of the environment in Bangkok."



Belize roadworks assessed

Stann Creek Valley road links Belmopan, the capital of Belize, with the south of the country. It serves the country's major citrus-producing estates and its two processing plants.

The tarmac road is narrow and in poor repair, and a project has been proposed to upgrade and resurface 24 km of it at a cost of £6 million, provided through the Overseas Development Administration (ODA) of the UK Government.

In early September, Jeffrey Sayer of IUCN's Tropical Forest Conservation Programme made a preliminary assessment of the environmental impacts of the project, at the request of ODA.

Helping Central America

IUCN has signed an agreement to provide technical support to the Central American Commission for Environment and Development (CCAD), set up when Central America's five State Presidents approved a regional Convention on Environment and Development in December 1989. A programme of support with US\$3.4 million



An environmental impact assessment will help determine the fate of the unfinished tourist complex at Lake Atitlán, Guatemala (photo: IUCN/Mette Junkov).

Which way for Atitlán?

Lake Atitlán National Park in Guatemala consists of a clear blue lake surrounded by volcanoes up to 3,550 m high. Part of an important watershed which supplies water for more than 120,000 people, the lake itself is becoming eutrophic from an oversupply of nutrients.

Its dramatic geological structure and its high ecological diversity has made Atitlán a popular tourist attraction, further increasing the environmental pressure on the Park. The lake was once surrounded by lush vegetation which has largely been replaced by cornfields, gardens and coffee plantations. Today little natural forest and only small numbers of wildlife remain.

A half-finished luxury tourist complex on private land within the Park has been awaiting completion for 15 years. Plans are also under way to construct a marina, a heliport, and an airstrip.

Answering a request from CONAMA, Guatemala's national environment commission, IUCN consultant Mette Junkov has carried out a preliminary Environmental Impact Assessment (EIA) on the project.

has been prepared and is being negotiated with prospective donors.

The CCAD, whose Secretariat will be based in Guatemala City, will have ten technical commissions, six of which will be funded through the new pact.

Caribbean holds first regional meeting

IUCN's Caribbean members held their first regional meeting in St Lucia on 29 August, using the occasion of the Annual General Meeting of the Caribbean Conservation Association.

The session was chaired by Regional Councillor Yves Renard and attended by Mark Halle, Director of the Field Operations Division. Major topics were the IUCN General Assembly, the 1992 World Congress on National Parks and Protected Areas, the draft World Conservation Strategy for the 1990s and the role of IUCN in

the Caribbean. A similar regional meeting of South American members took place for the first time last April in Ecuador.

IUCN and CATIE sign new accord

IUCN and the Centre for Training and Research in Tropical Agriculture (CATIE), based in Costa Rica, signed an agreement on 16 August to develop a strategy for cooperation.

The pact was signed by Director General Martin Holdgate for IUCN and by CATIE's Director General Dr Rodrigo Tarté Ponce.

"We have had a cooperative programme for several years," explains Mark Halle. "The new agreement means we shall be working much more closely in the field and putting together a programme for which both organizations can try to raise funds."



Rehabilitating the Danube Delta

An IUCN international mission to the Danube Delta has delivered an *aide memoire* to the Romanian Government with five preliminary suggestions for priority action to conserve the Delta, and has offered assistance from the Union and its partners in implementing the measures.

"The Delta is a wetland ecosystem unique in Europe, and, as we saw, it is still in a relatively sound ecological state," said Liz Hopkins who led the eight-member mission on behalf IUCN's East European Programme. "It supports a wide variety of species, many seriously threatened in the rest of Europe. However, as the excellent data provided by our Romanian colleagues showed and as we were also able to observe, the system has suffered a reduction in its natural productivity and diversity. The causes include canal, dyke and polder construction; damaging human activity such as intensive agriculture; and, upstream, pollution and degradation of the floodplains."

The team, including representatives of the International Council for Bird Preservation, Unesco, the Netherlands Foundation for International Nature Protection, the WWF-Auen Institute, the Delft Hydro-

logical Institute and the IUCN Wetlands Programme, received a guided scientific tour by boat. They explored parts of all three arms of the river and the reed beds, lakes, canals and polders lying between them; parts of the Black Sea coast and areas to the south of the southern arm. The mission ranged more widely than any previous scientific expedition to the Delta. Nearly 20 Romanian scientists, including the State Environment Secretary, joined them for at least part of the time.

"Our Romanian colleagues made available to us data which they had collected for many years under difficult conditions, and they made sure we met many people concerned with the delta, including those who are worried about the implications of the recent declaration of the area as a Biosphere Reserve, such as hydrological engineers who had been responsible for dyke and canal construction, and the mayor and councillors of a small village," reports Ms Hopkins. "We suggested that in restoring the Delta to its natural condition, the skills and knowledge of everyone should be used, even of those who up to now have had little experience of working according to conservation principles."

"In all, the Romanians taught us a lot. We have returned to our organizations to draw up a detailed technical report and project proposals that echo and amplify the priorities that the Romanians themselves identified. We are sure that the mission will help speed Romania's integration into Europe-wide environmental activities, especially since IUCN views work in the Delta as a first step in a strategy for ecosystem conservation and restoration along the whole course of the Danube River."

For more on the Union's East European Programme, see the special report beginning on page 27.

Applying conservation biology

What can biodiversity contribute to sustainable development? What is the role of conservation biology? What are the priorities for research?

A group of international experts met to consider questions such as these on 10-14 September in the World Heritage Site of Røros, Norway. The International Conference on Conservation of Genetic Resources for Sustainable Development was hosted by the Norwegian Institute for Nature Research (NINA).

In her opening address, Norway's Environment Minister Kristin Hille Valla stated: "In addition to our responsibility for preserving biological diversity in our own country, we and the other industrialized countries have a special responsibility for repairing and preventing further environmental destruction in the developing countries."

Vernon Heywood and Jeffrey McNeely of IUCN were among the speakers from 10 countries. Others included Dan Janzen, Michael Soulé, Stig Blixt, Anil Agarwal and Arne Naess. The conference approved a detailed set of recommendations directed to policy makers, researchers, managers and administrators. Copies are being sent to all IUCN members by NINA. Additional copies are available from the Biodiversity Strategy Programme at the IUCN Secretariat in Gland.

Plant list revised

Experts from countries signatory to the Berne Convention gathered to revise the list of strictly protected plant species given in Appendix I of the Convention. The workshop was held at Cambridge (UK) on 26-28 September, under the auspices of the Council of Europe. It was chaired by Professor Vernon Heywood, Chief Scientist, Plant Conservation, of IUCN.

"It has long been felt that the list was no longer representative of the current conservation status of the floras concerned," explained Prof. Heywood. "Moreover, many new species have been described since the Appendix was first compiled and numerous changes made in taxonomic status. A number of Red Books have also been published for plant species of the member countries."

The report of the workshop has been submitted to the Standing Committee of the Berne Convention.



Romanian environmentalists have taken the first steps towards conservation and restoration of Danube River ecosystems (photo: IUCN/Liz Hopkins).

Caring for wetlands

Patrick Dugan and two members of IUCN's Wetlands Advisory Committee, Ted Hollis and Ed Maltby, together with collaborators Enoch Dribidu of Uganda and Salihi Iliasu from Nigeria, took part in a workshop on freshwater issues to draw up recommendations for *Caring for the World* (the World Conservation Strategy for the 1990s).

The workshop, bringing together some 15 specialists, took place at Linköping in Sweden on 30 August - 2 September.

As a result of the discussions, the Strategy draft now urges strongly that in managing water, the whole system should be taken into account. Water users should not be concerned solely with what they can take out of the river network. They should also consider the multiple benefits that come from maintaining the water that is in the natural river system and using it to drive the natural productivity of aquatic ecosystems, both inland and on the coast.

Hislaire heads Niger office

Niger now has a full-time IUCN office with the arrival of Peter Hislaire from the Sahel Programme to become national representative in Niamey from the end of September. An agreement on setting up the office was signed with the Niger Government in August. IUCN has another national office in Mali and an office in Burkina Faso currently carrying out programme activities.

Sahel Programme Coordinators Per Rydén and Jip Ketel also visited Niamey in September for a meeting of Sahel Programme staff. "We took a considerable step towards country programming, that is, developing the Sahel Programme and activities much more at the country level," reports Per Rydén. "The programming process will be based on a thorough analysis of the natural resource management problems facing the country, its policy towards these problems, the general political environment, what others are already doing, and our own policy. Activities to be pursued by IUCN should then be tailor-made to this analysis."

Meeting participants included, among others, IUCN regional representative Gérard Sournia, Mali representative Lorian Dembele, Walia project director Adama Daou, Monique Trudel (formerly of Walia) in her new role as regional environmental communications adviser, and Chrystel Ferret, who is responsible for the school's environmental awareness project in Niger, known as *Alam* (the camel).



A workshop on programming has cleared the way for expanding IUCN activities in Uganda: pelicans and cormorants in Queen Elizabeth National Park calmly await the results (photo: WWF/Mark Halle).

Programming in Uganda

A pioneering programme workshop for Uganda was held on 20-21 September. IUCN's Regional Office for East Africa organized it, together with Ugandan partners including national authorities and the University of Makerere. IUCN's Patrick Dugan and Paul Driver took part.

The meeting was arranged to assess priority conservation needs in Uganda and ways in which IUCN can be of particular help. It also took the first steps in preparing a long-term programme for expanding the Union's work with Uganda.

"This is the first time in my recollection that a regional office has insisted that programme staff from Gland come and sit around the table with regional office staff and partners to look at priorities and how IUCN can best address their needs," said Dr Dugan, who Coordinates the Union's Wetlands Programme. "I think it is an initiative to be applauded."

Training to conserve biodiversity

IUCN recently collaborated with the city and Botanic Garden of Cordoba, Spain, in a training programme for over 30 graduate students and professionals involved in protected area management throughout Spain. The course, entitled "Biodiversity - A World Strategy for its Conservation and Development" - took place on 17-23 September. Classroom sessions were held at the botanic garden. Field work took students to the Sierra Nevada, where a seminar was held on the problems of reconciling tourist development in the Sierra with its status as a "nature park" and Unesco Biosphere Reserve.

Esteban Hernández Bermejo, director of the botanic garden and convenor of the course, says: "Education is one of our

major missions. In addition to the training course, we have five permanent seconded staff from the Ministry of Education who help us with our education programme. Over 22,000 primary and secondary students visited our garden last year. By giving emphasis to endemic species, economic plants and traditional agricultural systems, we are providing our community with a focus for conserving our local biodiversity."

IUCN, a patron of the training course together with the Botanic Gardens Conservation Secretariat and the local government of Cordoba, provided two lecturers: Vernon Heywood and Jeffrey McNeely. "The exchange of views with interested professionals helps the IUCN Secretariat keep its feet on the ground, and gives us an opportunity to share our experience with people who are on the front lines of conservation," remarks McNeely.

Closer links with ENDA

ENDA, an African environmental NGO based in Dakar, Senegal, signed an agreement with IUCN in August to work together in training and information. ENDA - Environnement/Développement Afrique - has already carried out a number of projects with the Sahel Programme.

Mauritania cooperates with IUCN

Mauritania has concluded a cooperation agreement with IUCN. Signed in Nouakchott on 12 August by the Mauritanian Minister of Planning and IUCN's Director of Field Operations, Mark Halle, the accord provides for cooperation in establishing a National Conservation Strategy, technical support and training, and help in coordinating activities as well as offering IUCN and its representatives the equivalent of diplomatic status. □

Sustainable use of wildlife:

*Banking on our natural capital***Wildlife as "natural capital"**

Early human societies hunted and gathered wildlife as the basis of their existence. Even today, wild species contribute in a vast diversity of ways to human welfare. We are part of the biosphere, and wild nature cycles the essential elements on which we depend, provides pasturage and pharmaceuticals, banks the genetic material on which our crop-breeders draw, and yields wood, fibre and food in many forms.

Human over-exploitation has undoubtedly impoverished nature. Mammoths, mastodons, moas and Megatheria are all believed to have been hastened to extinction by hunters. Fur seals and the great whales were brought near to the same fate by more modern and mechanized exploitation. Today we are anxious for the future of elephants, rhinos, turtles and parrots, all the targets of hunters who have more concern for profit than for the survival of their quarries.

Contemporary exploitation of wildlife is especially devastating when economic forces cross social frontiers.

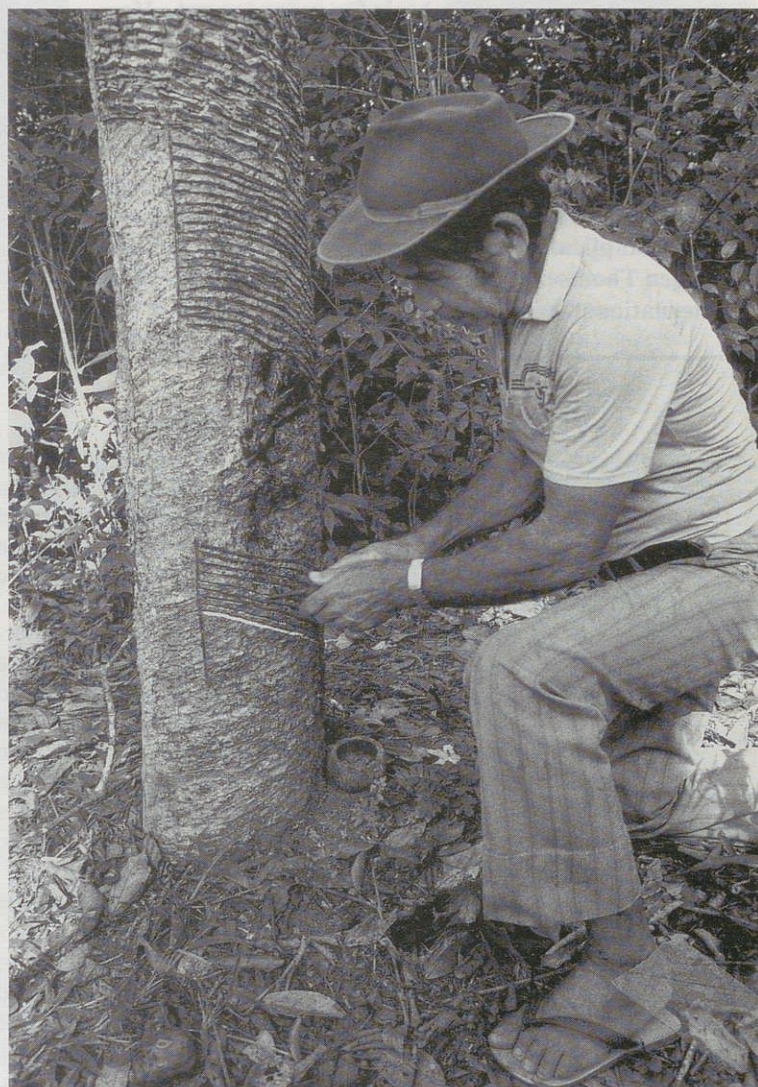
In many developing countries, wild animal species remain an important protein source, and their survival is not threatened by traditional methods of cropping (though they may well be endangered by habitat destruction). Many indigenous peoples had, and retain, cultural traditions that protect species from over-exploitation. But when economic demands for exotic products in the developed world greatly raise prices for wild species or products, pressures on poorer nations to respond to those demands become intense. Any notion of sustainable cropping can go out of the window.

The World Conservation Strategy, endorsed by all members of IUCN, emphasised ten years ago that it is legitimate to take a crop from wild species, provided that this does not endanger the survival of those species or their component populations or cause the disruption of the ecosystems to which they belong. The IUCN General Assembly in 1990 will review the principles that should govern the sustainable use of wildlife, including the need for capture methods to be as humane as practicable.

But while general principles are fine and necessary, how should we – how can we – regulate the use of wild species, and particularly animals, in practice?

This special section of the *Bulletin* looks at some of the issues we need to explore, beginning with economics. History teaches that where property rights have been established over wildlife in ancient royal hunting preserves, through game protection laws, or through establishing areas of wildlife habitat as national parks and reserves, there is more hope of effective controls and of the survival of species. Where the exploitation of a species has been licensed to single operators, taking quotas set on a basis of sound science – as with the former taking of males in polygamous species of seals – sustainability is possible. Wild lands set aside with their native species for sport and recreation have indeed become an economic asset in many countries, generating millions of dollars in revenue each year from tourists.

But reassuring examples remain rare, and are far over-balanced by demonstrations of mis-use and waste. The value of wildlife as "natural capital" is not taken into account in



Their campaigns to prevent rainforest destruction have made Brazilian rubber tappers the modern symbols of sustainable use of wild resources.

Photo: WWF/Mark Edwards

many national and local land-use planning decisions. Local people often do not benefit from revenues based on wildlife – which accrue to central Government departments rather than to the communities whose cooperation is essential if wildlife is to be sustained. There are still gaps in the scientific knowledge that must be filled if we are to manage wild species effectively.

Above all, we need to demonstrate that in many circumstances wild species have greater "value" than the things we might substitute for them. Their controlled use, on sound scientific and economic principles, should be seen as an important element in national and local land-use strategies.

That is the end towards which this *Bulletin* section seeks to lead.

*– Martin W. Holdgate
Director General, IUCN*

I. Issues

Can putting a price tag on wildlife help protect it? If so, how do we arrive at this value?

Even when we have determined a value, we need scientific knowledge as a basis for management. How do we get this?

Finally, we need to control trade flows so that conservation is not undermined. How?

In the following articles, Jeffrey McNeely takes us through the latest efforts of economists to evaluate wild species in market terms; Amie Bräutigam demonstrates how complicated wildlife management can be; and Jorgen Thomsen and Richard Luxmoore describe how international trade is monitored.

What value for wildlife?

Arguments for conservation should not be based simply upon economic considerations. Leaving aside the scientific and ethical reasons, simplistic attempts to put a price tag on nature are hampered by the reality that market values can change suddenly and unexpectedly.

Since the economic value of conserving biological resources can, however, be considerable, conservation can be regarded as a form of economic development; and indeed many development agencies are now considering major investments in conservation. Since biological resources have values, investments in conservation need to be judged in economic terms which consider both market and non-market values. This requires us to develop reliable and credible means of measuring the economic benefits of conservation.

Three main approaches have been used for determining the value of biological resources:

- assessing the value of nature's products – such as firewood, fodder, and game meat – that are consumed directly, without passing through a market ("consumptive use value");
- assessing the value of products which are commercially harvested, such as game meat sold in a market, timber, fish, ivory, and medicinal plants ("productive use value");
- and assessing indirect values of ecosystem functions, such as watershed protection, photosynthesis, regulation of climate, and production of soil ("non-consumptive use value"), along with the intangible values of keeping options open for the future and simply knowing that certain species exist ("option value" and "existence value", respectively).

Consumptive Use Value

Consumptive use values seldom appear in national income accounts but they can be substantial. A study of four indigenous Amazonian Indian groups found that the percentage of tree species used varied from 48.6 to 78.7 (not including wood collected for firewood or animal food). It indicates that the rainforests of Amazonia contain an exceptionally large number of species that are useful to local people. In Nepal, Tanzania and Malawi, firewood and dung are used to provide over 90% of the total primary energy needs and exceed 80% in many other countries.



How much is it worth? Boys carrying game meat from Kanyurira communal lands, Zimbabwe.

Photo: WWF/Aileen Ionescu-Somers

In Africa, harvested species make a considerable contribution to human welfare as food for rural people, and especially to the poorest villagers living in the most remote areas. In Botswana, over 50 species of wild animals provide protein, exceeding 90 kg per person per annum in some areas (some 40% of their meat diet); over 3 million kg of meat is obtained yearly from springhare alone. In Ghana, about 75% of the population depends largely on traditional sources of protein supply, mainly wildlife, including fish, insects and snails.

In terms of economic development, perhaps the most important point of consumptive use is that some rural communities closest to the forests or other natural areas can prosper through the sustainable harvesting of wild species, and almost all rural communities can gain at least some development benefit through proper management of biological resources which are consumed directly. Relatively small investments aimed at ensuring that such management systems continue to prosper can help avoid the much larger investments which are often required when biological resources have been so severely degraded that expensive environmental rehabilitation projects are required.

Productive Use Value

Productive use of such biological resources as fuelwood, timber, fish, animal skins, musk, ivory, medicinal plants, honey, beeswax, fibres, gums, resins, rattans, construction materials, ornamentals, animals harvested for game meat, fodder, mushrooms, fruits, dyes, and so forth can have a major impact on national economies. Wild biological resources also contribute to the production of domesticated resources in several ways:

- wild genetic resources are used to improve established domesticates (a contribution valued in the billions of dollars per year);
- wild species – especially of plants – serve as sources of new domesticates (in the country of origin);

- rangeland and wild forage species contribute to livestock production;
- wild pollinators are essential to many crops; and
- wild enemies of pests help control their depredations on crops.

Robert and Christine Prescott-Allen, in a ground-breaking study, concluded that 4.5% of gross domestic product (GDP) in North America is attributable to wild species. The combined contribution to GDP of wild harvested resources averaged some US\$87 billion per year over the period 1976 to 1980.

The percentage contribution of wild species and ecosystems to the economies of developing countries is usually far greater than it is for industrialized countries like Canada and the USA, especially if consumptive use value is included.

Indirect values of biological resources

Indirect values, which deal primarily with the functions of ecosystems ("environmental services"), do not normally appear in national accounting systems but they may far outweigh direct values when they are computed. Direct values often derive from indirect values, because harvested species of plants and animals are supported by the goods and services provided by their environments. In Sabah, for example, recent studies suggest that high densities of wild birds in commercial *Albizia* plantations limit the abundance of caterpillars that would otherwise defoliate the trees; the birds require natural forest for nesting. As another example, the US National Marine Fisheries Service estimates that the destruction of US coastal estuaries between 1954 and 1978 cost the nation over US\$200 million annually in revenues lost from commercial and sport fisheries.

Regulating the harvest

Problems with pearl mussels

In the late 19th and early 20th centuries, the freshwater bivalves of the family Unionidae, commonly referred to as naiads, were heavily harvested in North America for pearls and for manufacture into pearl buttons. Since the 1940s, a small number of these species have been virtually the sole source of the shell beads made by Japanese technicians for implanting into pearl oysters (*Pinctada spp.*) as the nuclei around which cultured pearls grow.

The cultured pearl industry is worth billions of dollars worldwide. It extends from Japan to Australia, taking in numerous countries in between. It offers considerable opportunity for economic development. As an example, cultured black pearls have been French Polynesia's leading export commodity since 1983. According to the Tahitian Ministère de la Mer, roughly 500 kg of cultured black pearls were exported in 1988, with an estimated value of US\$23 million. Japan alone declared export values for cultured pearls in 1987 totalling US\$378 million.

Research carried out under the auspices of the IUCN/SSC Trade Specialist Group suggests that the volume of commercial exploitation may now be threatening freshwater pearl mussels in the United States. Preliminary results of a review of trade data by the US Fish and Wildlife Service suggest that exports of raw mussel shell from the United States have averaged a minimum of 5,000 to 6,000 tonnes per year since 1985. This was a dramatic increase over export levels from

The first step and after

Whatever method is used, economic valuation is only a fundamental first step. It informs planners, resource managers and local people about how important biological diversity may be to national development objectives, demonstrates how important an area is for the biological resources it contains, reveals common interests in conservation among various sectors, and facilitates comparison of costs and benefits of different development proposals.

The second step is to determine how these species and areas can be conserved. It is here that economic incentives and disincentives can play their important role in ensuring that the benefits suggested above are in fact delivered to the community, and that the community in turn is enabled to protect the resources upon which its continued prosperity depends.

— Jeffrey A. McNeely



Jeffrey A. McNeely is IUCN's Chief Conservation Officer.



There is an easier way: the tradition of diving for natural pearls has given way to the culturing of pearl oysters and mussels.

Photo: WWF/Alain Compost

the late 1960s, when overharvesting forced a drop in exports to as low as 600 tonnes in 1971.

Of the 297 Unionid taxa native to North America, 13 are believed to be extinct, 35 are listed as endangered, and a further 55 are or have been candidates for listing under the Endangered Species Act. These 90 – or 103 – species must be considered an absolute minimum list of threatened naiad species.

For many species, changes in hydrology and water quality due to impoundments and channelization, siltation, and pollution, have been the major factors threatening their survival. Loss of fish hosts necessary for reproduction has been a



Amie Bräutigam is Deputy Chairman of the IUCN/SSC Trade Specialist Group.

problem. Acid rain and the introduced zebra clam are additional potential threats. The level of exploitation for the cultured pearl industry is now adding a further pressure on the species.

Although export documents might suggest that the naiad harvest is limited to only a few, generally common, species, the nature of the harvest virtually ensures that threatened or protected species are taken incidentally wherever their ranges overlap with commercial harvesting. Murky water and non-selective gear are mainly responsible for this incidental take, which not only threatens the survival of a number of

threatened species but also involves a substantial volume of specimens of no commercial value. Steve Ahlstedt of the Tennessee Valley Authority, one of the world's experts on these animals, believes that as many as 15 tonnes of mussels may be harvested to yield one tonne of commercial export value.

The incidental take of threatened or protected species in the commercial harvest is obviously cause for concern. The

sheer volume of the harvest, particularly in light of Ahlstedt's assertion and the past history of over-exploitation of these complex and environmentally-sensitive animals, also raises questions about the sustainability of the harvest.

Malacologists and fisheries biologists most familiar with these species seem to agree that naiad populations are being over-harvested, but this consensus has yet to be translated into effective management at the state or federal level, due to lack of financial and staff resources for research necessary for assessing sustainable levels of harvest and for implementation and enforcement of management regimes and harvest restrictions.

To guarantee that the naiad supply continues as a viable long-term resource for the expanding cultured pearl industry, research and population monitoring programmes must be implemented immediately. Harvest and trade controls must be tied to a broad assessment of the status of the principally traded species and take into consideration the biological and ecological requirements that will affect populations' long-term viability. Additional research and investment into culturing the mussels themselves for use in the cultured pearl industry may also be necessary. If the industry is to remain sustainable, it must make this investment now.

— Amie Bräutigam

Monitoring trade in the world's wildlife:

From orchids to elephants

Modern-day wildlife utilization is often dominated by illegal harvests. In most cases, international trade in wildlife products with high commercial values is controlled by a relatively few individuals who remain insulated from the enforcement of legal controls in the source country.



For example, the bulk of the trade in elephant ivory is believed to have been controlled by only two individuals. In 1989, prior to the imposition of the ban on imports of ivory in most industrialized countries, 60,000 kg were exported with an estimated value of US\$8,640,000. It is estimated that over 1,000,000 crocodilian skins are traded each year and half are obtained illegally. In India, over 40,000,000 frogs were harvested each year to serve the frog-legs market in Europe, prior to the imposition of an export ban in 1987. And, in Tanzania several million songbirds are exported annually with a net return of only US\$20,000 to the country.

What is evident from the information we have is the need to enhance our ability to monitor international trade patterns in species products and to identify illegal, over-exploitive harvests. Governments need to be informed of illegal trafficking. Consumer prices must be communicated to exporting governments.

Conservationists, therefore, increasingly require accurate information on trade in wildlife and wildlife products. Two organizations are working hard to provide these data: TRAFFIC and WTMU.

Songbirds for sale: a bird market in Peru.

Photo: WWF/Hartmut Jungius

TRAFFIC

The TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce) Network was first established in 1976 as a specialist group of the IUCN Species Survival Commission. Its purpose was to monitor the growing economic use of wildlife, primarily through international trade, that was known to be threatening many species.

The establishment of the network, initially as a single office based in the UK, virtually coincided with the entry into force of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). Since that time, it has expanded into a global network consisting of nine offices covering Asia (Japan), Europe (Belgium, France, Germany, Italy and the Netherlands), Oceania (Australia), South America (Uruguay) and the United States. Two additional offices are to open in the near future: TRAFFIC East Africa and TRAFFIC Southeast Asia.

The TRAFFIC network extends beyond its regional offices to include contacts in Customs, wildlife law enforcement, and other government agencies worldwide, wildlife dealers and industry representatives, and IUCN/SSC Specialist Groups.

TRAFFIC International, based at Cambridge (UK), coordinates the network's activities in conjunction with WWF and IUCN. In addition, TRAFFIC has long enjoyed a special relationship with the CITES Secretariat, providing expertise on trade levels and trends and illegal transactions.

Wildlife Trade Monitoring Unit (WTMU)

The Wildlife Trade Monitoring Unit is part of the World Conservation Monitoring Centre (WCMC)* in Cambridge, specializing in the collection and analysis of data on trade in wildlife.

Until 1981, TRAFFIC International served as the central repository for trade data. In 1981, WTMU took over this role, and has since accumulated the world's largest database on wildlife utilization. Other units at WCMC hold data on the status and distribution of plant and animal species and on the world's protected areas and threatened habitats, and so the integration of these services at the Centre makes it possible to assess the full impact of trade.

The core of the database is held on behalf of CITES, and contains all records of trade in species covered by the Convention which are submitted in the annual reports of the Parties. This stretches back to 1975, and today contains more than 1.25 million records of trade in species from orchids to elephants.

Although careful analysis of these data does reveal instances of illegal trade, they principally relate to trade carried on legitimately under CITES rules. This makes it necessary to supplement the data from other sources. WCMC therefore maintains a database on trade in wildlife products reported in national foreign trade (Customs) statistics, and an extensive library of published and unpublished reports.

* WCMC, while operating as an independent charity in the UK, is jointly funded by IUCN, WWF—World Wide Fund for Nature and the United Nations Environment Programme (UNEP) for the purpose of maintaining data on various conservation issues, including the status of selected species, protected areas, habitats and trade in wildlife and wildlife products.



Spectacled caiman skins in Bogota, Colombia.

Photo: WWF/D. Golobitsh

Since its inception, TRAFFIC has monitored levels of trade in wild plant and animal species on the basis of CITES annual report statistics, Customs, and other national and international statistics. It has drawn the attention of the general public, non-governmental organizations and government agencies to trade problems; tracked illegal trade; and advised on appropriate legal and regulatory measures to control wildlife trade.

— Jorgen Thomsen, Director,
TRAFFIC International



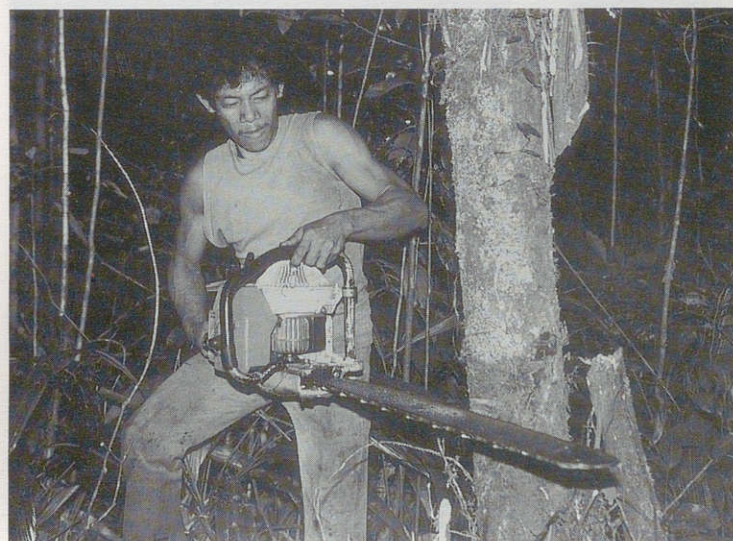
Recently, WTMU began a major initiative on behalf of the International Tropical Timber Organization to assess the status of threatened timber species and to investigate ways of monitoring international trade in them.

WCMC also benefits from the recent re-establishment of TRAFFIC International, which shares office accommodation and provides input from the extensive network of TRAFFIC offices. They, in turn, draw on WCMC's database for the analysis of global trade patterns.

— Richard Luxmoore
Acting Head of WTMU

WTMU is investigating threatened timber species and ways to monitor their trade. Pictured: illegal logging in southern Kalimantan, Indonesia, June 1990.

Photo: WWF/Rob Webster



II. Case studies

The best way of ensuring that wildlife is conserved for planned, sustainable use is to demonstrate that it can be done – and bring economic benefits to those who participate. Success also requires population monitoring and harvest controls that prevent over-exploitation, and a capacity to control demands for the product.

Few projects have applied these principles in practice. Christine Prescott-Allen describes four cases where both the local population and the natural environment have benefited from carefully-managed exploitation of wild species.

In the first study, we see that when a wildlife industry is shut down because of over-exploitation, rural people can lose their only source of income. Snake venom collection in India has enabled a people who lost their livelihood to develop a replacement source of earnings.

Snake in the grasp

The Irulas have traditionally shown remarkable skills in snake catching. These tribal people living mainly in Andhra Pradesh, Karnataka and Tamil Nadu were the main suppliers to the southern Indian snakeskin industry for at least three generations.

However, the snakeskin trade – nationally accounting for more than six million snakes a year – was not sustainable. In 1972 the central and state governments banned both the export and domestic trade. The shutdown deprived the Irulas of virtually their only source of income. An experimental snake venom collection project, first discussed in 1975, was devised to provide them with a substitute income while preserving and using their hunting skills.



Venom extraction from an Asian cobra.

Photo: WWF/Romulus Whitacker

Venom in demand

Every year more than 10,000 people in India die of snake bites. Reasonably priced, high quality venom from four species (Indian krait, Asian cobra, saw-scaled viper and Russell's viper) is needed for Indian laboratories that produce antivenin serum. Antivenin serum is the only cure for snakebite from these species.

The international demand for venom is also high, but not just for antivenin serums. It is used in drugs to control haemophilia, to break open blood clots during dental surgery, to combat hypertension and to ease pain caused by arthritis and spinal tuberculosis, as well as in neurological and other medical research.

The Irula Snake Catchers Industrial Cooperative Society was registered in 1978 with a membership of 26 snake catchers. Venom production did not begin until 1982 because the Wildlife Protection Act limited the capture of snakes and the Irulas needed government permission to begin collecting snakes and extracting venom.

Non-destructive methods

At the cooperative, captured snakes are weighed, measured, sexed and, except for the saw-scaled vipers (which are too small) marked with a clip-code for identification. Apart from providing biological data, this prevents premature recapture. The snakes are kept in mud pots, which allow quick and easy handling and keep them cool. They are held in captivity for only three weeks, with one venom extraction per week (the standard extraction technique is easily learned and the equipment relatively simple and inexpensive). The snakes are then returned to the wild. Mortality is no more than one in 100 of total captures. Snakes are caught throughout the district, to avoid pressure on a few populations.

The cooperative is the only venom production unit in India where snakes are obtained locally and not killed. Other institutions produce venom by extracting it repeatedly from each snake until the animal dies.

For the Irulas, snake catching is a family affair.

Photo: Animals Animals/Earth Scenes/Christine Prescott-Allen

Multiple benefits

Each snake catcher is paid according to the number of snakes brought to the cooperative. All co-op members receive medical and educational benefits. They can also obtain grants or loans for improved housing.

The co-op trains young Irula men in venom extraction and laboratory techniques and offers them work at the co-op on rotation. Some of the trained extractors are now working for the State Government's venom production unit, the King Institute in Madras, which started in 1989. The King Institute is also hiring Irulas as snake catchers.

Growing confidence

The project is a rare example of development assistance to tribal peoples that contributes to their economic self-reliance without attempting to change their way of life. The Irulas of Chingleput are proud of their heritage of snake-catching, which contributes to their sense of identity and self-worth as individuals and as a people.

The cooperative is now India's largest venom-producing unit; domestic sales in 1988-1989 totalled more than US\$15,000. The co-op has been financially self-sufficient

since 1984 and paid off its loans in 1986. Since 1987, it has been managed entirely by Irulas. Membership is now 150.

The project has enabled the Irulas to earn an income from live snakes that is several times greater per snake than their previous income from dead ones, and given them confidence that they can run their own affairs and operate successfully in a modern economy and society.

Financial support for the Irula cooperative came from the Indian Government's Department of Science and Technology, the Royal Norwegian Agency for Development Cooperation (NORAD), Oxfam (India) Trust and WWF-India. Madras Crocodile Bank provided technical support. Romulus Whitaker of the Crocodile Bank, as chief technical advisor, devised humane treatment policies for the co-op. Harry Andrews of the Crocodile Bank gave eight months of training in snake care, venom drying, snake release and data collection.

Development agencies often see handicraft production as a way of increasing rural incomes. They rarely consider whether the resources are used sustainably. But in Nepal a UNICEF-supported handicraft project is taking steps to ensure that it is sustainable.

Beyond paper profits

Handmade lokta paper, crafted in Nepal for at least 800 years from the fibrous inner bark of two wild *Daphne* species, has long been prized for its beauty, strength and durability.

When China closed the border with Tibet in 1959, the Nepalese handmade paper industry lost its main export market – Tibetan monasteries which used lokta paper for block-printing Buddhist scriptures. Undercut by cheaper machine-made paper from India, the domestic market also declined. The only domestic uses of handmade paper that remained were for documents that must last for many generations: judiciary, loan, deed and land registration papers. By 1980 the industry was on the verge of extinction. Hundreds of lokta harvesters, paper-makers and block-printers seemed likely to lose their livelihood.

UNICEF, the United Nations Children's Fund, came forward to help. It developed a project to revive lokta paper making and provide a guaranteed market for the finished product through its greeting card operation in Geneva, Switzerland.

The project began in three rural panchayats (Hatiya, Myagdi and Pang) and one urban centre (Bhaktapur). Hatiya had a tradition of lokta harvesting. Myagdi had a supply of lokta. Pang was recognized for its paper-making skills. Bhaktapur, noted for its tradition of woodblock printing, was the economically most depressed city in the Kathmandu Valley. All four places had a plentiful labour force.

Rapid expansion

The seasonal harvesting and paper-making operation now employs 884 families (up from 282 families in 1982); the printing unit – Bhaktapur Craft Printers (BCP) – has 100 people full time (up from 33 in 1982). Annual salaries to



For UNICEF the lokta project is unique for combining income-generation with the organization's fundamental goal of improving the living conditions of children in developing countries.

Photo: UNICEF

all part-time and full-time workers total approximately US\$327,000.

Profits go into community development and welfare funds. These have helped pay for drinking water supplies, sanitation, health and veterinary services, education, irrigation, flood and landslide control, construction materials for community halls and schools, and tree nurseries and plantations.

For the first two years, only greeting cards were produced, all bought by UNICEF. In 1984 it was decided to expand the product line and to include other foreign buyers and domestic consumers. BCP now also produces bookmarks, decorative wrapping paper, covered writing pads, storage envelopes, stationery and carrier bags. Foreign buyers include Body Shop, CARITAS, Cost Plus Inc., and Global Partners. UNICEF, however, still accounts for 71% of sales.

In theory, the project has been financially self-sufficient since 1985. However, it continues to be cushioned by UNICEF's purchasing power and ownership of BCP

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(UNICEF provides US\$30,000 a year of marketing assistance, and BCP pays no taxes.)

In 1989 UNICEF drew up papers to turn BCP into a private limited company to be owned by the participating communities (45%), BCP staff (5%) and the Agricultural Development Bank of Nepal (50%).

Finding a balance

Bhaktapur Craft Printers was given exclusive rights to lokta from the five major forests in the project area. Between 1981 and 1984, lack of a harvesting management programme significantly reduced the stands of lokta within reasonable distance of the participating panchayats.

A management programme introduced in 1985 assigned lokta stands to the panchayats and established a quota and harvest rotation within each block. In 1986, following a comprehensive inventory, harvest rotations were lengthened from four to six years. BCP's paper buying procedure was changed. It bought only the number of sheets that could be made from each paper-maker's allocation of lokta.



Field collecting at a butterfly farm in Papua New Guinea.

Photo: WWF/W. von Schmieder

The traditional Nepalese process of making lokta paper uses wood for fuel to cook the pulp, and ash – the ash-lye solution speeds bark degeneration during cooking. To lessen the impact on an already depleted fuelwood resource, UNICEF has promoted more efficient stoves and caustic soda (which reduces the amount of ash required). The use of caustic soda reduces fuelwood needs by 75%. Even with these improvements, 1kg of lokta requires about 4kg of fuelwood, so the project has also funded fuelwood plantations.

The lokta harvest, set at around 135 tonnes a year, now appears sustainable. But there is a shortage of direct information on harvest levels and on harvesting techniques. It is important not to destroy meristematic tissues of the stump so that coppicing can take place (lokta harvesters are taught to use this technique at an annual workshop, but there is no monitoring to ensure correct cutting).

And fuelwood harvests may not be sustainable. BCP and the Nepalese Government have funded a number of nurseries and plantations in the project area, but there is not yet sufficient information available to judge whether this is enough.

Butterfly rearing in Papua New Guinea is an attempt to increase local support for conservation of wildlife populations and habitats by increasing the economic benefit from wildlife.

Micro livestock, macro returns

The world market for tropical butterflies is worth tens of millions of dollars a year. It includes collectors such as museums and hobbyists, scientists engaged in research on systematics, ecology, ethology or evolution, and commercial enterprises like manufacturers of wall ornaments, inlaid trays, tabletops, coasters and placemats.

Some of the most sought after butterflies are native to Papua New Guinea, among them birdwings (*Ornithoptera* and *Troides*), jays (*Graphium*) and fluted swallowtails (*Papilio*).

To protect the species, the Fauna Protection Ordinance of 1966 banned collecting or trading seven of the rarest birdwings. But habitat loss from logging and large-scale forest removal for oil palm continued to threaten two of the country's birdwings – *Ornithoptera alexandrae* and *O. meridionalis* – and one of the fluted swallowtails, *Papilio moeneri*.

Conservation efforts, therefore, have focussed largely on using the butterfly trade to provide an economic incentive for rural people to protect their forest habitats.

IFTA launched

Butterfly "ranching", in which the offspring of wild insects are reared in captivity, began on a pilot scale in 1974. Three years later a feasibility study recommended a wider project, on the basis of which the Wildlife Division of the Department of Lands, Surveys and Environment established the Insect Farming and Trading Agency (IFTA) in 1978.

IFTA provides advice and equipment to butterfly ranchers and collectors. Ranchers can also obtain larval food plants from IFTA. As the sole exporter of insects from Papua New Guinea, the agency buys, markets and ships ranches and

wild-caught specimens, ensuring quality control and guaranteeing fair prices and prompt payment to its rural suppliers.

In the early years, wildlife extension officers visited villagers to explain and demonstrate procedures, including how to recognize a valuable species in each of its life stages, and how to prepare specimens for shipping to IFTA. Extension services have ceased due to lack of funds but IFTA occasionally brings in prospective farmers from new areas for a one-week course.

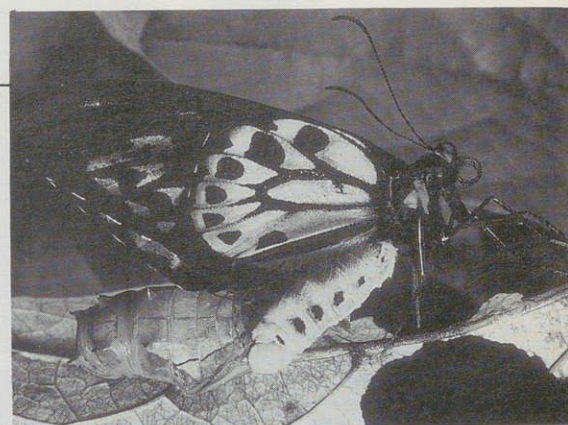
The agency also carries out research, including identification of new food plants that will enable the farming of more species, compilation of data to monitor conservation status of species, and investigation of management measures for protected butterfly species.

The Papua New Guinea Department of Environment and Conservation funded IFTA for the first five years. Since 1984 IFTA has paid for itself as a self-sustaining non-profit organization. As well as butterflies, it sells moths, beetles, stick and leaf insects and other species largely collected from the wild. The biggest export markets are in France, Germany, Japan and the USA.

Why it works

Butterfly rearing costs little, requiring no fencing, fertilizers, pesticides, veterinary services, artificial insemination or animal housing. And it is particularly suited to remote areas because the butterflies are a relatively high value product, light in weight and easy to ship by post at standard rates.

Butterfly ranching has several economic and conservation advantages over collecting. Ranching takes less time than collecting. Planting larval food plants and nectar rich flowers for the adults increases the number of butterflies in an area. The survival rate of wild butterflies is very low due to predators and diseases; ranchers can protect stock from both. Unlike butterflies raised in captivity, wild butterflies



Butterflies can be good business. Top left: specimens at market in Peru. Right: a major ranching species, *Ornithoptera priamus*.

Photos: (left) WWF/Fredy Mercay;
(right) WWF/Michael Terrettaz

are seldom in perfect condition. Although reared butterflies account for only 30% of IFTA's butterfly exports, they bring in 60% of the revenue because of their better quality.

Good business, good conservation

The project started with fewer than 30 villagers from two provinces. Today there are up to 500 participants from villages in 10 provinces. One hundred of the participants rear butterflies in captivity. In the first 10 years of operation, IFTA has paid well over US\$ 1 million to rural insect ranchers and collectors.

The project is clearly compatible with the conservation of a diversity of butterfly species and habitats. Insect rearing helps relieve pressure on wild populations and provides an economic incentive for conserving butterfly species and gene pools. The numbers of the two main ranching species, *Ornithoptera priamus* and *Troides oblongomaculatus* (both birdwings), are reported to have increased greatly because of enrichment planting of their larval foodplant. Insect rearing helps to protect habitat because it leaves the bulk of the land intact and it provides landowners with an income without requiring them to cut down forest for timber or cash crops.

Community forestry that neglects native tree species is likely to be community forestry in name only. This is because a variety of native species is usually required to supply the full range of benefits that rural people obtain from trees. The Nepal-Australia Forestry Project is a rare example of a forestry project that relies heavily on native species.

Seeing more than wood in trees

Forests are crucial to existence in the Sindhu Palchok and Kabhre Palanchok Districts of Himalayan Nepal. Trees and undergrowth provide much of the fodder and most of the bedding for livestock. The only fertilizer applied to cultivated land usually comes from the manure and composted bedding from villagers' tethered and stall-fed animals. Biomass is the major fuel, much of it obtained from the forest. Wood for construction and implements is a significant product.

The human population – 540,400 in 1981 – depends almost entirely on subsistence agriculture. But only 79,000 of the region's 388,580 ha can be cultivated. The elevation falls from over 7000m to 300m in only 100km.

Though the total area of farmland and forest has changed little during the 20th century (after 200 years of substantial deforestation), the woodland has severely deteriorated: a third of the 200,000 ha of forest area today is highly degraded shrubland and grassland almost devoid of trees. Much of the rest is remote from habitation.

As a result, pressure on the accessible forest is high, particularly for fodder and bedding. It has been estimated that 3.2 ha of accessible forest are needed to support each hectare of agricultural land.

In Sindhu Palchok there are 1.69 ha of such forest per agricultural hectare, and in Kabhre Palanchok the ratio is even worse: 0.52. Existing forests are inadequate to meet minimal subsistence needs. Nor do people have anything like enough wood for their fuel requirements.

Australia has been providing financial and technical aid to Nepal's forestry sector since 1966. In 1978 the Nepal-



Chir pines grow readily on degraded sites.

Photo: WWF/Mauri Rautkari

Australia Forestry Project (NAFP) began work to supply the fodder, animal bedding, fuelwood and timber required by the economy in the two districts by increasing the number and productivity of trees grown in the forest or on private land.

The effort has been a joint development project of the Australian International Development Assistance Bureau (AIDAB) and the Government of Nepal, managed by Anutech – a company owned by the Australian National University. But the project works through the Nepal District Forest Offices. Thus only a small number of expatriates are involved.

Modest beginnings

Given a high degree of ignorance and uncertainty about the needs and chances of success, the project began in only two of the region's 175 panchayats. The project staff extended the programme only at the invitation of panchayat leaders. As of 1990, 137 of the panchayats in Sindhu Palchok and Kabhre Palanchok Districts are involved.

The number of tree nurseries has grown from five in 1978 to 123 in 1989. The annual area planted or enriched has increased from 100 ha to 2000 ha in 1988. In all, 12,557 ha of plantations have been established, 60-70% estimated to be effective forest. More than eight million seedlings have been distributed to individuals. On the basis of estimates using extrapolations, the project has established 7,500 ha of effective forests and farmers on their private initiative have probably added another 7,500 ha.

Fodder trees are the most desired species. But they have proven very difficult to establish on denuded sites. The project opted to plant chir pine *Pinus roxburghii*, a native tree

that was little favoured but established itself readily on degraded sites. Project workers were surprised to find that on many sites a wide variety of broadleaved species began to appear among the pines. These species included those preferred by the local users.

The pines appear to act as a social and ecological nurse crop: a social nurse crop, because they convert the land use category of the site from grazing or barren land to forest, so that the farmers themselves prevent grazing or browsing and control other uses. As an ecological nurse crop, the pines provide a suitable environment for the growth of more sensitive species from old stumps, roots or seeds.

Plantation sites were created only with local agreement and by local people receiving daily wages. The new forests are protected more by the will of local people than by the 664 paid watchers, who themselves live locally. Local forestry committees have been set up to help develop management plans and distribute benefits. By the end of 1989, 16 local management plans had been completed and approved. Over 20 others were in preparation. With the growth of local management, the ratio of forest watchers to hectare of forest has been halved.

Other rewards

The project provides materials such as pipes, roofs and cement in exchange for village labour in planting trees. Khanalthok in Kabhre Palanchok received 3 km of irrigation pipe in exchange for planting 60,000 seedlings. The new supply of irrigation water enabled the village to turn around its economy by converting maize fields to garlic production for sale in Kathmandu.

The project has also provided education and training to help increase the number of professional forest officers and other staff. It has funded undergraduate or graduate education for 10 professionals, trained 730 local people as nursery supervisors, forest guards or workers, and has provided 107 girls with secondary education scholarships.

A major advantage has been the flexibility built into the project to enable it to evolve from a conventional forestry scheme – in which professional foresters manage resources for the benefit of forest users – to a community forestry project in which the forest users become the managers.

This aspect of the project has had enormous demonstration value, significantly contributing to the design and evaluation of community forestry projects throughout Nepal. The 1989 Master Plan for the Forestry Sector provides for 47% of the total investment in forestry to be spent on community forestry over the next 20 years.

– Christine Prescott-Allen

Christine Prescott-Allen is a photographer, writer and consultant on animal and plant diversity and its sustainable use. She and her husband, Robert, are partners in PADATA, a consultancy firm specializing in research, information and photography on plants and animals and their sustainable use, and in strategies for sustainability.

These summaries were based on full-length case studies prepared for the Canadian International Development Agency, of projects in the tropics that: make use of native wild species; conserve those species and their habitats; and provide a direct and sustainable economic benefit to local people. The report is being revised for publication. Requests for copies of the final report should be sent to the author at PADATA, 627 Aquarius Road, RR2, Victoria, British Columbia, Canada V9B 5B4.

III. Questions for the future

At the 1990 General Assembly, IUCN members will review the place of wildlife utilization within wider programmes of conservation and sustainable development, and launch new activities in this field.

The previous papers have discussed how economic values may be assigned to wildlife, how vital scientific understanding is for sound management of wildlife use, and how well-controlled projects can bring benefits to local communities and at the same time advance conservation.

But for many IUCN members – and for conservationists around the world – there are ethical questions to be faced. We also need some clear criteria to guide IUCN in its work. In this chapter, Steve Edwards considers what these might be, and describes two projects that put them into practice.

Sustainable wildlife use:

There are five key questions we need to answer in shaping IUCN's future work on sustainable wildlife use:

1. Is wildlife utilization ethically justifiable?
2. Is wildlife use really compatible with conservation?
3. Can wildlife use projects be justified if they compete with traditional activities like farming?
4. What makes a sustainable use project successful?
5. What standards should IUCN apply when setting up a project?

Ethical justification

As IUCN's Working Group on Ethics and Conservation says, we must respect nature and the right of other species to exist. We can use the many values inherent in the natural world so long as we do so sustainably, equitably, and in a caring way.

Sustainable wildlife use is not just a way of legitimizing sport hunting. The case studies and reports presented in this issue make this clear: venom-collecting, paper-making, butterfly-ranching, mussel farming, crocodile harvesting and frog-breeding. Sustainable use of wild animals and plants is critically important to many traditional societies – for their way of life and their cultural identity if not their survival.

We cannot exclude hunting – and trapping – any more than we can exclude fishing. But hunting and all other forms of utilization must meet the criteria of the World Conservation Strategy: they must not endanger species or populations or disrupt ecosystems. The emphasis is on sustainability.

Many IUCN members will add another condition: the methods used must be as humane as is practicable.

Compatibility with conservation

Most of IUCN's programmes – for example on wetlands, tropical forests, or the Sahel – seek to conserve natural systems and biological diversity as an essential foundation for the future. Within these programmes many projects involve use of wild resources and efforts to make that use sustainable. Local people often relate more closely with individual species than with broader, more complex ecosystems. Species use projects can therefore be easier to implement, and valuable as leads into more complex, integrated management programmes.



The demonstration project described later on, frog breeding, illustrates how such an initiative enhances integration of our different programmes.

Frog harvesting is not being carried out sustainably. Experts in the SSC network have found the solutions to the major problems, without endangering the wild populations. Applied research is now needed to develop technology that is compatible with the culture and traditions of the local communities. Our Population and Resources Programme and the Asian desk of Field Operations Division have both made substantial contributions to the project design. The project would be anchored locally by an affiliated NGO. Like all projects, we shall demand further that it contribute to conservation and bring benefits to the local communities.

It doesn't pay: cattle ranches in Brazil can't cover even half their costs.

Photo: WWF/Mark Edwards

Compatibility with farming

As for competition with "traditional" uses like farming, wildlife utilization is a traditional way of earning revenue! Besides, many people do not have the agricultural option.

And farming – which can mean replacing diversity with monocultures and rainforests with beefburger cattle – is not necessarily a good economic, let alone environmental, option. For example, revenue from Brazil's cattle ranching on sites that were previously forested represents less than 45% of the ranch operating costs.

Those countries that have emphasized harvesting of natural wildlife resources have had considerable success in controlling foreign debt. It may be more advantageous for a country to concentrate on developing effective wildlife management systems that contribute to their economic development rather than converting these resources to agricultural crops. At the very minimum these countries should not trade their long-term economic worth for short-term profits.

Criteria for project success

The first criterion is that a sustainable use project will help to conserve the species concerned in the wild. That might seem obvious but we know of crocodile ranching projects that are completely sealed off from the community: crocodiles are bred from birth to death within the farming compound, they are owned by outsiders, and there is no contact with villagers except for a few employees.

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Other ranching projects are no more than ways of "laundering" wild harvesting that is carried out with no thought of conserving the wild populations. The local people have no say in the management of the resource and they see precious little benefit. So far as we are concerned, these projects are failures from the start, no matter how long they survive.

We have developed a crocodilian management project in Nicaragua, where today virtually all the market value of the skins is going to the exporters and tanners: we want to ensure more goes to the people to encourage more effective management of the resource. That is in line with our second principle: a sustainable use project has to materially benefit the human population that has the closest contact with the wildlife resource.

Other standards for projects

There are five other criteria which IUCN seeks to apply:

First, the project should be a model which can be followed elsewhere.

Second, the government has to be involved in, and committed to, the project and its implications.

Third, local organizations must be engaged. Usually this means joining up with a prominent NGO in the country where the project is implemented. The field work in all IUCN wildlife use projects are carried out by specialists from the country whenever possible. For example, IUCN is working in India with the Madras Crocodile Bank; in Nicaragua with IRENA

and ABEN; and in Guyana with the Ministry of Agriculture. All have a track record of commitment to local community action.

Fourth, the local community has to give a commitment to cooperation. This means that potential benefits need to be sufficient to sustain local commitment.

Fifth, we need legal controls and international support. It's no good trying to build up a crocodile harvesting project, for example, if illegally acquired skins are allowed to compete on the national and international markets, or if people can move in and undercut a sustainable use project by producing cheaper or larger numbers of skins by ignoring government regulations. In many developing countries, that means helping the governments build the institutional capacity to control illegal harvesting, and it means persuading the government to accept the regulations of CITES, and then helping the local authorities to implement those regulations.

Conclusion

IUCN believes that sustainable wildlife use has an important part to play in the development of many countries. It can often be ecologically sounder, as well as far preferable in conservation terms, to converting wild habitats to ill-suited farmland. But we can only succeed if we address the full spectrum of biological, habitat and social requirements. Our role is to advise, stimulate, and help local people build their own successes.

Two new projects are under consideration by IUCN which aim to bring about the sustainable utilization of two species representing groups long exploited by humans: frogs and caiman.

Recent discoveries about an Indian frog* have removed a major argument against its controlled harvesting for restaurants. Can a system be developed that will prevent over-exploitation and encourage conservation?

Frogs' legs – a new look at an unsustainable harvest

The international market for frogs' legs has led to widespread indiscriminate and uncontrolled harvesting of several species of frogs throughout the world. In 1983 Bangladesh, Indonesia and India exported 10,000 tonnes, representing over 250 million frogs, mainly to Europe and North America.

India banned exports in 1987 after harvests averaged 3,400 tonnes a year between 1976 and 1983. This export market

was based on uncontrolled wild harvesting of three species. The excessive harvesting meant that frogs were no longer controlling insects and other invertebrates that feed on agricultural crops. More pesticides had to be used instead. The long-term impacts on the environment more than offset the immediate economic benefit from the export – worth US\$702,650 in India at present exchange rates during the peak year of 1981.

While exports have been banned from India and technically from Bangladesh, wild harvesting continues unabated. Today Indonesia is the principle source of supply. Farming operations in Taiwan serve the local markets and Brazil has a government-subsidized farming scheme. By contrast, all India's frog species are listed on Schedule IV of the Wildlife Protection Act, requiring Government permits for any organized collecting of the species.

However, the Indian trade represented a significant source of income for rural communities, particularly the Irula tribal peoples of Tamil Nadu state in southeastern India. These people have survived on subsistence hunting of a wide variety of wildlife for generations. As wildlife resources have become more scarce, these indigenous people have been limited to catching so-called "pest" species, such as snakes, termites and rats for food and as a source of income (see article on snake venom, page 18).

The few frogs still collected by Irula tribals are for food and represent a significant source of protein in their diet. Any controlled management programme that can supply frogs' legs to the established market will contribute to the conserva-

Edible frogs: can controlled harvesting save them?

Photo: WWF/F. Vollmar



* As a protection against irresponsible copying of the project model, the species is not identified.

tion of other frog species by reducing demand for wild harvested specimens.

But while management of captive and/or wild populations could provide an important source of income to rural communities, it is essential that necessary controls be implemented to prevent a resurgence of over-exploitation.

Herbivory helps

Recent research by Mr Indraneil Das at the Madras Crocodile Bank, a charitable organization set up to conserve natural resources through local sustainable utilization projects, has indicated that one of the species traditionally exported for frog's legs is predominantly herbivorous throughout its adult life. It feeds on a variety of aquatic plants.

While this may suggest it plays no role in controlling agricultural pests, it may be useful in reducing aquatic weeds in ponds, small rivers and lakes. Further, its diet may enable farmers to keep high population densities in small ponds, making such enterprises more cost effective. Cannibalism is common among other frog species at high densities.

By reducing demand for wild-harvested insectivorous frogs, these other populations should increase, resulting in a reduced need for pesticides.

At the moment villagers lease ponds to Irula tribal people to raise fish that are sold to the Madras Crocodile Bank.

Along the frontier between Nicaragua and Costa Rica IUCN's Central American Regional Office (ORCA) is coordinating creation of an International System of Protected Areas for Peace (SI-A-PAZ). The hope is to stabilize peace efforts in the region by providing means for rural people of both countries to use the natural resources sustainably while providing needed protection to the wildlife and habitat.

Crocodilians for community development

Los Guatuzos is a swampy region of approximately 1,000 sq km on the southern edge of Lake Nicaragua and the Costa Rican border. Access is very difficult. The region can be reached only by the few navigable rivers flowing from Costa Rica into Lake Nicaragua.

The numerous swamps and rivers make the region ideal for crocodilians, and the local people, who mostly retreated to Costa Rica during hostilities between the Contras and the Sandinista Government, had a tradition of hunting caiman.

The spectacled caiman *Caiman crocodilus fuscus*, one of Nicaragua's two crocodilian species, is listed on Appendix II of CITES. Products from this species can be traded internationally if the country of origin can attest that the level of harvest for export is not detrimental to the survival of the species.

Although crocodilians are known to be important for maintaining the aquatic ecosystems they inhabit, the first concern of people returning to the Los Guatuzos region will be survival – most likely at minimal subsistence levels. It is highly doubtful that they will give any consideration to the conservation needs for the region unless they see some direct benefits within a relatively short period of time.

Given the present economic conditions in Nicaragua, it is feared that surviving wildlife resources may be particularly vulnerable to exploitation. Because crocodilians sometimes

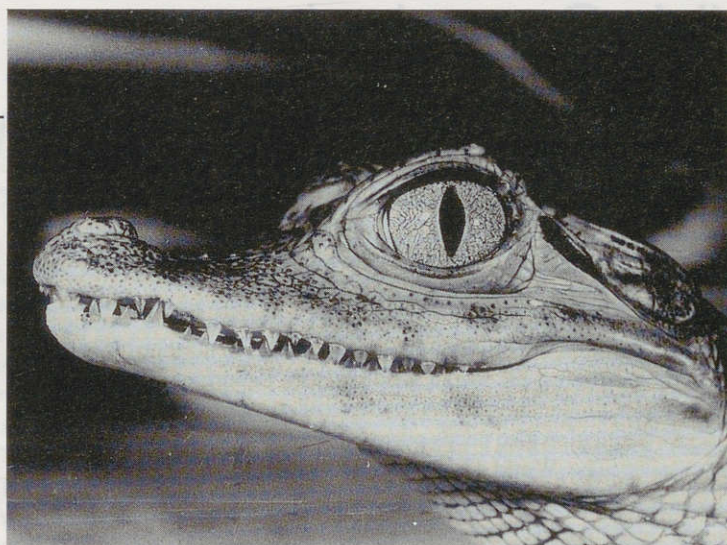
Villagers benefit from the leases. The Irula earn income from the sales. These ponds could be used to raise frogs, sometimes along with the local fish.

Project aims

The first stage, which would be managed by Mr Das, would assess the feasibility of the concept and provide guidance for full-scale implementation. Research will aim to discover whether adults can be maintained at high densities under controlled conditions and the impact on larvae and juveniles. The project would also try to identify conditions that affect growth rates and evaluate methods to enhance egg fertilization. There will also be a preliminary evaluation of the potential for using the frog to control aquatic weeds.

The Madras Crocodile Bank would provide local management for the feasibility assessment. A building for the laboratory and land would be made available from the Crocodile Bank for renovation and construction of needed facilities.

This project offers a rare opportunity to take advantage of a trait – herbivory – in an unusual frog species in the interests of conservation for sustainable development.



Wary eye on the future: a young spectacled caiman.

Photo: WWF/Hans Dossenbach

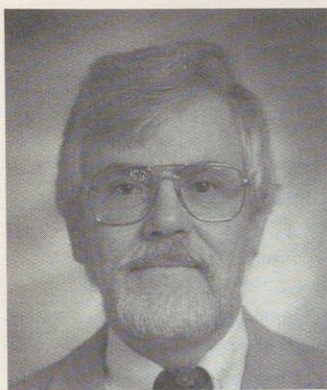
attack humans or domestic livestock, they are often killed indiscriminately. In some areas, crocodilians are inaccurately believed to be responsible for reductions in fish populations, the main source of food for local inhabitants.

An IUCN project developed through ORCA with Nicaraguan authorities and a local conservation group proposes harvesting of caiman from the wild to supply the national and international market for reptile skins. The project will be initiated at the Los Guatuzos Wildlife Refuge, established under the SI-A-PAZ initiative.

Multiplying profits

Reptile skins are marketed through San Carlos, a village of 9000 people at the southeast corner of Lake Nicaragua and the region's commercial and government centre. Some are tanned and made into shoes, purses, belts and other small items for final sale in the capital, Managua.

At present hunters are paid US\$2 per foot per skin. Skins are sold for an average of US\$25 each. When exported to Europe, Japan or North America and fully tanned and polished for sale to manufacturers of final products, they are



Steve Edwards is Senior Coordinator, IUCN Species Conservation Programme.

worth approximately US\$150, an overall increase of 300% in the value between the hunter and the sale of the fully tanned skin to the manufacturer.

The national government has authorized wild harvesting of crocodilians over 1.2 metres (three to four years of age) during a designated season (July to December), without being able to carry out much direct control. Skins are averaging less than a metre in the San Carlos market; many are not properly tanned and therefore not likely to last very long.

In the first 18 months the project will try to find out whether there is a sound scientific basis for a programme. Crocodilian populations and other wildlife amenable to sustained management, such as tree species and fish, will be surveyed. There will be a full evaluation of the social and economic impact of the project on the rural people in Los Guatuzos and San Carlos. After the field assessments, a technical workshop in

San Carlos will develop conservation and management recommendations for the wildlife in the Los Guatuzos region.

The CITES Secretariat is cooperating to ensure that proposed activities are compatible with its regulations. It will be particularly important to identify and stop international traffic in illegal skins that may be originating in Nicaragua. Otherwise, the development objectives could be undermined.

The caiman project innovates by taking into account the impact on the wider ecosystem rather than just the population being harvested. It should help in the development of a model wildlife management programme that could be applied to other protected areas in Nicaragua and Costa Rica.

— Steve Edwards

The caiman project was chosen for consideration after IUCN reviewed programmes for sustainable use to be carried out with the Instituto de Recursos Naturales y Medio Ambiente (IRENA), responsible for protection and management of Nicaragua's wildlife, and the Asociación de Biólogos y Ecológicos de Nicaragua (ABEN), a leading non-governmental conservation organization.

IV. Conclusions

Many people living in developed countries – and especially conservationists – are unhappy at the idea of wildlife utilization. This is probably because in those countries people no longer depend on wild animals (except fish) for food, and because many find repugnant the sport hunting that is the principal reason people kill wild birds and mammals. IUCN must respect these sincerely held views.

But in developing countries, and among a number of groups, especially indigenous peoples in northern developed societies, the use of wildlife is an important element in the battle for survival and a source of economic livelihood. Their situation also needs our collective respect.

The World Conservation Strategy has established clear guidelines in this matter. It is legitimate (although, of course,

far from obligatory) to take a crop from a wild species provided that it is done sustainably, endangering neither the species (or population), nor dependent species, nor the stability of the ecosystem. It is important that such harvesting be done humanely, be monitored, and be protected from extraneous economic pressures that could provide overwhelming incentives to abandon sustainability in favour of immediate wealth.

Ecologically speaking, there is much to be said in favour of cropping wild species sustainably under tight controls, because this involves far less disruption and loss of biological diversity than conversion of natural vegetation to pasture or farmland. Wild species were shown, in pioneer studies supported by IUCN long ago, to be more productive than substitutes like cattle when fed native vegetation in many tropical areas – and to demand far less management effort. The fact that humanity has domesticated and used intensively only a trivial fraction of the world's biological diversity is a sign of our limitations rather than of any natural law.

Moreover, wildlife utilization does not have to be destructive. Natural areas, cropped by nothing more savage than a camera, are the principal foreign exchange earners in many developing countries. Forest products like fruit, nuts, latex and foliage can be taken sustainably without harm to their sources. Selective logging and animal harvesting can be done in ways that leave hardly a mark on the overall system.

Sustainable wildlife use also represents a way of conferring an economic value on wild habitats and non-domesticated species of both plants and animals. It offers both non-commercial and commercial benefits to local communities, and a prospect of more harmonious co-existence with nature than could be achieved through the imposition of alien land-use methods, with sweeping ecological changes and their many attendant risks. Of course there are areas where the development of farming, agroforestry or plantation forestry is the optimal land-use. But elsewhere, nature in all her diversity, used sustainably, offers the best prospect for the human future. IUCN has strong arguments for upholding its long-established commitment to the responsible use of wild nature.

Martin W. Holdgate

Wildlife hunting with a camera at Kinabalu National Park, Malaysia. Tourism is a major source of foreign exchange in many developing countries.

Photo: WWF/K.J. Lee





Biebrze flood plain and marshes, Poland (photo: WWF/Hartmut Jungius).

IUCN and Eastern Europe

An end to isolation

International cooperation in environmental conservation was not easy under the Communist regimes of the past in Eastern Europe. Restrictions on foreign travel and on visits of specialists from abroad, deep distrust of the "capitalist" or "imperialist" West, and desperate efforts lately to hold back information about the rapidly deteriorating environmental situation were very serious obstacles.

But even between the East European countries themselves collaboration has been far from ideal: in all its existence CMEA – the Council for Mutual Economic Assistance – did not succeed in creating an effective environmental agency.

IUCN has been the only international organization able to claim any success in cooperation with this part of the world. East European countries have regularly taken part in important IUCN meetings. IUCN was the first international organization to work with the German Democratic Republic, even before the GDR joined the United Nations.

In 1966, the East European Regional Committee of the IUCN Commission on Education was established in Prague, Czechoslovakia, the first internationally organized body of conservationists from the region. A few years later the Committee on Ecodevelopment of Cultural

Landscapes was created by the IUCN Commission on Landscape Planning.

Neither of these Committees is concerned only with its own region. On the contrary, they have developed broader international cooperation as far as possible.

These were early components of the later, integrated IUCN East European Programme (EEP). The Rockefeller Brothers Fund provided help with its first steps. Discussions among a number of East European representatives were initiated in Moscow in 1987. The programme itself was launched at the 17th IUCN General Assembly in San José, Costa Rica, in February 1988.

These dates indicate progressive thinking on the part of IUCN, which took action some years before the great political changes in the East European Region – and in some modest way even contributed to those changes.

The East European Programme Task Force has met several times, bringing together specialists – mainly representatives of IUCN member organizations – from most countries in the region.

Our first achievement has been publication of national environmental status reports in 1990. They were put together at a time when in many countries it was dangerous for the authors to publish accurate information. The reports now need to be brought up-to-date, but the basic data and even the assessments remain valid.

At a meeting at Moscow in February 1990, the group – now renamed the IUCN East European Programme Advisory Group – started to develop projects. Among the first was the organization of the IUCN international conference in the Krkonose/Giant Mountains National Park in Czechoslovakia on the theme of "Parks, Pollution and People". Other projects under development include environmental conservation in the Danube basin, establishment of project development and implementation units in various countries and a project to examine the environmental impact of agricultural intensification.

When IUCN defined the region to be covered by its East European Programme, its rationale was, frankly, to some extent political. But we recognize that Germany and Czechoslovakia, for example, are more closely linked in an environmental sense than, say, Czechoslovakia and some parts of the USSR.

The present East European Programme does not seek to isolate the region and in fact tries to make it a meaningful vehicle for European and even global integration in environmental conservation.

Jan Cеровsky

Dr Cеровsky is an IUCN Regional Councillor and Chairman of the IUCN East European Programme Advisory Group. He is based at the Czech Institute for Nature Conservation in Prague.

View from the Union

Over the past year, the IUCN East European Programme has been working against a background of deep political change. The political and economic ground for reunification of Europe is being prepared but common environmental quality still lies a long way ahead.

Publicly available statistics are now confirming the worst fears about environmental catastrophe in certain areas of central and eastern Europe.

There is a policy debate among donors about the weight to give to market-led environmental improvement versus public infrastructure investment. Governments which hold the former view are vigorously encouraging private investment. The European Bank for Reconstruction and Development is currently expecting to allocate only 40% of its funds for public infrastructure projects.

However, economic development itself will be restrained by environmental conditions (for example, by water quality) and environmental improvement cannot be expected from the market system alone. EEP is hoping to influence western government aid policies in the direction of greater practical assistance for improving public infrastructure.

Even aid offered by governments specifically for the environment has more to do with promoting and consolidating democracy and pluralism than with the environment *per se*: hence the almost universal interest in working with NGOs.

The NGO movement is going through a phase of restructuring and self-education. Many are forming, equal numbers are disintegrating, and others are metamorphosing into political parties. It is still difficult to identify nationally based, credible and durable groups.

EEP will continue to obtain support for NGOs for training through on-the-job experience, and to promote membership of IUCN as well as links with other international and national NGOs. However, it is the governments which are currently engaged in formulating new environmental policies and strategies. EEP is working closely with most of them, providing assistance and advice.

Scientific institutions will be hit hard by funding cuts and personnel reorganization as a result of the political changes. While there is now the freedom to work and publish on all subjects, isolation is still a problem because of lack of funds for travel and the lack of computer and communications equipment. Hierarchical habits tend to block wide dissemination and discussion of information. EEP has provided contracts to scientists, paid in hard currency,



Members of the IUCN mission to the Danube Delta had a chance to study and discuss some of the area's most pressing environmental problems (photo: IUCN/Aitken Clark).

such as for a grasslands survey, an agriculture project and a review of EIA provisions, and is working hard to increase East-West scientific contacts.

There is a strong belief among East European scientists that if only scientifically trained people were in power, environmental problems could be solved. Many scientists now hold high government office. IUCN, with its wide scientific networks, will watch these developments with great interest.

...and into the future

Catching up is not all one way. IUCN is looking forward to a raised regional consciousness on the part of its northern, western and southern European members and partners.

The ground has been laid.

*— Liz Hopkins and
Zbigniew Karpowicz,
Programme officers,
IUCN East Europe Programme*

Views from the region

What are East Europe's major environmental problems? What are the new governments planning to do about them, how do they see their future, and how can IUCN help? Ministers from six countries were invited to give their views. The following are excerpts from their replies, which are available in full from IUCN.

Czechoslovakia

The conservation of nature and protection of the environment of Czechoslovakia are among our government's most important objectives. Activities under the totalitarian regime left the environment in a catastrophic state. We are one of the most polluted countries in Europe and at the same time a major source of pollution. Now we have not only to solve the old environmental problems but also to avoid creating new ones. It is a very complicated task, especially since our economy is not very efficient and the costs of environmental protection appear to be astronomical. We are now looking closely at those costs and attempting to keep them within realistic limits.

We have just adopted our state environmental policy which describes our general approach and also proposes a set of projects designed to tackle the most pressing issues. First of all we are trying to set up a new structure for environmental protection and conservation of nature. This system consists of the newly established Federal Committee for the Environment headed by the Ministers of the Federal Government, and of the Czech Ministry and Slovak Commission for the Environment. These state institutions work as a "triumvirate". We are also supporting the development of the environmental protection movement among non-governmental organizations.

Up to the end of November 1989, international assistance had been close to zero. We need a basic systematic flow of information, broad personal contacts, training and perhaps technical assistance. We would like to keep good long-term contacts with IUCN and to strengthen them substantially.



*Josef Vavrousek,
Federal Minister for Environment,
Czech and Slovak Federative Republic*

Hungary

In Hungary non-governmental organizations play an important role in public awareness of our environmental problems and in many cases in solving them. The Government is striving to stimulate such activities and use its budgetary resources to help the NGOs.

The environment has been deteriorating in Hungary for a long time. The situation in more densely populated industrial regions is critical. Investment in environmental protection amounts to less than 1% of the Gross Domestic Product (GDP), while environmental damage reduces our GDP by 2-5%. The new government has initiated a fundamental change towards environmental protection and sustainable development. A law will be issued this year to enable local authorities to demand environmental impact assessments while the national system will continue to set and control environmental standards to govern large-scale polluters. Within a year a new law will declare as a fundamental principle the right of citizens to a healthy environment and the obligation to conserve irreplaceable natural values.

From 1992 onwards we intend to charge polluters in proportion to the damage they cause to the environment. We hope this will contribute to financing environmental protection. We expect to be able eventually to protect our environment with government expenditures of no more than 0.1% of GDP.

We are planning to initiate an environmental information system that will be available as widely as possible to our citizens and will assist our authorities in making decisions and in monitoring environmental processes.

As for relations with the World Conservation Union, Hungary's IUCN National

Environmental Education Committee has been working for 10 years now and it has promoted the setting up of a network of more than 40 field study centres. There are many areas where we can learn from the experience of developed countries, such as the environmental impact of unsustainable resource management, dealing with water and soil problems, and in reversing loss of habitats and biological diversity. IUCN could promote the getting-together of European countries to spread the knowledge that has been gathered about conservation of nature and natural resources. As befits its name, the World Conservation Union can also help us unite our efforts with other countries and organizations across the world so that we can implement sustainable development in the interest of our own and all future generations.



*Sándor K. Keresztes,
Minister for Environment
and Regional Development*

Poland

One of our first moves for environmental protection was to identify the 200 industrial plants that are causing the most environmental pollution. Programmes have now been agreed to limit emissions from 80 of the most hazardous. Long-term priorities are to update our environmental law and strengthen environmental protection.

The Polish Government will strive to develop a variety of forms of nature conservation and landscape protection. It plans to create a unified system of protected areas that will eventually cover 30% of the country.

Our environmental policy, as prepared for ratification by the Council of Ministers, lists priorities under three headings: investment, regulation and education. Financial resources should be concentrated on limiting new pollution, and we will impose strict environmental standards for newly installed equipment. Poland loses the equivalent of about 10% of its Gross National Product (GNP) as a result of environmental pollution. Investment in protection amounting to 4-5% of national income could improve our environment as rapidly as in Western countries. In the legal sphere, our priority is to eliminate gaps in the laws on emissions and create a consistent legal code. A monitoring system is already in place.

In education, we are counting on help from non-governmental environmental or-

ganizations so that people understand that consumption stimulates production which can in turn lead to environmental damage by small as well as large enterprises.

Environmental protection in Poland will prove costly. It will require, therefore, public consent and cooperation.

Our priority is to remove the obstacles to effective use of our funds (technology, institutional support, advice and training) or, where necessary, specifically to eradicate pollution endangering the health of the population. International help is a significant but not deciding factor. After all, such help offers advantages to the donor. By siting preventive investment at the source, the donor government is able to avert the higher costs associated with remedial measures on its own territory. Help offered by Western countries now comes to US\$200 million, though the amount so far committed does not exceed \$90 million. We estimate that eliminating major pollution in Poland will cost no less than \$20 billion.

Three of our national organizations are already members of IUCN. The changes currently taking place in Poland will greatly increase the importance of cooperation with the Union. We should like to see increased participation by Polish experts in the East European Programme and have IUCN experts take part in projects and training in Poland.



*Bronislaw Kaminski,
Minister for Environmental Protection,
Natural Resources and Forestry*

Romania

Nature conservation is one of the prime objectives of the new Government in Romania after several decades of neglect. We are now having problems in controlling air and water pollution, particularly from the chemical and metallurgical industries and from intensive agriculture. Clean-up costs will run into millions of dollars.

As evidence of the Government's commitment to nature conservation, the Danube Delta has been recognised as a Biosphere Reserve in spite of many difficulties. We hope eventually to put 5-6% of the country under some kind of protection and to nominate more than five separate areas as World Heritage Sites. Eleven new parks have already been designated since December 1989.

Some 25% of total government investment is to be spent on environment clean-



*Emblem of IUCN East European
Programme publications.*

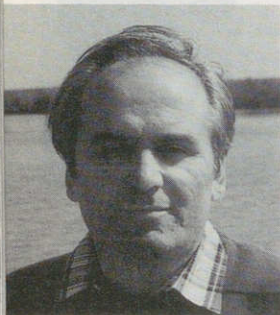
IUCN AND EASTERN EUROPE

up and protection projects over the short term. The challenge is to use this money in the right way.

Romania is trying to identify and understand critical ecological areas and also what we call national eco-regions, areas with ecosystems of national importance, for which we will develop research programmes. We consider it essential to have an integrated monitoring and research programme. Without this component it is not possible to know how to implement a long-term strategy of sustainable development. One further component is ecological education and the Government plans to offer special training in universities and schools.

However, in view of the current economic situation, we need international assistance to attain the standards we have set. European colleagues who help us will help themselves, too, because environmental health is a regional concern.

For political reasons, this help has not been forthcoming so far, but potential donor governments are now beginning to see that the reasons for holding back are not valid – why wait to see what happens when more good can be done by helping now? Within a very short time, more has been done than for several decades past. We are counting very strongly on support from IUCN, for example, in extending our protected area system. We also see in IUCN the opportunity to forge closer links with the rest of the world through membership of the Union's global networks.



*Angheluta Vadineanu,
Secretary of State for the Environment*

Yugoslavia

Yugoslavia has incorporated environmental protection into its development policies as one of five major criteria, the main emphasis being on prevention. We will bring our environmental regulations into line with international standards, particularly European ones, and we shall ensure compliance partly through legal measures, partly through economic incentives. Our economic policies will seek to discourage manufacturers from degrading the environment or depleting natural resources and to encourage them to adopt ecologically sound production practices.

The government will establish an energy generating system which more than in the past will be based on renewable sources, on rational and efficient use, and on energy

USSR

The Government of the USSR has prepared an all-Union Environmental Protection Law, and the Supreme Soviet has passed new laws on protection of animals, plants, forests, water and air. A new law on protected areas is in preparation. Nature reserves in the USSR today cover 0.25% of our total territory. The Supreme Soviet has adopted a Resolution which will require this area to be raised to 3% by 2000, and we know that to conserve our full range of biological diversity it should be 6%.

To organize the new reserves will require US\$1 billion over the next 10 years. We also, unfortunately, lack instruments to monitor conditions. We consider that saving our country's diverse ecosystems is a task of not only national but also international importance. For this reason, we are prepared to offer a number – maybe 30 – of our existing biosphere reserves for the establishment of international ecological stations, equipped with small laboratories and modest accommodation for post-graduate and short-term research by young specialists in ecology from around the world. In these "ecological villages" of 100-150 people we could test renewable energy systems and other environmentally sound technology that could be applied in large towns. For example, at desert stations, we could test solar energy systems and their use to power water purification plants.

We intend to raise the standard of ecological literacy. New school textbooks will place emphasis on nature conservation and ecology. An ecological dimension will be incorporated, as appropriate, in specialist courses for different professions.

We need a strong and independent scientific community, telling the truth in all cases, even if it is hard for the Government to accept. Fortunately, the democratic elections in the spring of 1989 brought a number of outstanding scientists to the Soviet Parliament as People's Deputies. Responsibility for aspects of environmental protection is being decentralized, but I have to admit to concern that natural resources will be damaged because of short-term self-interest during the initial period and transition to a market economy.

We appreciate the need for international links. We have bilateral agreements on environmental protection with 12 countries and two more are expected shortly. We are committed to a 30% reduction in sulphur emissions in the European part of the USSR, a 50% reduction in the territory adjoining Finland, and a 50% reduction in pollution discharged to the Gulf of Bothnia.

I think we should take a leading role in solving the ecological problems of enclosed waters such as the Caspian Sea, Aral Sea, Lake Baikal and Lake Balkhash.

By education and experience, I am a zoologist, geneticist and evolutionist. So, of all the organizations concerned with environmental problems, IUCN is much the closest to me from a professional point of view. I should like IUCN to press for governments to adopt legislation to protect animals and plants included in IUCN and national Red Data Books.



*Nikolai Vorontsov,
Chairman of the State Committee for Environmental Protection*

conservation. We shall develop industries that consume natural resources and energy more rationally and produce less waste.

The Yugoslav Government will shortly be presenting to the public its concept of long-term environmental policy and measures. People are demanding to be kept informed about the quality of the environment and to participate in making decisions. Accordingly, work has begun on a system for making information freely accessible.

Yugoslavia's active involvement in international environmental cooperation has brought obvious benefits. We are identifying ways to give practical effect

to that cooperation through specific programmes and projects at all levels.

IUCN's assistance could be invaluable in several ways:

- in developing sound indicators for sustainable development
- in elaborating accounting systems that reflect as fully as possible the importance of natural resources as depletable or renewable assets, and
- in developing market-based environmental techniques that can lead to the most efficient or least-cost results.



*Bozo Marendic,
Federal Minister for Development* □



Samuel A. Cooke accepting the Packard Award from Bing Lucas.



The Burhennes receive congratulations from Ted Turner, who chairs the Better World Society's Board of Directors (photo: Neal H. Bograd).

Better World award for Burhennes

Dr Wolfgang E. Burhenne and Dr Françoise Burhenne-Guilmin have been jointly awarded the Protection of the Global Environment Medal for 1990 given by the Better World Society.

"The Society annually awards five medals to give public recognition to groups or individuals – sometimes little known – who are making a real difference in the world," the announcement stated. Other 1990 medals go to Lech Walesa for peace advocacy and Greenpeace International for creative use of the media to heighten public awareness.

The awards were presented to the Burhennes in New York City at a dinner on 1 October. The Better World Society, founded in 1985, is a non-profit membership organization dedicated to making people aware of global problems which threaten life on our planet, including worldwide destruction of the environment. The Society produces and acquires practically-oriented television programming for international distribution.

Head of Management Services

Juan Garafulic joined IUCN in September 1990 as head of the Management Services Division.

Juan graduated from the Master of Administration Programme of the University of Chile, and qualified as an auditor and public accountant at the Technical University of Chile. From 1980 to 1986, he worked with the Swedish International Development Authority (SIDA) in Mozambique as Controller of the Mozambique-Nordic Agriculture Programme. He then moved to Bangladesh, where he served as the Administrative and Finance Officer of the Rural Employment Sector Programme (RESP) until 1989, after which he served for a year as UNICEF's Administrative and Finance Officer for that country.

Juan is married, to Sirkka Lisa. His two sons, Igor and Sacha, are attending university in Chile.



Parks merit award

Hawaii's Nature Conservancy and its chairman Samuel A. Cooke received the Fred M. Packard International Parks Merit Award from CNPPA in recognition of outstanding service in furthering the conservation of protected areas.

Over the past 10 years the conservancy has put nearly 20,000 ha under its protection, starting from nothing in 1980, while membership has increased considerably to 8,500 and funds raised have reached US\$13 million.

CNPPA senior advisor P.H.C. (Bing) Lucas presented the certificate and medal on 31 August at a ceremony at the Nature Conservancy's Honolulu headquarters. He noted that the medal is sparingly given: previous Fred Packard awards went to the retiring chief of Uganda's national parks for perseverance in support of conservation through the worst excesses of Idi Amin and posthumously to park rangers killed in Senegal by organized poachers.

The citation declares: "Samuel A. Cooke, chairman of the Nature Conservancy of Hawaii, has, over a period of ten years, demonstrated distinguished leadership. (...His) imaginative leadership was instrumental in the success of the Endangered Hawaiian Forest Bird Project and the Islands for Life campaign. Due to the Nature Conservancy of Hawaii, the State is a better place for nature as well as for people."



Communications chief

John Burke joined IUCN on 15 July 1990, as Head of Communications. Born in Tanzania, with his early education in Cyprus, Uganda, Ireland, Fiji and the UK, John took a joint Masters Degree in Economics and Business Administration at Trinity College, Dublin, in 1974.

After working in a merchant bank and as a marketing consultant, John spent nine years with Procter and Gamble in consumer goods marketing based in Switzerland and abroad. In 1986 he joined Rotovision SA near Gland as general manager of a Swiss company specialized in publishing and distributing applied visual art books, magazines and related services.

John is 37 and Irish by origin; he and his wife Susie have two children.

Sahel projects manager

Jip Ketel of the Netherlands has joined IUCN as projects manager for the Sahel Programme. He worked for the previous 4½ years in the Sahel as regional representative for NOVIB, a Dutch NGO.

Jip holds degrees in tropical agriculture from Deventer College and in business administration from Nijenrode International Business School in the Netherlands. He has gathered a wide variety of field experience since his career began in 1974: as desk officer in rural development for a Turkish NGO; as a Dutch Volunteer in Cameroon; as project director for Euro Action Accord in Tanzania (and later as project officer for East Africa at its London head office); and as a field representative of Oxfam (UK) in the Horn of Africa.

Jip's wife Mikolein has also taken a post in Gland as administrative assistant in Management Information Services with WWF International.



The Last Rain Forests

Introduced by David Attenborough. General editor: Mark Collins in association with IUCN.

The Last Rain Forests is the first popular reference book to map, illustrate and describe fully the changing face of the great rain forest regions of tropical America, Africa and the Orient, and to offer a constructive global view of what needs to be done to save them.

Making dramatic visual use of maps, photographs and artwork, it covers the peoples of the rain forests, their rich wildlife heritage, their natural resources and the economic pressures that lie behind their unsustainable exploitation. The book ends with an information packed section on present and future conservation schemes.

This is the first in a series of conservation atlases to be published by Mitchell Beazley in association with IUCN; the next will be on oceans.

ISBN 0 8 5533 789 3, 1990, 200pp., 210 colour photos, maps and diagrams, £17.99

WALIA - l'approche, le guide pratique

Projet de sensibilisation environnementale en milieu scolaire.

The bulletin *Walia* was launched in 1985. This 48-page brochure in French is the outcome of the experience gleaned from producing material designed to stimulate environmental awareness among school children in Mali, using a minimum of tools and a maximum of imagination.

For further information, contact the IUCN Sahel Programme at headquarters.

Crocodiles

Proceedings of the 8th Working Meeting of the Crocodile Specialist Group of the IUCN Species Survival Commission, convened at Quito, Ecuador, 13-18 October 1986.

A total of 48 papers and audio-visual presentations on the status of crocodilian populations, management problems and successes, legal and illegal trade, and the latest research developments, were delivered at this meeting. Of these, 17 were submitted for publication in this volume. Phil Hall was scientific and managing editor.

ISBN 2-88032-968-X, 1989, 204pp., photos, tables, maps. £10.00/US\$20.00

Crocodiles

Supplement to the Proceedings of the 8th Working Meeting of the Crocodile Specialist Group of the IUCN Species Survival Commission, convened at Quito, Ecuador, 13-18 October 1986.

This volume contains two papers both focusing on Australia presented at the meeting but not published in the Proceedings: "The distribution of *Crocodylus porosus* and *C. johnstoni* along Type 1 tidal waterways in northern Australia and survey of the upstream non-tidal sections of the Roper River, 1986," and "Summary results

of surveys of the tidal waterways in the Kimberley of western Australia during the years 1977, 1978 and 1986."

ISBN 2-88032-969-8, 1989, 90pp., tables, maps, graphs. £5.00/US\$10.00

Crocodiles: their ecology, management, and conservation

A special publication of the Crocodile Specialist Group of the IUCN Species Survival Commission. The 14 papers in this volume were originally prepared as chapters for a publication which was to be commercially published.

ISBN 2-88032-987-6, 1989, 308pp., tables, maps, graphs. £10.00/US\$20.00

Crocodiles

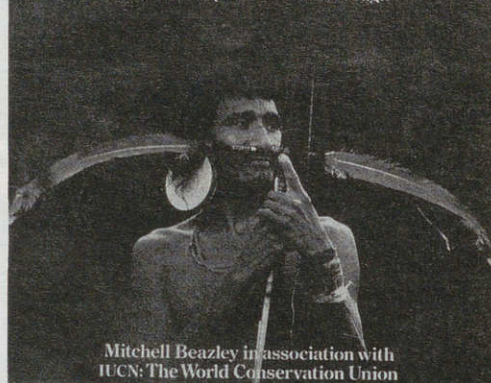
Proceedings of the 9th Working Meeting of the Crocodile Specialist Group of the IUCN Species Survival Commission, convened at Lae, Papua New Guinea, 19-21 October 1988.

These two volumes are the record of the presentations and discussions that occurred at the 9th Working Meeting. They are un-

THE LAST RAIN FORESTS

A Mitchell Beazley
World Conservation Atlas

Introduced by David Attenborough



Mitchell Beazley in association with
IUCN: The World Conservation Union

edited and unreviewed, and the articles are presented alphabetically by author.

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Candidates should be senior professionals with a PhD (or equivalent) in a biological or social science and a proven record of success in the field of conservation and sustainable development. They should have international experience, having worked in more than one developing country, and should also have proven managerial ability. They should be proficient in English and French, and preferably also in Spanish.

The Assistant Director General will be based at Gland, Switzerland, but will be expected to travel extensively. Salary will be between SFR 135,000 and 175,000 depending on qualifications and experience.

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Fuller details are available on request.

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The Calendar will be resumed in the next IUCN Bulletin.