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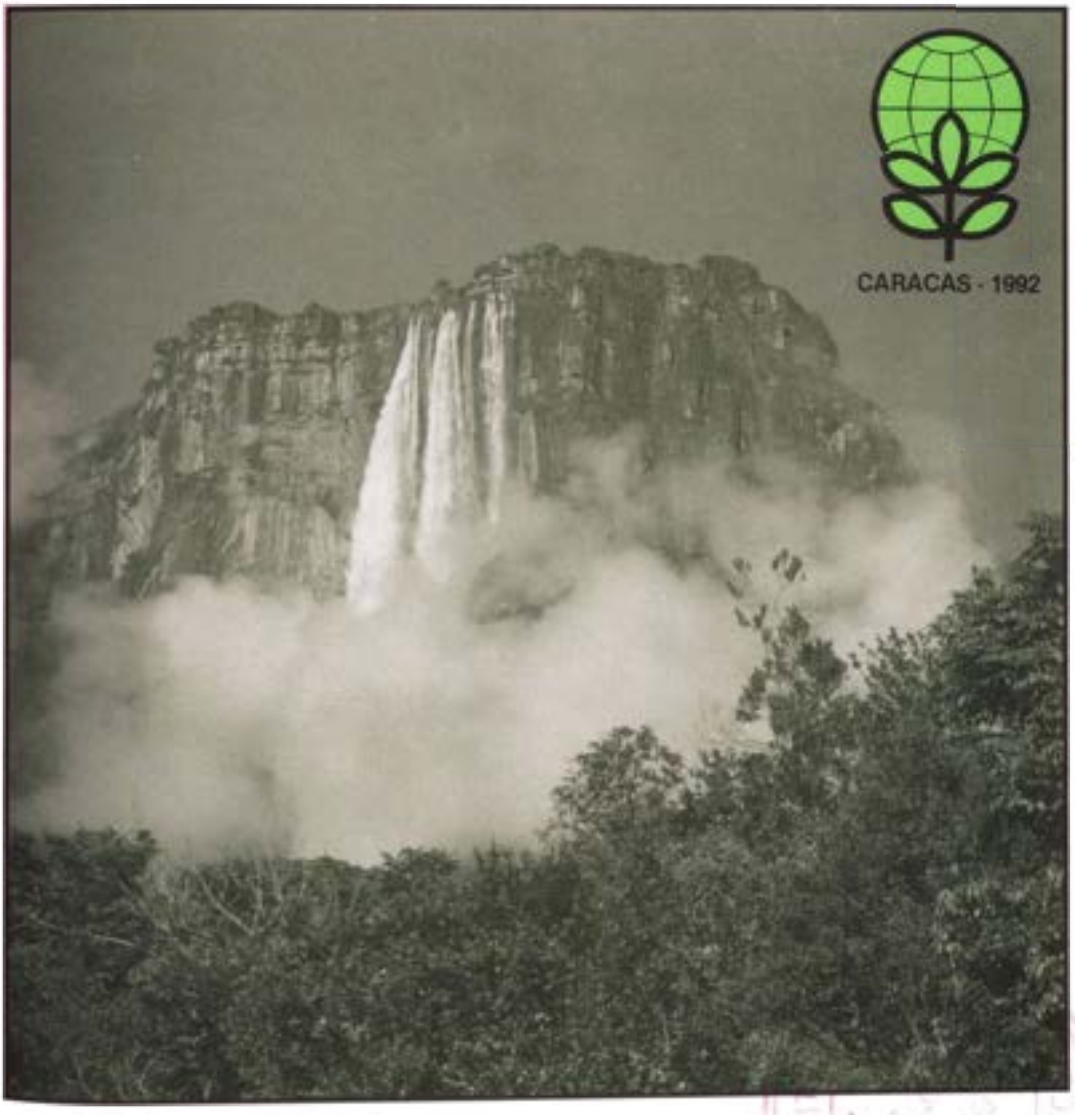
PARKS

The international magazine dedicated to the protected areas of the world



LATIN AMERICA

Vol 3 No 1 January 1992

PARKS

The international magazine dedicated to the protected areas of the world

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PARKS is published with the following aims:

- to demonstrate the contribution which protected areas can make to sustainable development;
- to improve the quality of protected areas management;
- to communicate protected areas information amongst all involved;
- to promote the management of protected areas as a profession.

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EDITORIAL

Jeffrey A. McNeely
Chief Conservation Officer, IUCN

Every ten years the professional community involved with protected areas meets at a World Congress to discuss the major problems facing protected areas and the actions that are required to address these problems. This decade, the Congress will be held in Caracas, Venezuela, the first in Latin America.

The Congress comes at an opportune moment in the history of protected areas. Demands on resources are increasing quickly, due both to greater consumption among the affluent and rapid population growth among the poorer. As demand on nature's productivity increases, conflicts between conservation and development inevitably arise.

The main issue at Caracas will be how to manage the conflict between different uses for sites which are important for conservation. Some may argue that strict protection is the only option; that opening protected areas to human use will inevitably lead to degradation. Others will argue that protected areas will survive in the long-term only if local communities support their existence; and that this implies greater economic benefits from the protected areas being provided to the local people. At a global scale, both of these perspectives may well be correct.

But protected areas are sites and each requires an approach to management which is appropriate for the specific conditions of that site. This means that protected area managers will need to be much more flexible and adaptable in the future than they have been in the past. As a result the Caracas Congress will be designed to provide the management tools needed by the modern protected area manager. Major tools to be developed include: improved methodologies for applying science to management; new applications of information management, at both site and system level; new approaches to ensuring that protected areas are an integral part of the rural landscape; improved training for protected area managers; new methods for incorporating protected areas into national educational curricula; new approaches to providing information to visitors to protected areas; systems planning technologies; and many others. This partial list indicates the broad range of management tools now becoming available.

It may also be timely to consider the roles of the various levels of government. Which protected area responsibilities should be held by the central government and which should be devolved to lower levels of government? What are the checks and balances required at these various levels? Further, we also need to seek ways to involve the private sector much more creatively, both as managers of sites and as supporters of sites. We need to build a stronger constituency among other sectors of society.

This is a particularly opportune moment in history, as world leaders become increasingly concerned about the state of the environment. The "Earth Summit" will be held in Rio de Janeiro shortly after the Congress, and will receive our recommendations for possible inclusion in the "Agenda 21" plan to be adopted by the Statesmen. Governments have recently established a major new "Green Fund", managed by the World Bank, UNDP and UNEP, with several hundred million dollars available for conserving biodiversity. *Caring for the Earth* was recently launched by IUCN, WWF and UNEP, suggesting the policies that are required to see our civilisation safely into the 21st century. *The Global Biodiversity Strategy* will be launched at Caracas, going into more detail about the specific actions required to conserve biodiversity. All of this sets the stage for the Caracas Congress. It is now up to its participants to identify the actions needed, specify the tools that will be required and send the strongest possible message from our profession to the politicians who determine the priorities our society must address.

Editor's note

To mark the 4th World Congress on National Parks and Protected Areas in Caracas, this number of PARKS was largely compiled in Venezuela in Spanish. This was made possible through the initiative of Cristina Pardo, Regional Vice-Chair of CNPPA for South America and Director of Inparques, Venezuela. Articles were then translated into English under the supervision of the Editor, and several regular PARKS items were added.

This number of PARKS also appears in Spanish. The extra costs of producing the Spanish edition were generously provided by the US National Parks Service.

PROFILE

José Rafael Garcia retired from the National Parks Service of Venezuela in 1986 after being at the front of the Service for 28 years. Today he works as an Adviser to the Presidency of the Instituto Nacional de Parque – INPARQUES (National Institute of Parks), where he continues to work for the defence of the country's natural heritage. His efforts have been recognised in Venezuela with the Henri Pittier Order and the W.H. Phelps Prize. Internationally, he has received the Orange Nassau Order of the Netherlands, the Golden Ark Honour of the Netherlands and the Fred M. Packard Merit Medal awarded by CNPPA in 1982 at the celebration of the III National Parks Congress in Bali (Indonesia).

Profile: From your new position in which one might call "The Council of Notables" and which is held in high regard in Venezuela on the subject of environmental conservation, what can you tell us about the National Parks in the country.

García: The conservation movement in our country, as it is understood today, was initiated in the second decade of the century and it was without doubt the wise Henri Pittier who laid the foundation for the achievements that have been made regarding environmental protection in Venezuela.

Our National Parks system today has 39 National Parks and 17 Natural Monuments, which cover approximately 14% of the nation's territory; together with the other decreed protected areas, this places us on the list of 11 countries in the world that have more than 15% of their territory protected under one of the categories established by IUCN.

The work carried out so far has produced exceptional results, but we must not drop our guard: there is still a great deal to be done. We need to train more and better personnel who are going to face daily challenges in each of the parks; to improve their living conditions; and to provide them with the legal and management tools that will allow them to fulfil their mission.

Profile: ... and how do you see the future?

García: We have been able to protect a good sample of the most important areas of our natural heritage. However, the parks system has not been given the necessary budget to be able to fulfil the enormous commitment of conserving, for future generations, this irreplaceable heritage. To be able to say confidently that we are facing a promising future, it is necessary that all sectors of public life unconditionally assume their corresponding share of responsibility and that they support the programme that the Instituto Nacional de Parques has been quietly carrying out.

Without fear of contradiction, I believe that this feeling is shared on a global level, by a large number of colleagues who have been as concerned as I have, and who will continue to be concerned by what may occur with protected areas in the last decade of the Twentieth century.

Profile: After 40 years work, of facing challenges and celebrating achievements, what have been your most significant moments?

García: It is really difficult for me to highlight special dates. However, I must admit that personally I feel particularly satisfied with some of the orders

that have since been shown to be the "decision that cannot be postponed at a given moment." By 1936, three National Parks had been decreed in Venezuela, but it was only in 1958 when the *ad hoc* administrative structure was created in the Ministry of Agriculture and Breeding that allowed policies to be formulated and initiated the planning of the National Parks System that we know today.

For example, the declaration of the El Avila National Park, also in 1958, was an exceptional moment. It was a privilege to have had the opportunity as a *Caraqueño* (native of Caracas) of preserving the marvellous and imposing Cerro El Avila for its significance in historical and environmental terms and for the impression that has imprinted on the life of the *Caraqueños*, even on those who pay little attention to its magnificence and make limited use of the recreational potential that it offers them on one hand, and because it represented the culmination of conservation work initiated in 1936 on the other hand.

Similarly, the declaration of the Morrocoy National Park in 1974 was rewarding, not least because conviction and firmness was needed to carry out a clean-up process that allowed the recovery of a unique marine-coastal ecosystem for all Venezuelans, part of the natural heritage of the country that had been degraded by the illegal occupation of the zone.

Profile: What does the celebration in Caracas of the IV World Congress on National Parks and Protected Areas mean for you?

García: From the beginning of IUCN and particularly since the First National Parks Congress in 1962, the National Parks Service of Venezuela has been linked with the organization and has participated in the environmental policies drafted and carried out successfully at a global level.

Because of this I consider that the Congress, apart from allowing me to meet with old friends again, colleagues in conservation battles, represents an exceptional opportunity to show the international community what we have achieved and to strengthen the links of cooperation and support that will allow us to continue solving difficulties, I have no doubt that clear goals will be set for the benefit of all of us who inhabit this small and irreplaceable world.

CARACAS - 1992

Human Occupation in the National Parks of South America: a Fundamental Problem

Stephan and Thora Amend

Nearly 86% of the national parks of South America have to face the problem of human populations settled permanently or temporarily within their limits. Many countries have declared their parks as areas "for public use" in the spirit of the Washington Convention (1940), implying the right (and even the obligation) of the State to displace the inhabitants who are within a national park. However, in the majority of the cases, governments are not in a position to carry out such policies due to social, financial or personnel reasons. As a result, there are two alternatives for the future of the national parks in South America: to achieve the short-term relocation of the settlers for ecological reasons and with the consent of the affected persons, or initiate a continuous programme of environmental education and awareness, looking for alternative sources of income that will reduce the pressure on natural resources.

The category of "national park" has been undoubtedly the most successful of all protected area categories in South America. However, nearly 86% of the parks have to face the problem of human populations permanently or temporarily settled inside their boundaries. At present, many countries are looking to make the aspirations of these people compatible with the objectives of a national park.

To the question: "What are the three main problems in your national park?" the representatives of the oldest national parks in South America replied in the following way:

- Chile, Vincente Perez Rosales (decreed in 1926), Problem No.1: "Land tenure, existence of private estates (ranches) and settlers".
- Guyana, Kaieteur (decreed in 1929), Problem No.3: "Illegal activities such as occupation and mining".
- Argentina, Nahuel Huapi (decreed in 1934), Problem No.1: "Large area affected by grazing and private property".
- Brazil, Itatiaia (decreed in 1937), Problem No.1: "Unresolved land tenure".
- Venezuela, Henri Pittier (decreed in 1937), Problem No.2: "Invasions".
- Bolivia, Cerro Sajama (decreed in 1939), Problem No.1: "Total lack of implementation".
- Ecuador, Galápagos (decreed in 1959), Problem No.1: "Pressure from mammals introduced by settlers".
- Colombia, Cueva de Guácharos (decreed in 1960), Problem No.1: "Public order, drug dealers and guerrillas" Problem No.3: "Colonization".
- Paraguay, Tinfunque (decreed in 1966), Problem No.1: "The park has been established on private property affecting numerous ranches".
- Peru, Manu (decreed in 1973), Problem No.3: "Out of date policies regarding groups of natives".

Although many of the South American national parks have existed for several decades, conflicts between the local population caused by agricultural activities, illegal occupation and the use of the resources of the protected area continue as central issues (Figure 1).

Inhabitants of National Parks Project

The IUCN project "Inhabitants of the National Parks of South America" was initiated in mid-1990 with financial assistance from the German Technical Cooperation Agency (GTZ). The objective of the project is to determine what political and administrative concepts have been developed in different countries when faced with the problem of inhabitants in the parks and how it is going to be dealt with in the future. The project has been extremely well received. This is shown not only by the volume of replies to the questionnaires (73.4%), but also by the active participation of 41 outstanding professionals in the field of nature conservation in South America, who described the situation in their countries.

The study of the problem involved 184 national parks decreed in South America. The analyses were based on questionnaires, articles, conferences and other recent information materials which were distributed by the administrations of national parks or by non-governmental organizations in the countries concerned.

According to this information, only 26 South American national parks (14%) could be considered as totally uninhabited. This means that 158 national parks (86%) faced the problem of human occupation and use of their resources permanently or temporarily. The stark fact that 86% of the South American national parks are directly confronted with inhabitants does not necessarily mean that a serious situation exists. The proportion of park affected and the degree of environmental impact vary in each park with each population group (Figures 2 and 3). In general, both the affected area as well as the disturbance caused are very difficult to assess. In this respect only in a few parks have studies been carried out or reliable data have been gathered. Furthermore, only 29% of the South American national parks have management plans available that might offer information. However, it must be said that the large majority of the national parks of South America did fulfil the traditional demands made upon a national park, such as maintaining large virgin or at least uninhabited areas, and conserving a natural area under absolute protection.

Human Resettlement

The "Convention for the Protection of the Fauna, Flora and Scenic Natural Beauties of the American Countries" (Washington, 1940), which was signed

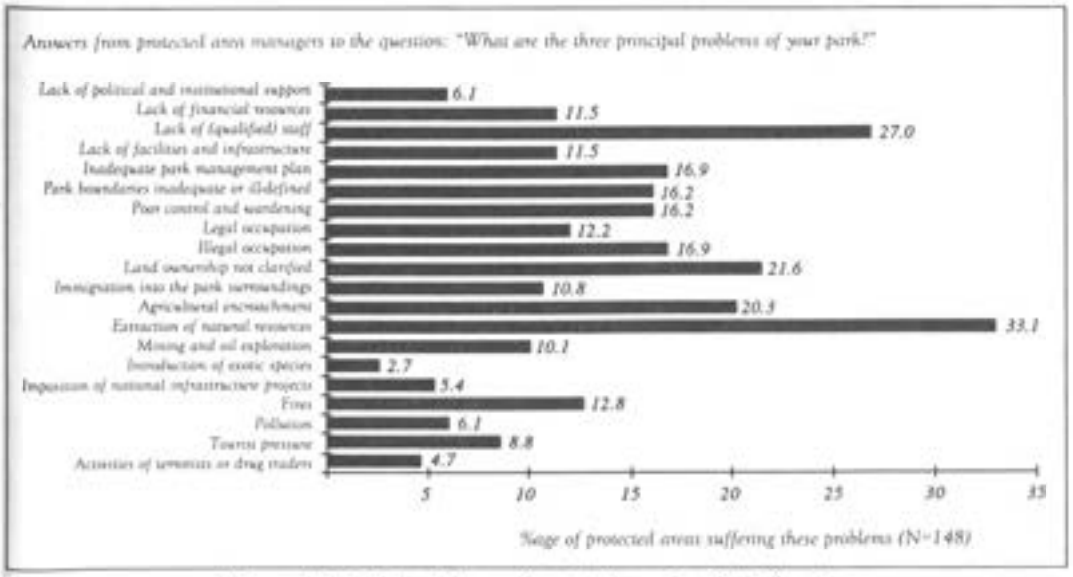

Figure 1: Principal problems of protected areas in South America

by all the South American countries with the exception of Guyana and French Guyana, has had a definite positive effect on national legislation. To accord with the spirit of the Convention, many countries declared their national parks as areas of "public use". From this the right (and even the obligation) of the State to evict inhabitants who live inside a national park originates, in much the same way as is done with large infrastructure projects such as the construction of dams or roads.

We know of only two cases in South America in which the State has actually exercised this right and eliminated all occupation: the national parks of Iguazú in Brazil and Guastopo in Venezuela. In both cases, hundreds of families were compensated and relocated. However, in the majority of cases the governments are not in a position to apply this measure because of social, financial or political reasons. Conflicts frequently arise between the affected population and the national park administration, as for example in the case of Amboró (Bolivia), Machalilla (Ecuador), Yurubí (Paraguay) or El Avila, Sierra Nevada and Mochima (Venezuela).

In principle a settler, who has lived in a region before the declaration of a national park, has the right to continue occupying his house and to farm his land until the corresponding expropriation and compensation comes into effect. This is his right, regardless of whether or not there is legal documentation regarding possession of the land. The law that declares a region as a national park cannot suspend the old right to possession and residence of the settler. However, regulations can be imposed on the settler that would oblige him to cultivate his land in a sustainable manner. But, when a settler deliberately invades an area already declared as a national park, without doubt this should be considered an illegal act. Therefore, the agencies for land planning and organization can use the category of "national park" as a legal basis for preventing new occupation and land use.

Native Peoples

South America is not only a fascinating and diverse continent from the landscape and biological point of view, but it possesses a high plurality of ethnic groups with their own cultures, languages and customs. These groups live in remote areas, almost unnoticed and unseen within their own

Lobster fishermen in the Archipélago de los Roques NP, Venezuela.
Photo: Amend.

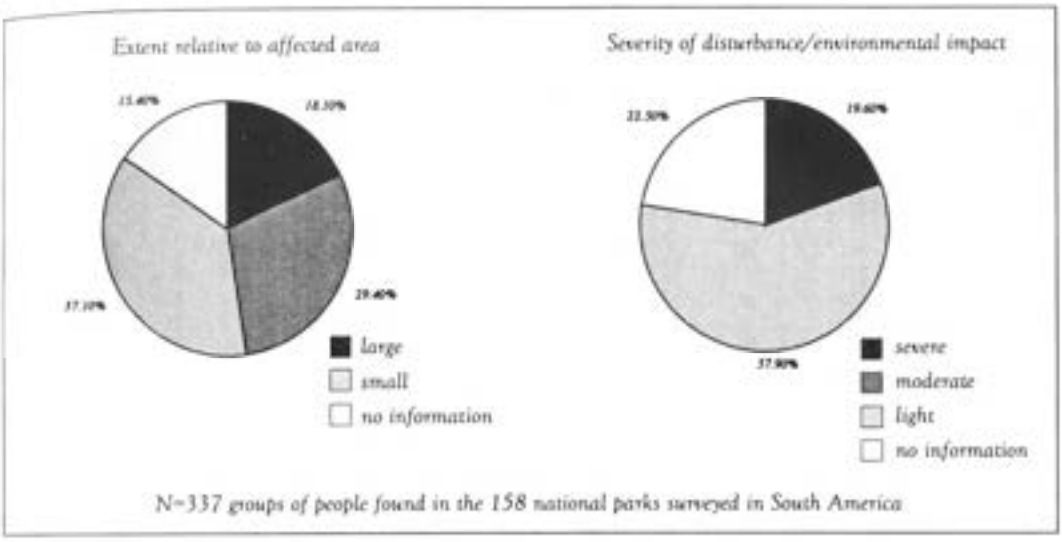

Figure 2: Extent and severity of disturbance to occupied areas in national parks in South America

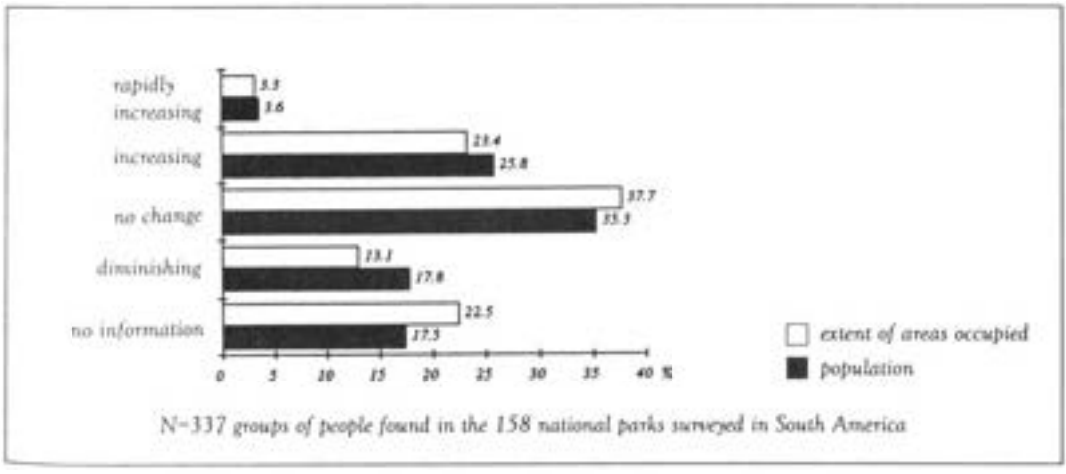

Figure 3: Population trends of settlers in national parks in South America

country. Because of this they are frequently jeopardized by not having legal documents for possession of their lands nor the necessary means to defend their ancestral territories from newcomers.

To protect these minorities, some governments have enacted laws to ensure their future survival. In Colombia, for example, the category *Resiguardo Indigena* (Indigenous Refuge) was established and this overlaps in 16 cases with one of the 33 Colombian national parks. Similarly, Argentina (Lanin) and Chile (Volcán Isluga, Lauca), the integration of the resident native population with the management of the national park is being sought.

While indigenous groups have had the support of conservationists at least since the 1960s, the situation is more difficult for other types of settlers in

national parks, although in many cases they have inhabited the region for several generations and have developed customs, traditions and very close links with their land. The majority of the national park administrators have not been prepared to face up to such management problems and therefore have only a vague idea of how to sustain these groups and their relationship with the protected areas. Some administrators have not even developed ideas in this respect, while others do not have the financial means nor the personnel nor the institutional support to carry out their policies.

The lack of consistency in technical and personnel issues, the frequent changes of direction in administration and the repeated failure of attempts at solutions have resulted in a loss of trust and credibility with local population. For example, in the management plan of Los Alerces (Argentina, 1986) the following despairing paragraph appears:

"Special recommendation: Given the innumerable occasions on which different officials from the National Parks Administration have, in general and in particular, spoken to the settlers generating expectations which have been nearly always frustrated up to now, the first and basic proposal on this issue is not to do it again until the decisions and the means to fulfil and to implement at least some of them, are available".

In consequence, there are two options for the future of national parks in South America:

1. Achieve the rapid relocation of settlers for ecological reasons with the consent of the people involved, or
2. Integrate the local populations within the management concept of the park and initiate and continue the task of education and increasing environmental awareness, while at the same time looking for sources of income that would reduce the pressure on the natural resources.

Conclusions

There are serious and original efforts in nearly all the countries in South America to address problems of human populations living in national parks. However, in the majority of cases they are due to the individual initiatives of a few concerned personalities and groups and the results are meagre compared with the vast task. To combat the difficulties and to improve the situation, the job of a national park official must be up-graded professionally and be better paid. The future of the parks depends to a large extent on the promotion of personnel who are willing to work together with the local populations for the protection of nature and the conservation of beautiful landscapes for future generations.

Acknowledgements

The authors wish to express their gratitude to the numerous persons in South America who collaborated impartially and enthusiastically in the IUCN-GTZ project "The Inhabitants of the National Parks of South America" (the results of the project are currently in press), as well as Jeffrey McNeely of IUCN and Prof. Dr Ludwig Ellenberg of GTZ for their personal and institutional support.

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TRAINING

Rancho Grande Training Centre, Henri Pittier National Park, Venezuela

The Servicio Nacional de Parques (National Parks Service) of Venezuela has been, since 1974, studying the possibility of establishing a Training Centre for the personnel who manage and operate national parks and other natural protected areas. However, for various reasons this project has not been developed despite cooperative efforts carried out by different national and international organisms, such as FUDENA, US National Park Service, US Fish and Wildlife Service, World Wildlife Fund US and the Organization of American States (OAS).

It was only in 1990, that the Dirección General de Parques Nacionales of the Instituto Nacional de Parques initiated the implementation of this desirable and necessary project with the restoration of 9,500 m^2 of the old building of Rancho Grande which is the Headquarters of the Scientific Station of the Henri Pittier National Park.

This national park, the first one to be established in the country (1937), has an area of 107,800 ha. It has an abrupt and irregular relief which ranges from the base of coral reefs to 2,430 m altitude and supports a wide diversity of plant formations from halophytic communities and mangroves, through xerophyte forests, caducipholious or tropophyllous forests, savanna vegetation and cloud forests. The biodiversity is correspondingly high, for example over 520 bird species have been recorded.

The decision to establish the training centre in the national park is based on the existence of an infrastructure, situated in an area whose environment possesses a wide biological diversity

"Rancho Grande" Training Centre
Photo: Mario Gabaldón

and a variety of ecological systems that make it very interesting as a study and research area, and ideal for developing practical skills. In addition, there is good road access and it is close to Maracay (the capital of the State of Aragua), an important urban centre only 60 minutes away from Caracas.

The building designated for the training centre was built between 1933 and 1935. It was the country's first biological station and hosted researchers of the calibre of Henri Pittier, Liberty Bailey, William Beebe, Francisco Tamayo, Paul Schwartz, Julian Steyermark, Ludwig Schnee, David Fairchild, Ernest Schaeffer, Alfredo Jahn, Alberto and Francisco Fernández Yepez, and Gonzalo Medina. They made many important discoveries in the marvellous natural world of this national park.

To guarantee the proper management of Venezuela's national parks, it is necessary that the personnel who work in them have interdisciplinary knowledge as varied as: land use planning, biological sciences, environmental management, geomorphology, archaeology, sociology, economy, legislation, environmental education, interpretation of nature, recreation, architecture and landscape design.

Therefore, the general aim of the training centre is essentially to create, through a system of continuous career development, a highly trained body of personnel who can administer and manage the national parks and other natural protected areas at the appropriate level. To achieve this objective a permanent programme has been designed to fulfil the following in the short and medium term:

- to train technical personnel and other staff who work in the national park system in applied and practical planning, administration and management;
- to train university students reading environmental sciences, to encourage them to carry out graduate and post-graduate research in national parks;
- to train and develop conservation understanding in the rangers who guard the natural protected areas of the country.

The academic content of the courses for the medium and upper levels is based on integrated concepts of ecological management of wild areas, planning principles, administration and development. The courses aim to standardise criteria, terminology and working methods, while at the same time exchange practical experience.

Once the restoration of Rancho Grande is complete, we have the firm intention of starting this training programme formally over a period of two years, in cooperation with the personnel of the natural protected areas system, not only in Venezuela but of any country in Latin America and the Caribbean who would like to participate.

For this we count on the support of Wildlife Conservation International (WCI) and the Education Association for the Conservation of Nature (Asociación Educativa para la Conservación de la Naturaleza - ECONATURA). The Instituto Nacional de Parques of Venezuela (INPARQUES) has concluded an agreement with these non-government organizations to provide during the next two years four management courses for professionals, technicians and area administrators, four basic courses for park rangers, two advanced courses for park rangers, two courses for university level students and ten workshops for employees of the environmental guard. This programme is also financially supported by the European Community.

For additional information contact: Dirección General de Parques Nacionales: Apartado Postal No. 76471, Caracas 1071-A, Venezuela. Telex: 24362 INAP VC, Fax: 58-228-5 3070.

Mario F Gabaldón is Director General of the National Parks of Venezuela.

The Evaluation of Natural Protected Area Systems: a Numeric Method

Carlos Rivero Blanco and Mario Gabaldón

One of the problems that managers of natural protected areas face is the difficulty of identifying the degree of intervention for these areas and establishing priorities for the application of corrective action to solve critical problems or to guarantee effective protection. The National Parks Service of Venezuela has developed a method with the objective of establishing management priorities and focusing it on those parks rated as the most important.

The headquarters of the National Parks Section (DGSPN) of the National Institute of Parks of Venezuela is responsible for maintaining a system of 56 management units, consisting of 39 National Parks and 17 National Monuments which are in various degrees of utilisation according to their characteristics and demand for use. To adequately and efficiently manage a system of this size, it is necessary to know the status of each unit and whether their integrity or stability are in jeopardy; attention can thus be directed towards priority areas.

A Methodology

To establish the intrinsic sensitivity of the natural areas and then to be able to identify units requiring prompt attention, DGSPN has been developing, refining and implementing a methodology which consists of the following steps:

- define and assess criteria that allow the sensitivity to use of each management unit to be measured as a "sensitivity index";
- carry out an evaluation, based on these criteria, to establish by common consensus the relative sensitivity of each management unit;
- evaluate each management unit, regarding its sensitivity index as a "specific weight" (see below), by subjecting it to the pressure of permitted and non-permitted uses and to other forms of influence, to detect in this way those units in a dangerous or critical state.

Sensitivity Criteria

Technical personnel participating in the evaluation procedure established and assessed the criteria described below.

Dimension. The area of the unit – a large park is less vulnerable or sensitive than a small park.

Maturity of natural communities. The abundance of mature communities is a good way to express and measure the state of a protected area in contrast to other sites where communities are predominantly secondary. Those communities still supporting top carnivores are usually mature and stable.

Isolation. The geographic isolation of the management unit is relevant – the more isolated an area is from human activities, the greater its protection.

Diversity of landscape. A varied landscape is an important attribute of natural areas, not only for the choices offered to the visitor, but also as an indicator for the conservation of high diversity.

Number of extinct species. The absence of certain species could be a manifestation of the decline of the natural conditions and reveal the degree of existing intervention. This criterion demands detailed information in order to be used effectively.

Degree of intervention. The current state of human intervention is of vital importance and from this it is possible to infer how long natural regeneration will take.

Capacity for recovery. There are great differences in the regenerative capacity of soil and vegetation

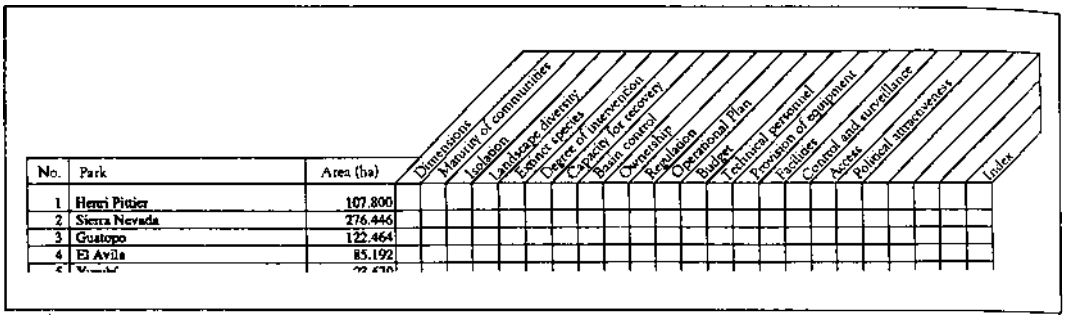

Figure 1: Matrix for the determination of the sensitivity of protected area management units.

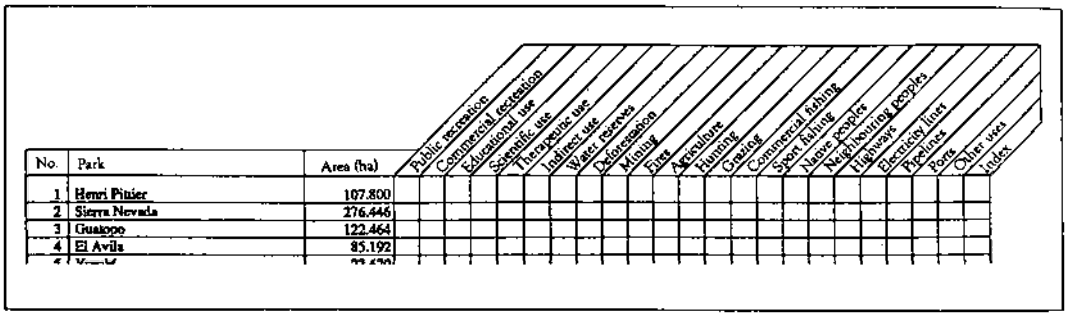

Figure 2: Matrix to compare management units with uses and other impacts

cover. Where soils are less likely to be eroded and more fertile, parks will have a greater capacity for recovery than those in places susceptible to erosion and low soil fertility.

Control of the basins. Those units where it has been possible to include the head-waters of their drainage basins are less sensitive than those units that have no such control.

Ownership. When an area belongs to the nation it is less vulnerable than when there are private properties within its boundaries.

Regulation. Parks which enjoy some degree of legal regulation are less sensitive than those lacking such protective mechanisms.

Operational Plan. Parks which possess operational plans are in an advanced state of management, which is characteristic of greater stability.

Budget. A budget which would allow the plan to be carried out and reach its objectives confers stability on the management unit.

Technical personnel. The number and quality of the local technical personnel is an important factor in the maintenance of protected areas.

Provision of equipment. Equipment is essential to provide support for the management of parks and monuments.

Facilities. The provision of facilities and infrastructure is a vital part of the proper functioning of protected areas.

Control and surveillance. The existence of a surveillance corps and the practice of control over the area and its boundaries is essential, especially in those parks close to human settlements.

Access. Access may be more or less controllable depending on how open the boundaries of the area are.

Political attractiveness. Some natural areas are politically attractive if they have some development potential that could be a source of income and abundant and easy revenue, even if the development is unsuitable or detrimental. The areas under most pressure are those parks with beaches. Other areas such as plains or forests are almost ignored by such interested parties.

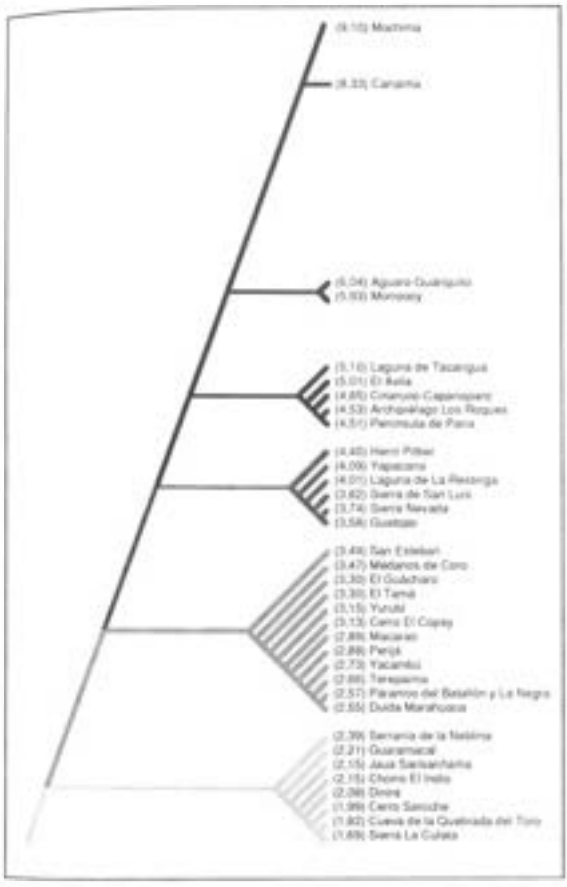

Figure 3: Dendrogram showing the position of each management unit in the system after the assessment of 35 parks carried out by the technical staff. Numbers in parenthesis indicate the degree of sensitivity of each management unit. Higher values indicate a greater degree of sensitivity.

The consideration of the criteria and the evaluation of the management units are carried out by common consensus among a group of experts, by scoring on small scales from 0 to 5 or 10. The method is very flexible and allows, with certain adjustments, the arrangement of the areas to give a complete picture and prioritise management actions.

Results

Once the intrinsic sensitivity is determined using the Sensitivity Matrix (Figure 1), the resulting numerical value constitutes the "specific weight" of each management unit. Then a comparison with a variety of uses and disturbance factors which influence the unit is carried out using the Contrast Matrix (Figure 2). Uses (permitted or not) and disturbance factors which are used as evaluation criteria in the Contrast Matrix include: public recreation, commercial recreation, educational use, scientific use, therapeutic use, indirect use, water reserves, deforestation, mining, burning, agriculture, hunting, grazing, commercial fishing, sport fishing, the presence of native peoples, neighbouring peoples, roads, electricity supply lines, and ports.

This matrix allows the areas to be evaluated through discussions by the group of experts, considering their sensitivity to the uses and factors which do or might act upon them. The result is a numerical arrangement of the units, from the most affected or in danger to the least affected and with least problems (Figure 3).

Using this method it has been possible to identify two parks in a critical state (Mochima and Canaima), two in a dangerous state (Aguaro Guariquito and Morrocoy), and two (Laguna de Tacarigua and El Avila) with quite a high score. The other parks did not appear to be markedly threatened and suffered less complex problems.

Conclusion

The information generated by this method allows problems to be solved according to their order of importance and makes management more efficient. As the method allows and indeed demands interaction by many people and is based on common consensus, the outcome is always better understood and accepted by the group.

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Joint Efforts for the Conservation of Cuare Wildlife Refuge, Venezuela

Cecilia de Blohm

The socio-economic development of people is intimately linked to the conservation of the natural resources on which we depend for our survival. One of the challenges of the 1990s will be to reconcile the relationship between conservation and development in a dynamic process that is increasingly complex and requires the assistance of all sectors of society. The experience accumulated in the preparation of a management plan for the Wildlife Refuge of Cuare provides an example of such cooperation, resulting from a joint effort between a non-governmental organization (FUDENA) and a government agency, the National Autonomous Service for the Protection, Restoration, Promotion and Rational Use of Wild and Aquatic Fauna (linked to the Ministry of the Environment and Natural Renewable Resources).

Natural Resource Conservation is a complex issue which is not limited to protected areas, but is dependent on various elements inside and outside them. To protect them effectively, such areas can no longer remain isolated but have to be incorporated into the fabric of society. Joint efforts between non-government and government organizations resulted in the Management Plan for the Wildlife Refuge of Cuare, an important element for regional socio-economic development.

The socio-economic development of the people is intimately linked to the conservation of the natural resources on which we depend for our survival. One of the challenges of the 1990s is to be able to reconcile the relationship between conservation and development in a dynamic process which is increasingly complex and requires the assistance of all sectors of society.

Golfete de Cuare.
Photo: FUDENA.

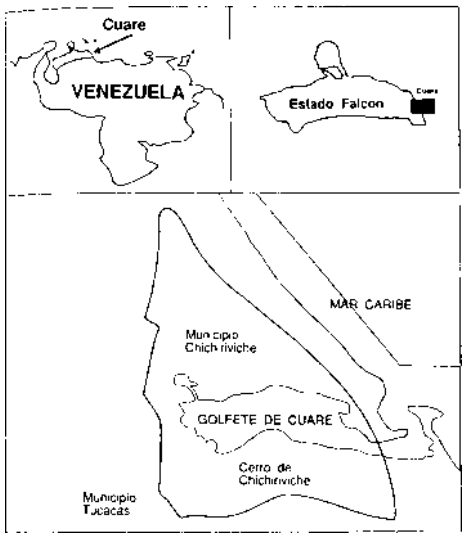

Figure 1: National and Regional Location, and boundaries of Cuare Wildlife Refuge

The application of conservation, in the broadest sense, to national parks and protected areas is not limited only to these areas but is intimately linked to other elements that involve the zones of influence and the populated towns which are inside and outside them, and which depend on the protected areas for their survival. Therefore, planning, organization, protection, administration and management of National Parks and Protected Areas is complex and not only involves the planner, but requires the collaboration of other official or private bodies, non-government organizations and especially the local communities, who are the main beneficiaries.

Lessons from Cuare

Traditionally, natural protected areas were perceived as isolated from the environment, today it is essential to incorporate them into the fabric of society. A change in attitude is becoming imperative, both on the part of those responsible for management as well as from other sectors of society.

For example, the experience accumulated in the preparation of a management plan for the Wildlife Refuge of Cuare is the result of a joint effort between a non-governmental organization (FUDENA) and the National Agency for the Protection, Restoration, Promotion and Rational Use of Wild and Aquatic Fauna (Servicio Autónomo para la Protección, Restauración, Fomento y Racional Aprovechamiento de la Fauna Silvestre y Acuática del País - Profauna) of the Ministry of the Environment and Natural Renewable Resources (Ministerio del Ambiente y de los Recursos Naturales Renovables - MARNR).

Broadly speaking, the Cuare Wildlife Refuge (which was established in 1972) is the first of its type in Venezuela. It is located in the west-central coastal region, in the State of Falcón, and it has an area of approximately 12,000 ha. Its objectives are directed to the conservation of the species of fauna, especially those threatened or endangered, with an emphasis on the Flamingo *Phoenicopterus ruber ruber* and the American Caiman *Crocodylus acutus*. The area consists of a continental zone of flood plains, dry tropical forest, mangrove communities, and coastal lagoons. Cave formations and the existence of pre-Colombian petroglyphs add an important anthropological value. The marine zone, represented by the Golfete de Cuare, harbours fish and mollusc species of commercial importance; an island chain, consisting of five keys, serves as protection for four species of marine turtle and as a roosting place for a rich avifauna, both local and migratory.

This varied group of ecosystems comprises an area of great scenic beauty, an attraction for recreational activities, education and tourism. It also contains the first locality chosen for designation under the Ramsar Convention when the Venezuelan Government became a signatory.

Profauna-MARNR and FUDENA brought together an interdisciplinary group to prepare the management plan for the Refuge, in which the following topics were identified: six management programmes, research priorities, conflicting

activities in need of solutions, and the bodies that should participate in the solution of these problems. In this way, the management plan became a tool that accelerated the preparation of the proposals and fund-raised for the establishment of field programmes.

Although the management plan, a product of work by a group of biologists, is an excellent reference point for action, its implementation requires the integration of experts in other disciplines such as engineers, economists and sociologists: in Cuare and its environs, conservation problems are basically of a social, political and economic nature.

Illegal Land Occupation

Among the problems mentioned above, one of the most pressing is the illegal occupation of land, with its associated structures and unplanned human activities. Such occupation results in considerable disturbance of ecological processes and threats to the integrity of the Refuge.

The legal sanitation, re-location and regulation of these human settlements are vital as, apart from being inside the boundaries of the Refuge, they are located in marshy and unhealthy areas which are unsuitable for permanent housing. Accordingly, the MARNR decided to decree a General Judgement of Expropriation (Juicio de Expropiación Universal) to control the situation of the immigrants. However, the government does not have sufficient financial resources at present for the eviction of the occupiers from the Refuge and the local government, represented by the Municipality, alleges that it does not have land for re-location.

Other urgent issues to solve are environmental pollution resulting from the water used by the populations situated within the Refuge, its area of influence and the final disposal of solid wastes within the limits of the protected area. These matters are of concern to the local authorities but they do not have the necessary resources to deal with them. Joint efforts are required from the official Venezuelan organizations involved, so that economic collaboration from bilateral and international cooperation agencies can be obtained.

Impact of Tourism

The difficulties mentioned above cannot be solved in isolation, especially if the present pressures on

Greater Flamingoes Phoenicopterus ruber *are an important feature of the Cuare Wildlife Refuge.*
Photo: FUDENA.

Refuse dump inside the Cuare Wildlife Refuge. Photo: FUDENA.

the area caused by its immense tourist and recreational potential is taken into account. The tourist policies in the country have created incentives for the investment of national and international capital, especially in the coastal zone, which has given rise to a series of large scale hotel developments. These have caused considerable alteration to the land for themselves and for the construction of associated services.

Tourism benefits regional socio-economic development and is desirable, as long as the living conditions of established communities have been improved beforehand. These developments must also take into account their alterations to the environment and must prevent or minimize the resulting damage. Such damage is often irreversible and destroys important ecological processes, scenic features, or the natural attractiveness that provided the original tourist value.

Conclusion

The management plan for Cuare Wildlife Refuge is clearly an important element for regional socio-economic development. However, there are other aspects that should be considered in order to achieve an equilibrium between development and conservation, which requires planning for the area itself as well as for its zone of influence. The economic, social, ecological, ethical, technical and political factors that must be taken into account in the planning process are closely related and in order to achieve a balance between development and conservation, decisions have to be taken carefully and patiently.

Cuare Wildlife Refuge is a highly productive area from the biological point of view. It is also a generator of goods and services for the community and thus it is an instrument for the long-term regional development. It is in danger if the right decisions are not taken to solve the most urgent problems.

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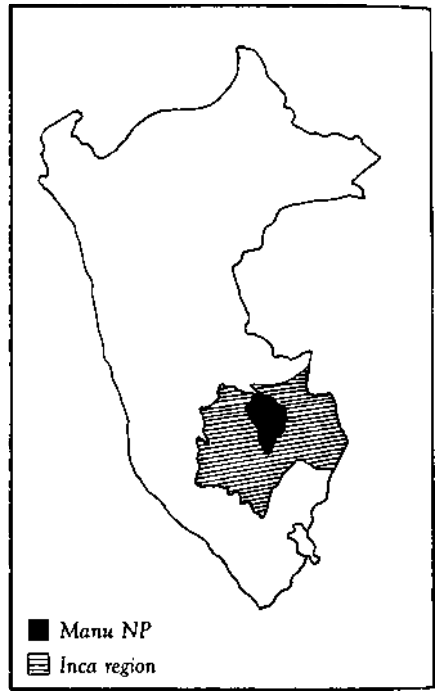
FLAGSHIPS

The story behind the emblem

MANU NATIONAL PARK, PERU

Manu National Park, which covers over 1.5 million ha, was established by the Peruvian Government on 29 May, 1973, through Supreme Decree No. 0644-73-AG. It is perhaps the only national park in Latin America that encompasses an ecological gradient which goes from the puna and the high Andes to the lower forest. The National Park harbours a fauna worthy of record, including 860 bird species (approximately 10% of the world's species); in an area of about 450 ha surrounding Cocha Cashu alone, 560 birds have been recorded. This confers on it a special character within the protected areas system of Peru, namely that of protecting a complete basin as 'control site' against which the degradation which is taking place in the Amazon can be measured.



This invaluable function is enhanced by the work of the Cocha Cashu (or Laguna Cashu) Biological Station situated on one of the meandering lagoons of Manu River which provides a natural environment where no hunting of any kind takes place and where the true ecology of the Amazon remains unaltered. Here, long-term scientific studies are carried out to further the understanding of the natural processes in the eastern slopes of the Andes - studies which have not been possible in other sites due to human pressure. Currently, an applied research programme is being set up to study the productivity of animals and plants of economic importance.

The National Park also contains a Biosphere Reserve complex which can be used for these programmes including Manu Reserved Zone where more applied studies with a certain degree of manipulation of populations can be carried out. Finally, the National Park contains the neighbouring population of the Cultural Zone as future rational users, with technologies created in the Park itself.

Manu harbours many vulnerable, rare or endangered species, whose presence signifies the maintenance of the ecological health of the National Park. These indicator species include the otter (or river wolf), the jaguar, the black lizard and the harpy eagle: it was decided to adopt the latter as the emblem for Manu National Park.

Felipe Injoque

Progress in the Management of Buffer Zones in the American Tropics: Proposals to Increase the Influence of Protected Areas

Alejandro C Imbach and Juan Carlos Godoy

The role of protected areas in the tropical region is closely linked to their function for conserving biodiversity, which underlies the maintenance of essential ecological processes and contributes to the sustainable development of the region concerned. The administration of protected areas in the American tropics is impeded by a number of external threats such as: insurrection, oil exploitation, road or dam construction, timber extraction and expansion of agricultural land, as well as the problems of internal management. Experience with the productive management of tropical lands has shown that the production systems designed for temperate and cold areas are not suitable for the tropics.

The basic attitude of conservationists towards protected areas has been defensive. Our intuitive reaction, as stunned witnesses of the devastation of natural areas and decline of wild populations, has been to protect and save everything that is possible before the situation is beyond repair. This is undoubtedly the correct attitude, but one which cannot by itself guarantee a sustainable future for the planet. The time has come when we have to take a more modern conservationist approach to managing the vicinity of protected areas, as well as degraded areas, in order to contribute to their recovery.

It is because of this that buffer zones, or any region influenced by protected areas, become particularly relevant. These areas have been traditionally defined as a catchment or barrier protecting the resources of the protected area, thus preventing the advance of human populations or of any business interests that might threaten them. A change of attitude is proposed: buffer zones should be considered as centres for sustainable development based on the maintenance of essential ecological processes and biological diversity. They should be viewed as valuable places where it is possible to extend species and ecosystem conservation, in a way that is compatible with the development of the local communities.

The New Buffer Zone Concept

Protected areas are regional reservoirs of wild populations of native animal and plant species, whose economic and ecological potential must be incorporated into the surrounding production systems. The new concept retains the objectives of minimizing the impact on protected areas and of optimizing the effect of these areas on neighbouring communities and their development. Buffer zones must not be established as centres of development or attraction but remain as simple schemes of rural development.

To achieve this, the global model of land occupation comprising an extensive carpet of a few crops, with protected areas as islands for the conservation of biological diversity and ecosystems, must be replaced by alternative models supported by ecological criteria that engender different types of "mosaics". These mosaics should be based on the utilization of a wide range of species and rotated in

Rocio Jiminez

various ways through time. Moreover, the boundaries of the protected areas would merge with the sustainable activities carried out in the buffer zones.

However, the present use of non-protected land is still far removed from the above model. In temperate zones it follows a pattern that is based on structural simplification and intensification of the energetic cost of production. This results in a large reduction of the biological diversity in farmed areas, as well as serious disturbances to the basic functioning of ecosystems, leading to a decrease in the potential for sustainable development. The greatest challenge in the near future will be how to reverse this process and one of the questions to answer is what role protected areas can play as true instruments for development.

The success of this approach lies in the incorporation of the existing biological resources in protected areas with the production systems of neighbouring communities and in this way ensuring that the communities understand the reason for conserving them and commit themselves to their defence.

Future Administration of Buffer Zones

To attain the proposed objectives it is necessary to review some operational aspects of buffer zones, including their legal status (it is desirable to have a legal basis that facilitates the work within them, although the legal power to make people modify their consumption or production patterns will often not be available).

Buffer zones projects should adopt schemes similar to those used in agricultural or forestry programmes. In these, technical personnel work with the producers to demonstrate and convince them of the importance of the relationship between their own activities of production and the protection of strategic elements. This includes the need to modify the system of production as a function of balanced environmental conservation.

The buffer zone must not be defined as a rigid territory extending from the boundaries of protected areas. In this respect, administrators of protected areas must try to change attitudes in relation to the traditional land use in the neighbouring region. This implies that those institutions which have administered natural spaces under protection alone must leave the limits of the protected area to work in conjunction with other development institutions; to do this, it will be necessary to modify some administrative structures.

The concept which has to be put into practice is that of utilizing buffer zones as experimental and development sites for new production systems. These should be structured around non-traditional processes based on the diversity of species and products. Clearly, the active participation of local communities is indispensable both for the identification of the resources to be used as well as for the later stages of research and incorporation of new technologies.

Case Histories

There are examples of this new approach that have been developed in different parts of the American tropics. Although they are not complete and do not pretend to be models of development, they do serve as useful demonstrations of what can be achieved in practical terms.

Lower Talamanca

This is a region on the Atlantic coast of Costa Rica that is influenced by the various protected areas associated with La Amistad Biosphere Reserve. The Centre for Tropical Agronomic Research and Education (Centro Agronómico Tropical de Investigación y Enseñanza - CATIE) and IUCN formulated an ethnobotanical project to identify plants traditionally used in the local community. Eight species were selected for incorporation into the community's productive system. Detailed agronomic studies were carried out, working with the community during the phase of identifying and determining priorities, as well as in the research stage. Accordingly, it is anticipated that the producers will conserve the forests as sites for the production of species, defend protected areas as sources of germplasm, and develop a more stable and profitable production system that can also help them raise their standard of living.

Bocas del Toro

In Panama, across the border which La Amistad straddles, CATIE, IUCN and the National Institute of Natural Resources are working in the Province of Bocas del Toro with communities of the indigenous Guyami people. In this case, alternatives for sustainable forest utilisation are being sought.

Rocio Jiminez

Petén

In the central region of Petén, Guatemala, in an area where the agricultural frontier is advancing toward the heart of the recently formed Maya Biosphere Reserve, CATIE and IUCN have initiated pilot projects to mitigate the pressures brought by migration to the protected area and to find methods for the rational use of non-timber products. Having concluded ecological and socioeconomic studies, measures to improve agroforestry systems with traditional species are being promoted. Simultaneously, an environmental education programme has been developed to create awareness among the population, particularly about the potential benefits that can flow from conservation policies.

Ecuador

The National Parks Service (Dirección de Parques Nacionales) and IUCN have carried out an analysis of Amazonian protected areas and have recently proposed a project to promote the management of those areas influenced by them according to the guidelines described above. In this case, there are no legal provisions for the designation of buffer zones, so the project focuses on extension and education with the participation of other national institutions competent in the fields of production and land tenure. In particular, the project envisages a training and coaching programme directed at local field personnel, so that they become the promoters of the programme in the communities that live inside and outside the protected areas.

Conclusion

The complexity and difficulty of the factors affecting protected areas and their environs are evident. Yet, unless they are met with determination it is difficult to see how we can aspire to more than protected islands with a limited capacity for regeneration and permanency. In the long run, we would have to be resigned to the loss of most of our existing protected areas with all that this implies.

The likelihood of a sustainable future for all of us depends to a large extent on the success that we achieve in the buffer zones.

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The illustrations in this article and elsewhere are from the forthcoming IUCN Tropical Forest Programme publication, Rainforest Buffer Zones: Guidelines for Protected Area Managers *by Jeffrey Sayer. Details available from the IUCN Publications Unit, 181a Huntingdon Road, Cambridge CB3 0DH, UK.*

Expanding the System of Conservation Areas in the Brazilian Amazon

Maria Teresa Jorge Padua

There are several documents and recommendations proposing that the extent of protected areas in the countries of the Amazon Basin should be increased. Few, if any, have quantified what this means in financial terms for these developing countries. A recent study carried out in Brazil by FUNATURA, SCT and UNDP entitled the Cost of Implementing Conservation Areas in Legal Amazonia establishes the cost of extending and establishing a system of direct and indirect use of the natural resources that would account for 30% of the region.

Brazil has today, under the heading of Federal Conservation Units (FCU), the following:

34 national parks
23 biological reserves
21 ecological stations
38 national forests
12 environmental protection areas
4 extraction reserves

These have a total area of 312,950 km², that is 3.7% of land surface of Brazil, of which 1.8% corresponds to FCUs with indirect use and 1.9% to FCUs with direct use of the natural resources (see Table 1).

The most privileged biome of all the conservation units, in relative terms, is the Amazon, 3.5% of which comprises indirectly used protected areas and 4.1% of which is designated as directly used areas, making a total of 7.6% of Amazonia.

Proposal for Extension

Legal Amazonia encompasses 5,035,372 km² and comprises the largest patch of tropical forest on the planet, close to 28% of the surviving tropical forest in the world. A general objective of the study "Cost of Implementing Conservation Units in Legal Amazonia" was to estimate the financial resources needed for the creation of FCUs across 30% of the territory, which is equivalent to 1,510,610 km² of further designated protected areas.

The specific objectives were:

- To estimate the cost of selection, delimitation, management planning, implementation (demarcating, infrastructures and equipment) and maintenance (human resources and consumable materials) of the conservation units in legal Amazonia.
- To estimate the costs of acquisition based on the *Valor de Terra Nua* (VTN) – the price of virgin land.
- To find the proportion of land to be acquired in the region in general terms, to reflect the FCUs already in existence.
- To estimate the final cost of implementing and maintaining the existing conservation units as well as the new units, with the intention of reaching the goal of 30% of legal Amazonia.

An average area of 500,000 ha was taken as the unit of minimum area, a higher figure than the 300,000 ha proposed by Terborgh (1975) and the following stages were defined for the establishment of the system:

- Selection and definition of boundaries
- Demarcation
- Management plans
  - Equipment
  - Human resources
  - Materials
  - Land Purchase

		Amazonia	Atlantic Forest	Closed Areas	Caatinga	Pantanal	Southern Platanal	Marine Areas	TOTAL
National Park	No.	7	7	11	1	1	4	3	34
	Ha	7,572,000	213,700	1,163,784	98,000	135,000	263,500	257,600	9,703,584
	%	2.10	0.33	0.58	0.10	0.68	0.66	0.64	1.14
Biological Reserve	No.	8	12	-	1	-	-	2	23
	Ha	2,941,000	87,272	-	1,100	-	-	53,000	3,082,372
	%	0.82	0.13	-	0.00	-	-	0.13	0.36
Ecological Station	No.	9	5	2	1	1	3	-	21
	Ha	2,141,060	18,931	163,700	1,116	14,000	45,300	-	2,384,107
	%	0.59	0.03	0.08	0.00	0.07	0.11	-	0.28
National Forest	No.	24	4	1	-	-	9	-	38
	Ha	12,479,294	8,006	38,000	-	-	72,100	-	12,597,400
	%	3.47	0.01	0.02	-	-	0.18	-	1.48
Environmental Protection Area	No.	1	6	4	-	-	1	-	12
	Ha	21,600	963,789	327,200	-	-	33,800	-	1,364,459
	%	0.01	1.48	0.16	-	-	0.08	-	0.16
Extraction Reserve	No.	4	-	-	-	-	-	-	4
	Ha	2,162,989	-	-	-	-	-	-	2,162,989
	%	0.60	-	-	-	-	-	-	0.25
Conservation Unit of Indirect Use	No.	24	24	13	3	2	7	5	78
	Ha	12,654,060	319,903	1,327,484	100,216	149,000	308,800	310,600	15,170,063
	%	3.51	0.49	0.66	0.10	0.74	0.77	0.78	1.78
Conservation Unit of Direct Use	No.	29	10	5	-	-	10	-	54
	Ha	14,663,883	971,795	365,200	-	-	105,900	-	16,124,848
	%	4.08	1.49	0.18	-	-	0.26	-	1.89
TOTAL	No.	53	34	18	3	2	17	5	132
	Ha	27,317,943	1,291,698	1,692,684	100,216	149,000	414,700	310,600	31,294,911

Table 1: System of Conservation Units in the Brazilian Amazon.
Source: Jorge Padua and Coutinho, 1991.

Out of the total area to be established (1,510,610 km²), 30% would be assigned to units of indirect use and 70% to units of direct resource use. It should be noted that units of direct use can bring economic benefits that could be used to finance the system. It is also proposed that half of the units be under federal administration and the other half under state administration. Given these conditions, the proposed areas of the various conservation units envisages under Brazilian law are set out in Table 2.

The distribution of the conservation units in the States that form legal Amazonia cannot be uniform due to the differing availability of land in each region for each management category. Thus, in the States of Tacantins, Mato Grosso and Maranhao there are no large potential zones for the creation of Extraction reserves. Similarly, it is not possible to establish any national forests in Tocantins State. In contrast, the State of Rondonia has already created conservation units in nearly 30 per cent of its territory.

According to the study, 241 new conservation units would be established:

34 national parks
12 biological reserves
15 ecological stations
94 national forests
14 environmental protection areas
72 extraction reserves

of which 42 would have areas less than 500,000 ha and 38 would have larger areas.

The 161 remaining units would have areas in the order of 500,000 ha. The number of units per category for each state is calculated by dividing the total area of the category by 500,000. For example, in the Para State, two national parks would be established (1,347,196/500,000 = 2.7), one of 500,000 ha and the other of 847,196 ha, and four state parks (2,341,196/500,000 = 4.7, three of 500,000 ha and one of 841,196 ha.

Conservation units		hectares
of indirect use		46,000,000
Parks		28,000,000
National	14,000,000	
State	14,000,000	
Biological reserves		9,000,000
Federal	4,500,000	
State	4,500,000	
Ecological stations		9,000,000
Federal	4,500,000	
State	4,500,000	
Conservation units		
of direct use		105,061,160
Forests		62,300.00
Federal	31,150,000	
State	31,150,000	
Extraction reserves		39,700,000
Federal	18,850,000	
State	18,850,000	
Environmental protection areas		3,061,160
Federal	1,530,580	
State	1,530,580	
Total		**151,061,160**

Table 2: Proposed areas of various types of conservation units.

Cost of the Proposed Extension of Conservation Areas

To calculate the costs, units with an area of over 500,000 ha are assumed to have the same costs as those estimated for 500,000 ha units with the exception of the cost of acquiring and demarcating the land. When the corresponding costs of the existing conservation units are added to the cost of the creation of new areas, the figures given in Table 3 are obtained.

The total cost of establishing conservation units to reach the goal of protecting 30% of legal Amazonia is US$12.3 thousand million, and the cost of annual maintenance is US$99.3 million for the first year and US$94.5 million for subsequent years. However, the State of Mato Grosso alone accounts for 61.7% of the total as it has no public lands available and the cost of the land is extremely high. Another important point is that 96.4% of the total cost of establishment is due to the acquisition of the land.

	Establishment (US$)	Maintenance (US$)	
		first year	following years
Existing conservation units	760,163,000	29,145,000	26,749,000
New conservation units	11,522,810,550	70,150,000	67,731,000
Total	**12,782,973,550**	**99,295,000**	**94,480,000**

Table 3: Relative costs of conservation units.

Conclusions

The study reported here indicates that the total cost of establishing and explaining a system of conservation units of direct or indirect use of the natural resources in the Brazilian Amazon is extremely high and out of the reach of a country suffering an enormous economic crisis. Indeed, it would be difficult for any country in the world to carry out a plan that requires US$12 thousand million, even those who have abundant financial resources. Nevertheless, this is the reality with which we must work, and evidently there are certain strategies that could be adopted, for example:

- Not to include most or all the State of Mato Grosso in the System as it alone is responsible for more than 60% of the total cost.
- Establish the system gradually setting up medium and long-term goals.
- Harness the income derived from the exploitation of the conservation units of direct use.
- Convert the external debt in return for conservation action, i.e. a debt swap for nature.

Today, the most representative groups of the international scientific community, governments of developed countries, and non-government organisations all demand that measures are taken to stop ecological degradation in the Brazilian Amazon. We are among those who have raised the alarm, who take concrete measures to preserve whatever possible and who fight against destruction. However, as it has been shown, the problems of the tropical forest, which are not solely Brazilian but also concern other South American nations, can only be effectively addressed when all parties interested in biodiversity face the economic reality as a matter of fact and without fear.

Will the countries of the first world, the development agencies and the Brazilian government be willing to face this challenge?

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C. Verret

Combating Forest Fires in El Avila National Park, Venezuela

El Avila, the mountain symbol of Caracas, has a sector that has suffered from disturbance to its natural habitats since the time of the aborigines. This situation grew worse with the arrival of settlers who practised agriculture and cattle raising until it was declared a National Park in 1958. The link with the capital city for more than 400 years has resulted, on one hand in the protective actions initiated in 1936 to conserve and regenerate the catchments that provide the population with drinking water, but on the other it has also suffered from the impact of forest fires and human destruction of the forest which has consequently given way to a "montane savanna" consisting mainly of exotic grasses.

El Avila National Park itself is located in the mountain system of the central northern coastal region of Venezuela, has an area of 85,192 ha, a total length of 87 km and a maximum width of 16 km. It extends in an east-west direction parallel to the coastline of the Caribbean Sea and its topography clearly defines two watersheds. In the southern watershed of the park, adjacent to the city of Caracas, the natural vegetation comprises forest between 1,000 and 1,600 m, cloud forest between 1,600 and 2,000 m and sub-paramo between 2,000 and 2,765 m, the maximum altitude of the park. The mean temperature ranges from 10°C to 21°C, and mean rainfall between 800 and 1,500 mm. The dry season, which is when fires occur, occurs from December to May.

The abrupt topography has led to a drainage system with a large number of parallel water courses that form a network of 16 main ravines in front of the urban area of Caracas. These water courses originate in the highest part of the park

Caracas and El Avila National Park.
Photo: Román Rangel.

From a tube of 1 1/2" diameter, three high pressure hoses can be derived to attack forest fires effectively.
Photo: J R Garcia.

close to the boundary between the watersheds and drain from north to south for approximately 10 km before flowing into the Guaire river that crosses the city from east to west.

The Hydro-Protection System

At the beginning of the 1960s there were two very large fires in the urban boundary. They lasted for 15 days finally reaching the line dividing the two watersheds and affecting an area of approximately 3,000 ha. To aid the recovery of these burnt areas, programmes of reforestation, development of a hydro-protection system, training of personnel and the formation of voluntary groups were started.

To fight vegetation fires in each of the 16 ravines a number of systems for the collection, storage and distribution of water has been developed. Each system consists of a collection dam constructed on the ravine bed, one or more storage tanks and a galvanized iron pipe system to distribute water through the pipes of various diameters between 2.5 cm and 7.5 cm. The pipes are interrupted intermittently by hydrants for direct connection to forest hoses. The area covered by these 16 ravines is in the order of 6,500 ha.

The system uses gravity to carry water at high pressure through the pipe lines. Up to 500 lbs/in^2 (35 kg/cm^2) of static pressure have been recorded, which allows the use of lengths of fire hose with very good pressure for fire fighting.

The Hydro-Protection System of the park has a total of 70 km of tubing, 20 collection dams and 29 storage tanks with a total volume of approximately 3.5 million litres. The density of hydrants is much higher in the final branches that reach to the upper limit of the main fire-break (see below) and so create a continuous protection barrier.

Operation of the System

The planning and implementation of the fire prevention and fighting programme are carried out by the Dirección General de Parques Nacionales, operating from the "Pajaritos" camp, located on the margin of the gorge of the same name. It has been specially designed and has

direct access to the road system that defines the border between the park and the city.

The camp has basic installations for the programme such as: radio communications centre; parking for the reservoir and fire fighting units; data centre, administrative offices, training centre, auditorium and specialised library; dormitories, kitchen, dining room and services for the fire guards; mechanical workshops for the repair of vehicles and motor pumps; a general store of materials and equipment for fire fighting; and sports courts and leisure areas.

The system is coordinated by the Special Programme and is operated by the park guardians and by a specially trained brigade that keeps a 24-hour watch during the dry season. The park also has the dedicated collaboration of nine voluntary groups who man auxiliary camps, especially during weekends and holidays. During the dry season they attend to the emergencies, false alarms and fight fires while in the rainy season they undertake cleaning, maintenance and testing of the hydro-protection system and especially a permanent training programme. All these personnel are duly trained for fighting forest fires as well as for search operations, terrestrial salvage and helicopter operations.

The system for fighting fires with water has the following features in El Avila National Park:

- Direct connection of hoses to hydrants, working with the pressure generated by gravity.
- A system for pumping directly from any water source, gorge, reservoir or hydrant using a series of motor-pumps (there is experience of pumping water through extended hose lines for distances of more than 6,000 m).
- Fire fighting over mountain roads using four-wheel-drive vehicles carrying small water tanks with a capacity of 1,000 l.
- Fire fighting, or repumping, from the urban perimeter using water tankers with a capacity of 6,000-10,000 l.
- Fire fighting or damping down burnt areas with sprayers or forest beaters.

The park's main fire break has been constructed parallel to the urban limit up to an altitude of 1,100 m and with a length of approximately 30 km and a width of 30 m. In

Fire-fighting vehicle recharging its 10,000 l water-tank.
Photo: Mario Gabaldón.

Direct connection of hoses to water-pipes, working under the pressure of gravity, which can generate pressures up to 3.5 kg/cm²
Photo: Mario Gabaldón.

some sectors where there is a permanent water supply green fire-breaks covered by San Agustin grass *Stenotaphrum secundatum* have been developed. These stay green throughout the dry season and have given very good results in the control of fires while at the same time providing recreational spaces for visitors.

In time, with the implementation of these programmes, a very efficient control has been achieved that has led to a considerable decrease in the area affected by fires. In consequence, there is a progressive substitution of the savanna by species of the original forest through natural succession.

At present, the greatest number of fires occur in the savanna covered sectors and the statistics in the last five years indicate that the average fire-fighting time is three hours. The number of false alarms and fires is in the order of 78 per year, and the average affected area is in the order of 100 ha per year.

Conclusions

The success of this fire fighting programme has been based on the technical training of professional and voluntary personnel, and particularly in the atmosphere of work and desire for service shown at all opportunities by these keen and efficient guardians.

The National Parks Service of Venezuela is able to offer logistic support to carry out graduate work, exchange of experiences or training in the "Pajaritos" Fire Camp. In addition, the "Programme for the Prevention and Fighting of Fires, Searches and Salvage" can be contacted for any consultation or technical advice at the following address:

Instituto Nacional de Parques - INPARQUES
Dirección General de Parques Nacionales
Apartado de Correos 76471
Caracas 1070A Venezuela

José Rafael García

CONVENTIONS UPDATE

THE WESTERN HEMISPHERE CONVENTION

In the year marking the 500th anniversary of the European landfall in the Americas, it would be unfortunate if we did not also mark the 50th year of one of the world's earliest multilateral conservation agreements and the first international treaty for parks and wildlife in the Americas – The Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.

For 450 years, colonial powers and sovereign nations independently exploited, exported or conserved natural resources at rates proportionate to their respective technological capability. According to Richard Cunningham (NPS) who has reviewed some of the biological impacts of the 1492 arrival in a recent paper, many of the environmental changes have been disastrous. Perhaps this is most clearly evidenced in the Caribbean. Cunningham notes that by 1550, 57 years after the founding of the first permanent New World colony, the first mammal became extinct. Moreover, between 1600 and 1973, six birds and ten reptiles became extinct in the West Indies; and of the 39 species of Western Hemisphere mammals that became extinct in the same period, 34 species were native to the West Indies. By comparison, North America has lost only eight terrestrial vertebrate species since 1600.

In 1942, with extraordinary vision, a Convention was enacted that challenged the sovereign States within the Western Hemisphere to identify nationally significant natural sites of superlative scenery and areas containing flora and fauna which the general public might enjoy, and to establish these areas as National Parks and Reserves, Nature Monuments and Strict Wilderness Reserves. Migratory birds and species threatened with extinction were equally recognised as representing the shared transboundary concerns of Western Hemisphere nations.

In recognition of the disparate capabilities in protected area and species management within the region, international cooperation between the Parties is integral to the Convention. The Pan American Union (now the Organisation of American States) was designated as the Secretariat to the Convention.

Despite the war years which immediately followed the enactment, the pace of government designation of National Parks and similar protected areas grew steadily in the region, eventually surpassing most of the rest of the world.

When it reviewed the Convention over a decade ago, the OAS and participants from within the region concluded that little if any improvement could be made in the intent or text of this document. In fact, an old adage was invoked, "If it isn't broken, don't fix it." However, if we performed a similar review today, would we draw the same conclusion?

The need for cooperation within and between nations in the Western Hemisphere has unquestionably increased in response not only to improved understanding of transboundary ecosystems, the more precise charting of seasonal movements of species, and rapidly increased development pressures, but also because effective conservation requires more than just designating protected areas. It requires a combination of effective resource management agencies, a supportive and knowledgeable public and a sharing of data, information and experience through well defined partnerships to address the complexity of environmental, social and economic issues facing every park manager.

Robert Milne
Chief, Office of International Affairs,
National Park Service, Washington D.C.

Coastal and Marine Protected Areas in the Caribbean : How Can We Make Them Work?

Tom van't Hof

There are some 135 legally established coastal and marine protected areas in the wider Caribbean. However, about 75% of those are not really protected because they do not have effective management. Economic analyses of these protected areas, greater involvement of voluntary organisations in managing them, and revenue generation by and for those protected areas are required to improve their function. This would provide major investment opportunities for donor agencies.

A study conducted by the Organisation of American States (OAS) lists 135 legally established coastal and marine protected areas (CAMPAs) in the Wider Caribbean (OAS/NPS, 1988). The study divides most Caribbean CAMPAs into two broad categories:

1. "wildlife reserve-like", with emphasis on protection and limited public use for education (57 areas);
2. "park-like", with emphasis on protection as well as public use (68 areas).

Among the 135 areas identified in the OAS study are protected areas which are completely marine, as well as areas which have a subordinate marine or coastal component, varying from a sizable percentage to a fringe bordering the shoreline. Thirty-eight areas are classified as "marine" (defined as including barrier reefs, patch reefs, seagrass beds or open ocean), 60 as "coastal" (defined as including fringing reefs, seagrass beds and other coastal and estuarine habitats), 20 as "island", in which small islands, atolls or archipelagos are an important component, and 16 as "highland", in which the coastal or marine component is merely a fringe of a terrestrial protected area (OAS/NPS, 1988).

Two other aspects need to be taken into account in characterising Caribbean CAMPAs: their value for tourism and recreation and their respective date of establishment. Eighty per cent of the Caribbean CAMPAs have been established since 1967 (OAS/NPS, 1988). Among the major uses and values of the protected areas, tourism and recreation are mentioned for 68 areas, and important wildlife habitat in 78 (OAS/NPS, 1988). This is not surprising, since many CAMPAs contain the kind of environment that attracts millions of tourists annually, particularly coastal or marine areas. Likewise, many contain one or more of the three important coastal ecosystems: coral reefs, mangrove forests and seagrass beds, which have great value as wildlife habitat.

Management

In about three fourths of the Caribbean territories, the management of parks and protected areas is the exclusive responsibility of government. In the English speaking Caribbean we find a few examples of areas managed by a national trust, or sometimes managed jointly by a trust and by government. Only three countries have protected areas managed by private organisations: the Bahamas and the Netherlands Antilles, where the responsibility for managing protected areas is delegated entirely to private organisations, and Belize, where some areas are managed by a private organisation.

The major problem faced by these areas is a serious lack of effective management. In a survey of management in 54 Caribbean CAMPAs, Van't Hof (1988) distinguished 15 management "indicators" including various forms of legal control, enforcement, personnel, research and educational activities. Although a wide variety of legal controls on resource use exist, only 24% of the protected areas surveyed claimed to have effective day-to-day management.

Many Caribbean marine protected areas are associated with coral reefs. Photo: Tom van't Hof.

Almost half of the areas had no personnel assigned to them and regulations were only enforced in less than one-third of them. This data is well in line with the findings of the OAS study, which indicate that only 29% of Caribbean CAMPAs are "fully protected" - 16% only if the US protected areas are excluded (OAS/NPS, 1988). Considering that 80% are of fairly recent origin, it is clear that in most Caribbean countries the capability to provide funding for effective management of protected areas has lagged far behind their establishment.

The lack of effective management has its price. About half of the protected areas for which information is available report a wide range of disturbances which have led to degradation of the resources (OAS/NPS, 1988). The result is that about three-fourths of the Caribbean coastal and marine protected areas are not fulfilling their functions in protecting vital ecosystems or wildlife habitat, providing for sustainable use of resources, or providing for recreational opportunities and public education.

Improving management effectiveness

In order to improve management effectiveness in the long term, protected areas must enjoy proper public support, must have an effective institutional structure for administering them, and adequate funding for management. This can best be accomplished by focussing on the following issues:

- demonstrating the economic importance of properly protected CAMPAs, especially in relation to fishing and tourism;
- increasing the role of NGOs in management;
- promoting revenue generation by protected areas to make them self-financing.

Economic importance

Tourism is a major industry in the Caribbean. Tourism expenditures in 32 Caribbean countries in 1988 were estimated at well over US$7 thousand million. This contribution to gross domestic product is especially significant in small island countries and averaged 60% in 1988 in 20 countries of less than 800 km^2 and 300,000 population (McElroy and de Albuquerque, 1989). Although the portion of tourism expenditure which can be attributed to the existence of coastal and marine protected areas is unknown, the available data on visitation and visitor expenditure

in CAMPAs suggests that it is significant. We can assume that a considerable portion of Caribbean tourism is based on the scenery and attractions of the coastal and marine environment. Well-managed protected areas maintain the quality of that environment.

The economic importance of Caribbean coastal and marine protected areas for tourism has been described by several authors (see Dixon and Sherman, 1990; Van't Hof, 1985) and should be easily demonstrated with the growing market for special interest tourism. Economic analyses of costs and benefits must be carried out to help building support. In the case of the non-functioning protected areas, such analyses could be particularly useful in showing the benefits foregone by not adequately protecting or managing the area. They must, however, take into account the environmental and social carrying capacity of the protected area, in order to provide realistic data on the potential economic benefits from tourism.

Trade-offs can be important incentives to build support for managing protected areas among local communities. Few examples exist in the Caribbean but two experiences are noteworthy. In St. Lucia, the application of community based resource management, including employment of fishermen as guides and wardens in protected areas, has contributed to local support for the management of resources. In Belize, the establishment of the Hol Chan Marine Reserve gave such a boost to the development of the diving industry and related employment in San Pedro on Ambergris Cay, that neighbouring communities proposed the establishment of additional marine protected areas.

Protected areas which restrict or ban fishing activities could have a major impact on improving reef fish populations. Based on the positive impact of fishing controls in Australia, the Philippines and the Florida Keys, marine fishery reserves are being proposed as a management option which would benefit reef fish fisheries in the US Southern Atlantic (Plan Development Team, 1990). The potential of fishery reserves in providing recruits to nearby fished areas should be a major incentive for protecting critical reef fish spawning stock.

Institutional structure: the role of NGOs

As noted earlier, three-fourths of the Caribbean coastal and marine protected areas are managed by government. Although some countries have a national park service

Many marine protected areas have installed permanent moorings to prevent anchor damage to fragile benthic communities and to accommodate diving and snorkelling. Photo: Dee Scarr.

or directorate in one of the Ministries, in the small island countries protected area management is often an added responsibility of the Forestry or Fishery Department. The respective responsibilities of different agencies for protected area management are not always clear. Government agencies are typically bureaucratic and slow to respond or act, because of the limited freedom of civil servants to take responsibility. Governments seldom allocate sufficient funds for the adequate management of protected areas.

NGOs are more flexible, have a better capability to act, and, most importantly, can generate revenue for protected area management. Although there are presently only two countries in the region which have delegated the responsibility for managing protected areas entirely to an NGO, and although many countries lack NGOs or sufficiently strong NGOs to assume a similar role, local NGOs could certainly be equipped to manage protected areas under contract by government. Projects to strengthen local NGOs in the Eastern Caribbean are taking place under the Caribbean Heritage Program. Their further institutional development, with a view to managing protected areas on behalf of governments, could create significant investment opportunities.

Revenue generation

The inability of most protected areas to generate funds to benefit their management is closely related to their governmental status. Even if they were allowed to generate revenue, this would probably benefit the general treasury, not the protected area.

Several ways of revenue generation are potentially promising for coastal and marine protected areas: user fees, concession fees, souvenir and book sales, sponsoring, donations and memberships. User fees and concession fees will be of special importance to those areas where tourism (particularly special interest tourism) is a primary use. Their implementation requires that the collection of such fees has a solid basis in legislation. User fees are presently not widely applied in CAMPAs, but will be more common in the next few years as a number of protected areas are in the process of introducing them. Some donor agencies have even stipulated user fees as a requirement for funding of protected area projects. Economic analyses carried out by OAS for the Tobago Cays Marine Park in St. Vincent and the Grenadines and for the Montego Bay Marine Park in Jamaica have incorporated user fees. These analyses demonstrate high benefit/cost ratios and the possibility for these protected areas to become self-financing.

Conclusion

Conducting economic analyses, strengthening NGOs and devising revenue generation techniques with a view to making the region's coastal and marine protected area system more effective, are urgently needed and will provide major investment opportunities for donor agencies.

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A Technical Cooperation Network for Protected Areas in Latin America

Kyran D Thelen

Systems of protected wildland areas have been established by all countries in Latin America and their management is now viewed as an important and legitimate land use. Advancements made in the management of protected areas have not, however, been similar amongst the countries of the region and, until recently, collaboration in seeking solutions to common problems has been minimal amongst the responsible institutions and specialists. This article examines a mechanism which has been established in the Latin American region to promote cooperation in the exchange of information, experience and knowledge between countries and to search for solutions to common technical problems faced in the development of protected wildland areas.

For many years the countries of Latin America and the Caribbean region have received technical assistance as well as bilateral and multilateral cooperation from developed countries. More recently, however, the countries of the region have become aware that, despite the benefits of this cooperation, imported technology often did not completely meet local requirements and realities.

Technical Cooperation Networks

This, combined with the need to circulate more widely knowledge and experience within the region and to achieve more efficient means of assistance in technological sectors, led to the establishment of a programme for Technical Cooperation among Developing Countries (TCDC).

The principles of this cooperation were established in the United Nations Conference on Technical Cooperation among Developing Countries, held in Buenos Aires in 1978. The governments of the region called upon FAO to assist in the application of this new mode of cooperation and in 1979, with the assistance of the Regional Office for Latin America and the Caribbean, they began to establish technical cooperation networks in a number of priority areas.

The technical cooperation networks enable national institutions to exchange experiences and knowledge, using their own human, financial and technical resources in finding solutions to common problems. They cover a given technical subject and, through the participation of national institutions, share their experiences and knowledge for mutual benefit. Using this mechanism they can act in a coordinated manner and complement technical capabilities, thus enabling a more efficient utilization of resources and avoiding unnecessary duplication. TCDC Networks also allow countries with more experience to transfer this knowledge to countries less advanced in a particular technical area.

The Networks function through such activities as technical meetings, workshops, study trips, technical exchanges, group and individual training, as well as the exchange of information, publications, audio-visual material, and cooperation in the identification and design of pilot projects.

The Latin American Technical Cooperation Network

The creation of a technical cooperation network on protected areas was a response to the desire of the Latin American countries to improve the conservation

Directors of the national park systems of Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela sign an agreement to establish a sub-regional network covering protected areas in the Amazon.
Photo: H. Peters.

and development of protected areas in the region, and the confidence that this could be accomplished most effectively through the sharing of their combined technical skills and experience. In 1983, the Regional Office of FAO convened a round table in Santiago, Chile, with participants from eight countries.

Following an analysis of common problems related to wildlands and wildlife management in the region, the countries agreed to establish the Latin American Technical Cooperation Network on National Parks, other Protected Areas and Wildlife. In each country, a national coordinating institution and a regional coordinator were nominated. The Regional Office of FAO was asked to help organise the Network and serve as technical secretariat.

The general objectives of the Network are to collaborate in the effective management of protected areas and wildlife; to facilitate the establishment of a regional data base on biotic resources; to collaborate in protecting an adequate representation of biological diversity; to improve personnel training for the management of protected areas and wildlife; and to cooperate in improving the contribution of protected areas to improve socio-economic conditions.

Programmes of the Network are established by consensus of the Network members on priority issues which warrant collaborative action. These have included activities in such subject areas as systems of protected areas, planning of protected areas for biogeographic regions shared by two or more countries, ecotourism, research, education, community involvement in protected areas, frontier parks, biodiversity and *in-situ* conservation of genetic resources. These shared concerns are dealt with on a regional or sub-regional basis through workshops, training courses, technical exchanges, preparation of manuals, or a combination of these mechanisms.

While approaches vary, the Network often initiates a programme by a thorough study of the subject by national institutions in each country. A workshop of specialists from each of the countries is then organized to analyse the situation in a regional context, formulate conclusions and recommendations, and establish a plan for collaborative action. An important result of each workshop is a technical manual for use by the member countries in follow-up actions such as national seminars and training courses.

National networks are essential to follow-up activities at the country level and are becoming

indispensable in many countries for achieving an articulated approach to protected area planning and management. In the past, the responsibility for protected areas was often limited to one government institution. Now the responsibility is often shared with many institutions at various governmental levels, as well as with non-governmental organizations and the private sector, and cooperation is essential.

The Network also serves as a mechanism to achieve bilateral and multilateral cooperation on areas shared by two or more countries. It has facilitated collaboration amongst countries in collaborative actions on a number of border protected areas as well as in the joint planning for biogeographical regions.

For example, a plan for a system of protected areas in the Gran Chaco Americano has been prepared through a collaborative effort by Argentina, Bolivia and Paraguay and several activities have been carried out regarding the Amazon region through cooperation by Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela. Because of its enormous importance for conservation of biodiversity and the collaboration necessary, a sub-network has recently been established to coordinate work in the Amazon.

Communications and Information Exchange

A fundamental aim of the Network is to ensure a fluid interchange amongst the countries it serves. It has developed a programme which includes the preparation, publication and distribution of technical documents and the editing of a technical bulletin and circular newsletter. These documents are distributed through a computerised registry of specialists and institutions in the region.

An essential communication element of the Network is its Technical Journal, *Flora, Fauna and Protected Wildland Areas*. It has proved to be an invaluable vehicle for distribution of protected area information throughout the region. It provides a means for specialists in parks and protected areas in the region to relate their experiences, express their concerns on issues and communicate their ideas to colleagues in other countries.

National Parks and Protected Areas have not developed at the same rhythm within the countries of the region. Some have accumulated considerable experience while others have only recently initiated programmes. This provides an opportunity for countries more advanced in protected area

Publications and interchange of technical information is an important objective of the network.
Photo: H. Peters.

management to assist those with less experience in a certain technical area. At the same time there has been a tendency in most countries to curtail government spending, severely limiting the funds available to protected area institutions. This has increased the importance of sharing highly specialised personnel amongst the countries of the region.

The Network has been able to facilitate this mutual assistance through short term technical exchanges using experienced professionals from member institutions. The procedure is for a country needing assistance to request the secretariat of the Network to locate, from among the nearly one thousand members of the Network who have agreed to collaborate in the programme, the most qualified person to carry out a specific task. The specialist selected is then contacted to verify that he is available to carry out the assignment. If he agrees, his salary costs are borne by his employer, the Network pays travel costs and the country requesting assistance covers in-country expenses.

Conclusion

Despite the success of the Network, which has been supported operationally by an FAO/UNEP Project on Wildland and Wildlife Management, it has challenges to meet. A recurring problem in many countries is the high turnover of personnel, which contributes to a lack of continuity in follow-up activities. For a Network to be truly effective at regional level it must have strong networks at the national and local level. In many countries national Networks are only beginning to function effectively and to incorporate the many governmental, non-governmental and private organisations concerned with protected area issues.

Despite difficulties, the need to share technical knowledge and experience and develop close and harmonious relationships amongst the institutions and specialists who are working toward common goals in parks and protected areas throughout the region is more important now than ever before. The Latin American Technical Cooperation Network on National Parks and Protected Areas and Wildlife has a large part to play in achieving this collaboration.

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Collaborative planning of cross-frontier protected areas (here the Iguazu National Park between Argentina and Brazil) is an important activity of the Network.
Photo: Jim Thorsell.

SPOTCHECK

Updates on protected area issues

Solitary Islands Marine Reserve off Coffs Harbour, is situated 600 km north of Sydney, New South Wales (NSW), Australia. It covers some 100,000 ha of rich marine and estuarine habitats and is the first marine protected area in the country to cover a complete succession of the coastal aquatic environments surrounding islands and headlands and including beaches, off-shore rocky and coral reefs, and estuaries.

A significant biological diversity is attributed to a bio-geographic overlap of aquatic communities. A warm current from tropical waters mixes with a cooler southern current resulting in a fascinating mix of corals and fish from the Great Barrier Reef living with species from as far south as Tasmania. Indeed many species occurring in the Reserve are situated at their geographical extreme; the red mangrove *Rhizophora stylosa* occurs here at its southernmost location in the world.

Protection of much of this coastal environment is further extended due to the existence of adjacent national park areas. Large portions of the water catchments to five estuaries of the Reserve are safeguarded from over-exploitation and development. The Sandon River, which is at the northern end of the Reserve and almost completely surrounded by Yuraygir National Park, is considered to be the most pristine estuarine system existing in NSW today. Six of the seven islands within the Marine Reserve (above the high tide mark) have been declared nature reserves to protect nesting sea birds.

Management of this complex succession of coastal environments is jointly undertaken by NSW Fisheries and NSW National Parks and Wildlife Service (NPWS). Generally, NSW Fisheries manage the aquatic resources of the area while terrestrial flora and fauna are controlled by NPWS. Combining these resources and skills

The Sandon River mouth looking into Yuraygir National Park. This is considered to be the most pristine estuarine system in New South Wales today (left).
South West Solitary Island (shown above left) has coral cover of 100% in some areas.
Photos: Dave Clayton

results in more effective habitat protection through co-ordinated policy making, enforcement and public education.

Gazettal of the Solitary Islands Marine Reserve on May 11 1991 marked the end of over 21 years of lobbying, research, regulatory restructuring and drafting of management guide-lines. The climax of this process began in 1989 when a Planning Officer (Dave Clayton) was contracted by NSW Fisheries Department to collate available biological data and combine it with user information to produce a Draft Management Strategy. The Strategy utilised multi-use zoning to conserve important habitats while allowing most uses to continue.

This draft document was available for public comment during July and August 1989. Dave was positioned in Coffs Harbour during this period to educate local communities about the area's natural and cultural significance, why these features should be protected, how NSW Fisheries proposed to do it and, most importantly, to encourage interested organisations and individuals to comment on the Draft Management Strategy. In short, the concept of aquatic protection was "soft sold" to the public.

All media types, including television, were utilised. The most effective was a polished slide show and seminar presented by the Planning Officer. Open public meetings were avoided as conflict usually developed amongst the various user groups. Instead talks were aimed at specific user groups so as to address the issues unique to each group. This face-to-face friendly approach resulted in strong positive support from all groups, including commercial fishermen.

Over 120,000 people were represented in submissions which were analysed by an Advisory Committee comprised of representatives from each major user group. This committee's recommendations were used to amend the draft strategy into the comprehensive zoning plan that is now used to manage the Reserve. Because users feel they have significantly contributed towards the management and gazettal of the Reserve, NSW Fisheries now enjoys almost complete community support which is resulting in a more aware and obliging public. To date no convictions have been issued.

The existing zoning plan is due for public review in five years. A similar process to that used in 1989 will again be employed to ensure that management of this productive and scientifically important area reflects the needs and wants of its human visitors. Ongoing public review is considered essential to successful management as aquatic habitats and communities of the Reserve are the ultimate beneficiaries of a harmonious relationship between the Government and its public.

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Progress Towards a Global System of Marine Protected Areas

The importance of devising methods to manage and protect marine environments and resources first became apparent during the course of the 1950s and early 1960s. Since that time there has been growing concern about the dangers posed by the increasing technical capability to exploit mineral resources on or beneath the sea bed, to modify the sea bed and coastline, to exploit fishery resources and by the increasing release of pollutants into the sea.

The area of sea and sea-bed is more than two and half times as great as the total area of land of the world, but less than one per cent of that marine area is currently within established protected areas.

The result is that many areas now face serious threats, including stress from pollution; degradation and depletion of resources, including species; conflicting uses of resources; and damage and destruction of habitat. It is clear that conservation efforts for the marine environment have lagged far behind those for the terrestrial environment, and an integrated approach to the management of the global marine ecosystem has not yet been implemented.

Development of Guidelines

Recognising these problems the 4th World Wilderness Congress in 1987 and the 17th Session of the IUCN General Assembly in 1988 both passed resolutions that called on national governments to initiate the development of national systems of marine protected areas (MPAs). The term "marine protected area" is defined as:

"Any area of inter-tidal or sub-tidal terrain, together with its overlying waters and associated flora, fauna, historical and cultural features, which has been reserved by legislation to protect part or all of the enclosed environment".

The IUCN's Commission on National Parks and Protected Areas established the position of Vice-Chair Marine to reflect the requirement of placing a greater emphasis on marine conservation. I was appointed to that position in 1986, with the task of accelerating the development of the global representative system of MPAs.

As a first step in developing the MPA system, and to facilitate a coordinated and cooperative approach to the task, it was important to establish a set of guide-lines for governments, agencies, non-government organisations and individuals. In developing the guide-lines (Kelleher & Kenchington 1991) we focused on the necessity that the document had to be made widely available and at a low cost. The key sections of the guide-lines cover:

- selection of marine protected areas
- legal considerations for the protection of marine and estuarine areas and resources
- guide-lines for planning MPAs
- biosphere reserves in the marine environment.

The Guide-lines will be published and distributed to all delegates at the 4th World Congress on National Parks and Protected Areas.

The Global Representative System of Marine Protected Areas

Having finalised the guidelines, we went on to establish the framework for developing the global representative MPA system. This involved dividing the world into a network of marine regions, and appointing a working group leader to coordinate the programme in each region. The role of the working group leaders is to identify and recruit a small team of experts to attain the aims outlined below:

1 dividing the region's marine environment into its major constituent biogeographic zones
2 identifying gaps in the representation of MPAs of those zones
3 proposing sites for the establishment of MPAs to fill those gaps.

Central to the process of assessing possible sites for the establishment of MPAs is the set of selection

criteria that has been developed. These cover the categories of naturalness, biogeographic importance, ecological importance, economic importance, social importance, scientific importance, international or national significance and practicality/feasibility.

The first goal of the programme was for all working groups to have completed Aims (1) and (2) in time for inclusion in the global protected areas review at the 4th World Congress on National Parks and Protected Areas. At the Congress each CNPPA realm Vice Chair will present a review of the marine and terrestrial protected areas network within his or her realm. The report of each marine working group will feed into these Vice-Chair reports.

It is worth noting that the CNPPA realms were defined largely to serve the function of improving the world's system of terrestrial protected areas. Not surprisingly, their boundaries are not ideal from the marine viewpoint. For this reason the marine regions do not coincide with the CNPPA terrestrial realms. Coordination between the marine working group leaders and the CNPPA realm Vice-Chairs has therefore been very important.

The Present Position

The current status of the programme is that all working group leaders have been appointed and the majority are on target to complete Aims (1) and (2) on schedule. In some instances progress has been beyond expectations. The Caribbean and Mediterranean marine regions, for instance, expect to have submissions concerning aim (3) for the Congress.

Australia's contribution to the international programme flows from its Prime Minister's commitment at the IUCN General Assembly held in Perth in November 1990 to "work towards the expansion of Australia's marine reserve system" and in association with the State and Territory Governments, to "investigate the establishment of a national representative system of marine protected areas for Australia that will protect these areas, while permitting appropriate uses and promoting public education".

Conclusion

It is obvious that this work will never be completely finished. New approaches to protecting marine areas will inevitably lead to additions to, and refinement of any existing global system of MPAs.

My own personal vision, which derives naturally from our experience with the world's only MPA covering a complete ecosystem, is that the ecosystem approach to management of the world's coastal marine areas will become the norm. I believe that the very great benefits of managing complete ecosystems in an integrated way, and the costs of not doing so, mean that there really is no viable long-term alternative. Indeed, I think that integrated management of the coastal zone, covering both the land and the sea, is the objective to which we should all aspire.

References

IUCN, (1988). Resolutions and Recommendations of the 17th Session of the General Assembly of IUCN.

Kelleher, G K & Kenchington, R A (1991). Guide-lines for Establishing Marine Protected Areas. Great Barrier Reef Marine Park Authority/UNESCO/IUCN

Australian Prime Minister Hawke's statement of 28 November at the 18th Session of the IUCN General Assembly in Perth, 1990.

Graeme Kelleher (Vice Chairman–Marine, CNPPA) and Chris Bleakley (IUCN/Special Projects Officer, Great Barrier Reef Marine Park Authority, GPO Box 791, Canberra ACT 2601, Australia)

Abruzzo National Park

In October 1991 an international gathering took place at Pescasseroli, in the heart of the Abruzzo National Park, in the Apennine Mountains of Central Italy. Representatives from Great Britain, Norway, USA and Greece were invited to the Park by the Italian Committee for National Parks and Equivalent Reserves. At an international session attended by about sixty people, they contributed papers on the situations in their own countries. There are major problems in each one but also common themes of growing public sympathy for the

environment and exciting progress in nature conservation.

The conference could not fail to be extremely impressed by the achievements and progressive ideas of Professor Franco Tassi, the Director of the Abruzzo National Park and Chairman of the National Parks Committee for Italy. Over the last ten years there have been several major extensions to Abruzzo National Park which supports thriving populations of golden eagle, peregrine, wolf, chamois, red deer, roe deer, and the indigenous Marsican brown bear.

These extensions to the park have been almost universally popular because of the incontrovertible evidence that the National Park is proving highly beneficial to employment and the local economy. The needs of nature conservation have been fully integrated with local culture, archaeology, and the social skills and needs of the area.

Through active involvement with local residents, particularly in the beautiful hilltop villages, ecotourism and encouragement of suitable small-scale developments, a head of steam has been produced for extending the concepts of Abruzzo across a far larger area, including a long length of the Adriatic coast. There is no reason why this ambitious plan should stop here. Other countries could well benefit from studying the Abruzzo phenomenon.

Richard Hornby (Nature Conservation Bureau)

Developing a protected areas system in Italy

① *Existing National Parks*
1 *Gran Paradiso*
2 *Stelvio*
3 *Abruzzo*
4 *Circeo*
5 *Calabria*

❶ *National Parks proposed by the Italian Committee for National Parks and Equivalent Reserves*

Latin America Prepares for World Congress

Prior to the IV World Congress of National Parks and Protected Areas, consultation meetings were carried out in Guatemala, Nicaragua and El Salvador (June), Honduras and Panama (July) and Costa Rica and Belize (August). The meetings were sponsored by IUCN and CNPPA and organized by them and the relevant national institutions: National Protected Areas Council of Guatemala; Natural Resource Institute of Nicaragua; National Commission for the Environment, El Salvador; Honduran Corporation for Forestry Development; Natural Renewable Resources Institute Panama; Ministry of Energy and Mines of Costa Rica and the Audubon Society of Belize. More than 150 people from over 80 public and private institutions, from sectors such as national parks, fisheries, energy, tourism, cultural heritage, environment and forestry, met to consider issues related to the vulnerability and development of their national protected area systems. The meetings concluded by identifying the most important factors to be addressed in the next decade, and how CNPPA could better support its network at the regional level.

Juan Carlos Godoy

PADU NEWS

Jeremy Harrison
Head of the Protected Areas Data Unit
describes the work of his Unit

The World Conservation Monitoring Centre (WCMC) is jointly managed by IUCN - The World Conservation Union, The World Wide Fund for Nature, and the United Nations Environment Programme.

Its mission is to support conservation and sustainable development by ensuring that decisions affecting biological resources are based on the best available information. This is achieved through collection, management and dissemination of information relevant to the conservation of nature, and by the promotion and development of networks to facilitate information flow.

The general objective of WCMC's work on protected areas, therefore, is either to be able to provide accurate up-to-date information on the protected area systems of the world to those who need it, or to be able to identify from where to obtain that information quickly. Specific objectives are to:

- keep under review the lists of the world's protected areas, and to maintain a database on these protected sites;
- hold definitive, standard format information documents summarising the protected area systems of individual countries;
- hold maps of all protected area systems, and gradually digitise them;
- hold definitive, standard format information documents on major individual protected areas (particularly in developing countries);
- accumulate current and historical literature on protected areas; and
- provide support to international initiatives, programmes and conventions relating to protected areas issues.

This work is not done independently, but in collaboration with the many agencies around the world managing protected areas, and with a range of individuals who have interests in this field. Many of those involved are members of the IUCN Commission on National Parks and Protected Areas. WCMC also has a particular responsibility for managing information on Biosphere Reserves, World Heritage sites and Ramsar Sites, working closely with the secretariats concerned.

WCMC has been preparing for The IV World Congress on National Parks and Protected Areas over the last few years. A number of products have been produced specifically for the Congress including *Protected Areas of the world: a review of national systems* and various regional protected areas directories. Such information, together with WCMC's protected areas database of some 26,000 sites, provides a solid foundation on which to build during and subsequent to the Congress. WCMC will also be using the Congress as an opportunity to explore new avenues for exchanging information on protected areas and developing new initiatives in collaboration with interested parties.

Items for inclusion should be sent to: Protected Areas Data Unit, World Conservation Monitoring Centre, 219c Huntingdon Road, Cambridge CB3 0DL, United Kingdom.

BOOKS

Reviews of important new books

Nature Reserves - Island Theory and Conservation Practice.
Craig L. Shafer (1991). Smithsonian Institution Press, 13311 Monterey Avenue, Blue Ridge Summit, PA 17294-0900, USA. 189pp. $15.95.
With a worldwide network of almost 7000 protected areas covering 4 per cent of the Earth's land surface, management of nature reserves has come to be both a field of study and a profession in its own right. Like other land management professions it rests on a body of knowledge from a spectrum of disciplines ranging through the biological and the social sciences, as well as a set of technical skills and an ability to work in wild lands.

More of a corridor than an island: remnants of riverine forest along the River Danube. What shape of reserve is necessary for the conservation of this habitat?
Photo: Paul Goriup.

So far, nature conservation has largely followed an ad hoc approach and management cannot be said to have been solidly based on science. Natural scientists, however, have found that parks and reserves provide secure natural benchmarks and hundreds of scientific papers emanate each year from these outdoor laboratories.

But while park managers have not commonly been research-oriented, scientists themselves have rarely been management-oriented. The Serengeti National Park in Tanzania provides evidence of the "two solitudes". Here, more than twice as much money has been spent on research as on management over the past 20 years. During this time the park's integrity has suffered, and dramatic reductions have occurred in the populations of elephant, rhinoceros, buffalo and wild dog. There is a great shortage of equipment, facilities and trained staff – and still no approved management plan for the park. Human population pressures are growing all around the park, and for tourists a visit to the park is less rich than it could be.

Why has research not contributed more to conservation management in the Serengeti? First, because little of it was applied. Secondly, the implications of the results of any research were not expressed in a way that managers could use them. Thirdly, little research was conducted on the social and human aspects of conservation, where the real management issues in the Serengeti lie.

Isolated fragments of beech forest cling to steep slopes and gullies in North Island grazing land, New Zealand.
Photo: Paul Goriup.

The frustration of park managers with scientists has grown even further in the past ten years with the rise of the subdiscipline of conservation biology. Managers have often viewed its mathematical models as far too academic to be of much practical use. Concepts of island biogeographical theory were essentially biological and rarely addressed to real questions at the interface between parks and people. Moreover, the design of reserves is rarely a question of ecological science, the determining factors are more typically political and administrative.

In a world in which few options remain as to where wild lands can still be protected, are theories of reserve design too little and too late? Craig L. Shafer has now come forward with a state-of-the-art review of the literature on these theories. Moreover, in *Nature Reserves: Island Theory and Conservation Practice*, Shafer makes an even bolder step to try and make it useful "to the people who have the responsibility to act". He recognises that many reserve managers are confused by the often conflicting complexity in the literature and the lack of application to social and economic issues.

Shafer first cuts a swathe through the mass of scientific literature, mostly published in the past decade. He summarises succinctly and clearly the standard questions of fragmentation of habitat, minimum size of population, designation of secluded areas for species (refugia), shape of reserve and others. He then synthesises and illustrates this information with examples of cases from Asia, Africa, Latin America and the US.

Recognising that "real-world experience in nature reserve establishment often contrasts with advice provided by academia", Shafer hesitates to impose the many implications of theory to the real world. He notes that general rules for nature reserve design are risky but then concludes with 26 general "factoids" that make up his strategy for nature reserves. Many of these general guidelines apply to the human dimension that is a major strength of this book.

Despite much of the detail and fogweed in the emerging field of conservation biology, I found this book considerably more valuable than earlier texts on the subject. Shafer sorts the fragments with a compound eye and will make enough sense to convince reserve managers that conservation biology has a lot to offer.

Jim Thorsell,
Senior Advisor, Natural Heritage, IUCN

This review first appeared in the New Scientist magazine's Weekly Review of Science and Technology, London.

RECENT PUBLICATIONS

Notices of protected area publications

FAO Publications on Latin American Protected Areas

FAO has produced a substantial series of publications on protected areas in Latin America in recent years. Some of the recent titles include: *Action Plan conducive to the management of the Rio Paute Basin (Ecuador)* (Series No. RLAT/83/22-FOR-1, in Spanish); *Recent Workshop on Upper Watershed Management for the Caribbean English Speaking Countries and Suriname* (Series No. TCP/RLA/2309 (MF); *Round Table Report/Technical Consultation on Community Plant Nurseries and their Implication in Hydrographic Basin Management. Tarija (Bolivia) December 1983* (Series No. RLAC/84/13-FOR-3, in Spanish). A full list of publications and their prices can be obtained from the FAO Regional Office in Latin America and the Caribbean, Casilla 10095, Santiago, Chile.

National Park Planning in Peru

The following reports and publications concerning protected areas in Peru have been produced over the last year or so.

Enrique Ferrando G. and Jessica Hidalgo F. February 1990. *Legal Analysis of the Administration and Management of the Huascarán National Park.* 57 pp. Sociedad Peruana de Derecho Ambiental (Peruvian Society of Environmental Law).

Ministerio de Agricultura (Unidad Agraria Departamental) (Ministry of Agriculture, Agricultural Unit) and National Parks-Perú. *Master Plan for Huascarán National Park*, in three section: (i) Background and Analysis; (ii) Conservation Plan for Research and Development; and (iii) Executive Summary. ACDI, FPCN, UNESCO.

National Parks-Perú, World Wildlife Fund and Fundación Peruana para la Conservación de la Naturaleza (FPCN: Peruvian Foundation for the Conservation of Nature). *Management Plan for the Cerros de Amotape National Park 1989-1990.* National Parks-Perú, University of Colorado, Boulder (USA), and Fundación Peruana para la Conservación de la Naturaleza (FPCN: Peruvian Foundation for the Conservation of Nature). *Río Abiseo National Park - Management Plan 1990. 1992.* Volume I.

G. Suarez De Freitas. (In Press). *Diagnosis of the Peruvian System of Natural Protected Areas and Recommendations for their Administration.* Fundación Peruana para la Conservación de la Naturaleza (FPCN: Peruvian Foundation for the Conservation of Nature).

F. Injoque, R. Gutiérrez and L. Manrique. (In Press). *A Proposal of Criteria for the Institutional Planning of the Peruvian System of Protected Areas.* National Parks-Perú.

Summary of Public Comments. Provincial Parks and Wilderness for the '90s.

British Columbia Parks/Forest Service, Victoria. 1991. 143pp.

This report is the product of a public review of parks and wilderness in British Columbia. Public meetings were held throughout the Province during February 1991, with the objective of soliciting public opinion on systematic planning for large protected areas. The report identifies the role of British Columbia's provincial parks and wilderness areas, and summarises the overwhelmingly large response and wide range of opinions presented by the public.

Handbook for Mangrove Area Management.

Editors: Hamilton, L.S. and Snedaker, S.C.(1984).

This invaluable handbook on mangrove management, out of print for some time, is now available in a second impression from The Environment and Policy Institute, East-West Centre, 1777 East-West Road, Honolulu, Hawaii 96848, at US$7 (airmail).

CLIPBOARD

Roundup of world news compiled by PADU

International

New Ramsar sites

New Ramsar sites have recently been notified in three countries: Pürgschachen Moores in Austria, Utonai-Ko in Japan, and Llyn Idwal, Llyn Tegid, Esthwaite Water and Rutland Water in the United Kingdom. This brings the total number of sites to 542 in 63 countries, covering a total area in excess of 325,779 square kilometres.

Protected areas damaged by military activity

Protected areas are not immune from the impact of liberation wars, political turbulence and civil strife. In recent years, a number of protected areas around the world have been the scene of military disturbances. As a result of the Gulf conflict, two of Kuwait's proposed nature conservation areas, Al-Khian Desert Park in the west and Jal al Zhor National Park along the escarpment on the north side of Kuwait Bay, have been seriously disturbed. Other recent examples include Manas Sanctuary in India, Plitvice Lakes National Park in Yugoslavia, Wilpattu National Park in Sri Lanka, Simen National Park in Ethiopia, and the magnificent parks systems of Mozambique and Angola, which have been totally destroyed. From: *IUCN Bulletin*, September 1991.

Map of Plitvice Lakes, a World Heritage Site, the most famous of the Yugoslav National Parks and formerly visited by nearly one million people each year.

Europe and USSR

Further news from Yugoslavia

Reports continue to be received from individuals and organisations which highlight the damage to several areas of international importance. Much has been said of the ecological damage to Plitvice National Park, a World Heritage Site (see last issue). Over a dozen other sites have been identified as being threatened, including three important bird areas in urgent need of conservation action (the alluvial wetlands of the Sava River, Krka National Park and Neretva Delta – a specially protected area under the Barcelona Convention). Troops have reportedly shot red deer, wild boar and other game in Kopacki Rit Nature Park. A number of unprotected habitats are reported to have been damaged including saltpans, forests and fishponds. The Sava River has been polluted by oil following damage to the Sisak petroleum refinery, and tracts of coastal forest (maquis, garigue and coniferous forests) have been set alight or are threatened by burning. From: IUCN East European Programme; WCMC.

New parks for Nigeria

Six new national parks have been designated in Nigeria: Cross River, Chad Basin, Gashaka Gumti, Kainji Lake and Old Oyo in August 1991 and Yankari subsequently. Cross River National Park is contiguous with Korup National Park in neighbouring Cameroon. They include important centres of biological diversity, richer in species than many other moist equatorial forests in the world. *From: Federal Republic of Nigeria Official Gazette*, 26 August 1991; *WWF Features*, August 1991.

The first national park in Byelorussia

The Byelorussia Council of Ministers created the Byelovezhskaya Pushcha State National Park on 16 September 1991. The park covers all the eastern section of the well-known Bialowieza Primeval Forest; an area of 87,600 ha. It was a zapovednik (IUCN Category I strict nature reserve) during the post war period until becoming a State Game and Nature Protection Management area in 1957, to provide a hunting ground for influential people ('prominents'). A core zone of about 15,000 ha is planned for the park, with a partially protected zone, zone for intensive tourism as well as a buffer zone. Creation of this park has produced a transfrontier protected area including both the Polish and the Byelorussian sections of the Bialowieza Forest, which may be a potential biosphere reserve. There has been close cooperation between the authorities from the Byelorussian part of the forest and the Polish Bialowieza National Park since 1921. *From:* Bialowieza National Park, Poland, November 1991.

Sub-saharan Africa

Protected areas for Equatorial Guinea

The first protected areas in Equatorial Guinea have recently been notified. A system of national parks and reserves was established by the colonial Spanish administration, but was never officially recognised following independence in 1968. The new protected areas are the island of Annobon, two sites on the island of Bioko, and six on the mainland, Mbini. *From: Elephant Conservation Plan Equatorial Guinea* October 1991.

Mining threatens West African World Heritage Site

Open cast iron ore mining is planned for the heart of the Mount Nimba Range in Guinea. The area affected is within a World Heritage site – also a Biosphere Reserve and first identified for protected area status in 1944. An independent environmental impact assessment of the proposal has been commissioned by the World Bank, but this will not be completed before the end of 1993. The consortium (Nimba International Mining Company) wants to begin open cast mining as soon as possible and will not wait for the results. It is apparent that the proposals are a serious threat to the site and incompatible with heritage classification. Mining will drive off all large animals, including chimpanzees, leopards, pygmy hippopotami and the very rare lesser otter shrew. Polluted run off will also threaten rainforest and lowland rice-growing areas below the range. *From: New Scientist*, 30 November 1991.

Plans for tri-national conservation area in Southern Africa

The governments of Mozambique and South Africa are discussing the creation of a vast conservation area in central Mozambique, which would incorporate the existing Bahine and Zinave national parks and link them with South Africa's Kruger National Park and Zimbabwe's Gonarezhou National Park. The combined area of this cross-border park would be some 11.4 million hectares. Much of the area has been ravaged by war and many of the former occupants of the land have left the area, which has consequently undergone some degree of ecological recovery although poaching remains a major problem. The proposals have been drawn up

at Pretoria University, with funding from the South African Nature Foundation, and the World Bank is considering a US$12 million loan to Mozambique to start the scheme. Concern has been expressed that this initiative could shift the focus of international safari tourism towards Southern Africa, and that the park will be dominated commercially by South Africa. It has also been pointed out that South Africa has a poor track record of involving local people in park management. A second cross-border park is included in the proposals, linking the parks of northern Natal with Maputo elephant park and other areas in southern Mozambique. From: *The Guardian*, 8 November, 1991.

Richtersveld National Park – at last

Good news from the Republic of South Africa. After an 18-year struggle to establish a large conservation area in the mountainous desert of the Richtersveld, an agreement was signed in July 1991 between the National Parks Board and the local community to proclaim the first contractual national park. After many years of exploitation, it has been recognised that a multi-faceted conservation initiative is the only option which will ensure a better quality of life for the local people. Representatives of local communities will participate in making decisions on how best to manage natural resources and maximise their benefits from these resources. The proclamation of this National Park has established another cross-border conservation opportunity, for Namibia proclaimed the 3,000 km² Fish River Game Reserve bordering the Richtersveld in 1986. From: National Parks Board, South Africa August 1991.

Halt to road construction in Kahuzi-Biega National Park

German cooperation in the construction of the final section of the Kisangani Bukavu road, which threatens the integrity of Kahuzi-Biega National Park, has been withheld. In colonial times the 637km road connected the rich Kivu region in the east with population centres in the west. Since 1982, the road has been reconstructed with support from the EC, The African Development Bank and the Government of the Federal Republic. The German Minister for Economic Cooperation has declared that a long-term solution to protecting this World Heritage site must be found. From: *Bundesminister für wirtschaftliche Zusammenarbeit, Mitteilung für die Presse* September 1991.

Indo-Malaya

Siberut Biosphere Reserve threatened

On the unique island of Siberut, a Biosphere Reserve since 1981, 15% of the plants and 65% of the animal species are endemic. Although the Indonesian environment ministry wishes to take all possible steps to preserve the fauna and flora, other ministries have conflicting priorities. Three quarters of the island is leased to logging companies and other areas are being cleared for oil palm plantations. There are plans to resettle the 18,000 indigenous people, who are resisting the loggers, to government-planned villages away from their traditional forest territories. Some 40,000 people are to be moved to the island in 1992 as part of the Indonesian transmigration programme. From: *New Scientist, No. 1793, 2 November 1991.*

An Indonesian transmigration settlement with oil palm plantations in the background.
Photo: Paul Goriup.

Doi Suthep-Pui: northern Thailand's most famous park under threat

Situated near Chiang Mai, Thailand's second city, the well-known national park of Doi Suthep-Pui is under severe threat. It is proposed to build a large leisure centre on its lower slopes and to widen and extend the main road into the park into a four-lane highway. Hunting is a major problem – all large mammals have been wiped out, including bears, wild boars and gibbons. At least ten species of birds have also disappeared, while collection of butterflies and orchids is a further problem. Some of these problems were addressed at a recent seminar in Chiang Mai University, organised by a community group called Chom Rom Phua Chiang Mai, in collaboration with the Provincial Authority, Royal Forest Department and the Association of Non-governmental organisations. A major failing is a lack of understanding of the park's role by the local community, and a lack of community involvement in its management. The main outcome of the seminar was the need to set up a restoration project for Doi Suthep. Objectives would be to prevent further forest destruction, restore areas already degraded and find ways to reduce the impact of mass tourism. Such problems are typical of quite a large number of Thailand's protected areas, with little effective protection afforded to many of its national parks. *From: WWF Features*, July, 1991.

Kalimantan forests burn

Huge fires began burning in southwest Borneo in about mid August. One estimate suggests that at least 6,000km^2 of rainforest had been destroyed by mid September and the Indonesian environment ministry predicts that some 10,000km^2 could be lost before the rains come. However, the last serious fires in far eastern Kalimantan in 1982-83 destroyed at least 35,000km^2 before being put out by rain. Concern is being voiced that the current drought could worsen the effects of these latest fires, the smoke from which is affecting visibility as far away as Singapore and Kuala Lumpur. Fires have since been reported in Sumatra, western Java and southern Sulawesi. *From: BBC Wildlife*, November and December 1991.

Irrigation project threatens park complex in Sri Lanka

Proposals to augment the water resources of the Kirindi Oya for irrigation purposes in the south-east of Sri Lanka include the construction of a concrete weir on the Menik Ganga, next to Ruhuna (Yala) National Park, and a 17.5km canal which will bisect the proposed Lunugamvihira National Park. Wildlife from Ruhuna would have to cross the canal and its associated road to reach Uda Walawe National Park to the west – in reality any such movement would be extremely limited. The inevitable settlement along the banks of the canal would result in increased human contact with wildlife and clearance of large tracts of forest for cultivation, as happened previously along a smaller road in Uda Walawe National Park. Apart from the loss of forest communities, this development would lead to fragmentation of one of the largest protected area complexes in the country. *From: Daily News (Colombo)*, October 19, 1991.

Kirthar national park saved

The Ministry of Communications and the Indus Highway Board proposal to build a highway through Pakistan's largest national park (see last issue) has been cancelled following direct intervention by the Prime Minister, Nawaz Sharif. Criticism from a wide range of

Kirthar National Park, the largest in Pakistan, saved from highway construction.
Photo: Paul Goriup.

national and international conservation groups was overruled with the issue of a No Objection Certificate by the Sind Chief Secretary. This led the Society for the Conservation of the Environment to move a constitutional petition in the Sind High Court to cancel the NOC, but the personal intervention of the Prime Minister has saved the situation. *From: Natura*, Summer, 1991.

North America

Judgement day for the spotted owl and its forests

The US Department of the Interior has called together a high-level committee to decide whether America should afford to save an endangered species from extinction, by upholding restrictions on logging in West Coast forest where the last spotted owls live. The Bureau of Land Management wants to open up an additional 1600ha of federally-owned forest in Oregon, Washington and California for commercial logging. The Fish and Wildlife Service, while approving many other logging requests in the same area, has blocked these applications because of the northern spotted owl *Strix occidentalis caurina*. The committee has six months to make a decision. *New Scientist*, 12 October 1991.

Good news for America's "Serengeti"

In a graphic demonstration of the political clout of the environmental movement, the US Senate moved to veto a comprehensive energy bill, whose most notorious provision would have opened up Alaska's Arctic National Wildlife Refuge to oil exploration. The bill was universally condemned by environmentalists for its emphasis on increased domestic oil production and on taxpayer subsidies for nuclear power and coal, while virtually ignoring renewable energy resources and conservation needs. The focal point of the opposition was the proposed exploitation of the wildlife-rich Arctic Refuge, often referred to as "America's Serengeti". At least eight pro-environment senators had promised to stop the bill with a filibuster –an endless debate– specifically in order to prevent drilling in the Arctic Refuge. From: *Sierra Club National News Report*, 11 November 1991.

Central America and the Caribbean

Road threatens US rain forest

Environmentalists are trying to stop a proposal to reopen a road that cuts through the heart of the only tropical rain forest in the US National Forest system. The proposal calls for the reopening of Puerto Rico's Highway 191 in the El Yunque rain forest. Environmentalists contend that reopening the highway could also directly threaten the recovery of one of the

The northern spotted owl

world's most endangered birds, the Puerto Rican parrot. Source: *Sierra Club National News Report*, 11 November 1991.

Golden Toads missing in Costa Rica

It is now three years since the last golden toads *Bufo periglenes* were seen in the Monteverde Cloud Forest Reserve, where they are endemic. There is no obvious local cause for their disappearance and it is feared that a drought in 1986-87, caused by the El Niño current oscillation and changing rainfall patterns in the region may have caused their extinction. *From: BBC Wildlife*, June 1991.

South America

Vast tract of Yanomami land protected in Brazil

President Ferdando Collor has signed a decree ratifying the demarcation of 9.4 million hectares of Yanomami land (an area over twice the size of Switzerland), replacing earlier decrees of 1989 under which 19 Yanomami areas were established. The area is adjacent to the Venezuelan Orinoco-Casiquiare Biosphere Reserve (see PARKS 2/3). This land will be placed off-limits to outsiders in an attempt to protect the Indians, minimising their contact with non-Indian populations. The earlier decrees were criticised for fragmenting Yanomami land and allowing mining operations in other Yanomami areas. The Brazilian government plans to use this as a model in dealing with Indian lands. President Collor has also signed a decree ratifying the demarcation of lands in five reservations in the south, covering 35,800ha of land occupied by the Kaingangue and Gurarani Indians. From: *Brasil Environment*, 5 May 1991; World Conservation Monitoring Centre.

... But opposition to the Yanomami Park is increasing

Certain political, commercial and military interests in Brazil are opposing creation of the Park because of the restrictions it will place on development in Roraima and Amazonas States, the great economic value of mining concessions there and fears that control of the area might eventually pass out of the hands of the country. A proposal for a 6,929km Transfrontier Road to encircle the Amazon region would pass through this area and 21 other national parks, reserves and indigenous areas, with potentially very damaging effects on both habitats and inhabitants. *From: BBC Wildlife*, December 1991.

Major expansion to Kaieteur National Park

The Government of Guyana has recently confirmed its commitment to extend Kaieteur National Park to some 400,000ha, 34 times its original size. A system of zonation has been proposed for the park and it is planned to involve residents in its management. A multinational team will spend four to six weeks collecting biological and sociological data in order to develop a detailed strategy for its long-term management. Excessive use of mercury by gold-miners, who have been dredging in the Potaro River upstream of the Kaieteur Falls, may soon pose serious health risks. WWF-USA is involved in a major fund-raising programme to support the park's establishment. From: World Conservation Monitoring Centre.

Argentina modifies its protected areas system

Argentina is currently reviewing its National System of Natural Protected Areas. Proposals include standardising the nomenclature of management categories used by provincial and national governments, and a new national parks law to clarify protected area designations and to coordinate the activities of the many administrative organisations. The national parks administration (APN) will include representatives from all provincial administrations. Two new national parks have been proposed and are currently being incorporated into the national network. They are Parque Nacionale Los Cardones (70,620ha) in the Province of Salta, and Parque Nacionale Sierra de los Quinjadas (150,000ha) in the Province of San Unis. From: *El sistema Nacional de Areas Naturales Protegidas de la Republica Argentina*, Administration de Parques Nacionales (APN), August 1991.

Compiled by the WCMC Protected Areas Data Unit. Items for inclusion (or newsletters and reports from which such items can be extracted) should be sent to: Protected Areas Data Unit, World Conservation Monitoring Centre, 219c Huntingdon Road, Cambridge CB3 0DL, United Kingdom.

The lowland tapir is an important source of food for subsistence hunters in tropical South America, but careful management is required to ensure that they are not over-exploited by commercial hunters. Photo: J. Penn

DIARY

1992

10-21 February — The IVth World Congress on National Parks and Protected Areas, Caracas, Venezuela. *Contact: Jeffrey McNeely, IUCN, 1196 Gland, Switzerland.* Tel. (22) 649114; Fax. (22) 642926.

12-14 February — Ente Colombo '92: Mediterranean and Caribbean Countries for the Preservation of their Seas. *Contact Prof. Giuliano Fierro, Ente Colombo '92, Via Sottoropia 5, Palazzo Serra Gerace, Genoa, Italy.* Tel. (10) 284111; Fax. (10) 292693.

26-28 February — International Conference on World Forests. Progress on Sustainable Development, Badung, West Java. *Contact Dr Nani Djuangsih, Institute of Ecology, Padjadjaran University, Jl Sekeloa, Bandung, Indonesia. Fax. (62) 22 433208.*

1-12 June — United Nations Conference on Environment and Development, Rio de Janeiro, Brazil. *Contact: UNCED Secretariat, PO Box 80, 1231 Conches, Geneva, Switzerland.* Tel. (41-22) 789-1676; Fax. (41-22) 789-3536.

17-19 June — Systematics and Conservation Evaluation, London, U.K. *Contact: Peter Forey, The Natural History Museum, Cromwell Road, London, SW7 5BD, U.K.* Tel. 71938-9123.

13-17 July — Biodiversity in Managed Landscapes - Theory and Practice, Sacramento, California, USA. *Contact: Robert Szaro, Forest Environment Research, USDA Forest Service, P.O. Box 96090, Washington, D.C. 20090, USA.*

27-31 July — Parks, People and Snow Leopards. The Seventh International Snow Leopard Symposium, Xining, Qinghai Province, People's Republic of China. *Contact: Helen Freeman, International Snow Leopard Trust, 4649 Sunnyside Avenue North, Seattle, WA 98104, USA.*

13-17 September — INTECOL'S IV International Wetlands Conference, Columbus, Ohio, USA. *Contact: William J. Mitsch, School of Natural Resources, 2021 Coffey Road, Ohio State University, Columbus, Ohio 43210, USA.* Fax. (1-614) 292-7162.

16-20 November — Partners in Stewardship. The George Wright Society's 7th Conference on research and resource management in parks and public lands. Jacksonville, Florida. *Contact The George Wright Society, P.O. Box 65, Hancock, Michigan 49930-0065, USA.* Fax. (1-906) 487-9405.

1993

September 1993 — 5th World Wilderness Congress. Norway. *Contact: The Wild Foundation, 211 W. Magnolia, Fort Collins, CO 80521 USA.* Tel: (303) 498 0303 Fax: (303) 498 0403.

RESUMOS

A ocupação humana dos parques da América do Sul – Um problema fundamental
Stephen e Thora Amend
Cerca de 86% dos parques nacionais da América do Sul têm de enfrentar o problema dos grupos de população temporária ou permanente no seu interior. Muitos países declararam os seus parques como "áreas de uso público" no espirito da convenção de Washington implicando o direito (e até a obrigação) do Estado expropriar os habitantes que vivem no interior do parque nacional. Porém, na maioria dos casos os governos não estão em posição de aplicar a política consequente em virtude de razões sociais, financeiras ou pessoais. Como resultado há duas alternativas para o futuro dos parques nacionais na América do Sul: Efectuar uma deslocação a curto prazo dos estabelecimentos humanos por razões ecológicas, com o consentimento das pessoas afectadas; ou ao mesmo tempo iniciar a tarefa contínua de educação ambiental e sensibilização procurando alternativas para a criação de riqueza que reduzam a pressão sobre os recursos naturais.

A evolução dos sistemas das áreas protegidas naturais: uma metodologia numérica
Carlos Rivero Blanco e Mario Gabaldón
Um dos problemas que os gestores das áreas naturais enfrentam é a dificuldade de distinguir o grau de intervenção nas áreas e o estabelecimento de prioridades na aplicação de acções correctivas para resolver os problemas críticos ou para garantir protecção efectiva. O Serviço Nacional de Parques da Venezuela desenvolveu a metodologia descrita com o objectivo de estabelecer prioridades de gestão e orientou-a para os parques considerados como mais importantes.

Esforços comuns para a conservação do refúgio de vida selvagem do Cuare
Cecilia de Blohm
O desenvolvimento sócio-económico das populações está intimamente ligado à conservação dos recursos naturais dos quais dependemos para a nossa sobrevivência. Um dos desafios dos anos 90 é a capacidade para conciliar conservação e desenvolvimento num processo dinâmico cada vez mais complexo e que requer o apoio de todos os sectores da sociedade. Por exemplo, a experiência acumulada na preparação do plano de gestão do refúgio de vida selvagem do Cuare é o resultado de esforços conjuntos de uma organização não governamental – FUDENA – e o Governo (Ministério do Ambiente e dos Recursos Naturais Renováveis) através do Servicio Autónomo para la Proteccion, Restauracion, Fomento y Racional Aprovechamiento de la Fauna Silvestre y Acuática del País.

As zonas tampão nos trópicos americanos—propostas para o aumento da influência da área protegida
Alejandro C. Imbach e Juan Carlos Godoy
O papel das áreas protegidas nas regiões tropicais está estreitamente ligado à sua função de conservação da biodiversidade, com a função de suporte dos processos ecológicos essenciais e também com a contribuição para o desenvolvimento sustentado que a região requer. A administração das áreas protegidas dos trópicos americanos tem sido dificultada por uma série de factores externos tais como: insurreição, exploração de petróleo, construção de estradas ou barragens, extracção de madeira ou expansão das áreas agricultadas bem como problemas de gestão interna. A experiência de gestão para a produção dos solos tropicais mostra que sistemas adequados para áreas temperadas ou frias não são aplicáveis para os trópicos.

Expansão do sistema de área de conservação na Amazonia-Brasil
Maria Teresa Jorge Padua
Existem vários documentos e várias recomendações propondo que a extensão de áreas demarcadas na Bacia Amazonica seja incrementada. Muito poucos, se alguns, levão em consideração o que isso significaria em termos financeiros para países em desenvolvimento. Em estudo recentemente realizado pela Fundação Brasileira para Conservação da Natureza (FUNATURA), Secretaria da Ciência e Tecnologia (SCT) e Programa de Desenvolvimento pela Nações Unidas (PDNU) entitulado *O Custo da Implementação de Areas de Conservação na Amazonia Legal* verifica o custo da extensão e estabelecimento de um sistema de uso direto e indereto dos recursos naturais equivalente a 30% da região.

Areas protegidas costeiras e marinhas nas Caraíbas: como é que podemos fazê-las funcionar!
Tom van't Hof
Há perto de 135 áreas protegidas marinhas e costeiras legalmente estabelecidas na zona das Caraibas. Porém, cerca de 75% delas não são realmente protegidas porque não têm uma gestão eficaz. A análise económica destas áreas protegidas, o maior envolvimento das NGOs na sua gestão e a criação de receitas por e para estas áreas protegidas são necessários para melhorar o seu funcionamento. Isto criaria maiores oportunidades de investimento para as organizações financiadoras.

Rede de cooperação técnica para áreas protegidas na América Latina
Kyran D. Thelen
Foram estabelecidas por todos os países da América Latina sistemas de áreas protegidas para vida selvagem, e a sua gestão é agora vista como um uso importante e legítimo. No entanto, os avanços na gestão de áreas protegidas não têm sido semelhantes em todos os países da região, e até recentemente a colaboração na procura de soluções para os problemas comuns tem sido mínima entre as instituições e os especialistas responsáveis. O artigo examina um mecanismo que foi estabelecido na região da América Latina para promover a cooperação na troca de informação, experiências e conhecimento e para procurar soluções para os problemas técnicos comuns que surgem no desenvolvimento das áreas protegidas para a vida selvagem.

RESUMES

Occupation Humaine dans les Parcs Nationaux d'Amérique du Sud: Un Problème Fondamental
Stephan et Thora Amend

Environ 86% des parcs nationaux d'Amérique du Sud se trouvent confrontés au problème de la colonisation permanente ou temporaire à l'intérieur de leurs limites. De nombreux pays ont désigné leurs parcs nationaux comme des aires "d'utilité publique" dans l'esprit de la Convention de Washington (1940) et ceci implique le droit (et même le devoir) de l'Etat de déplacer les habitants qui se trouvent à l'intérieur d'un parc national. Cependant, dans la majorité des cas, les gouvernements ne sont pas en mesure d'appliquer une telle politique pour des raisons sociales, financières ou personnelles. En conséquence, deux choix s'offrent pour l'avenir des parcs nationaux: effectuer un déplacement à court terme des colons pour des raisons écologiques, et ceci avec l'assentiment des personnes concernées, ou bien instaurer un programme continu d'éducation environnementale et de sensibilisation, en recherchant d'autres sources de revenus qui réduiront les pressions exercées sur les ressources naturelles.

L'Evaluation des Systèmes d'Aires Naturelles Protégées: Une Méthode Numérique
Carlos Rivero Blanco et Mario Gabaldon

L'un des problèmes se posant aux gestionnaires des aires naturelles protégées est la difficulté à identifier le degré d'intervention dans ces aires et à déterminer les priorités pour la mise en oeuvre de mesures correctives afin de résoudre les problèmes critiques ou de garantir une protection efficace. Le Service des Parcs Nationaux du Venezuela a développé une méthode ayant pour objectif l'établissement des priorités de gestion et son application dans les parcs considérés comme les plus importants.

Efforts Communs pour la Conservation du Sanctuaire de Vie Sauvage de Cuare, Venezuela
Cecilia de Blohm

Le développement socio-économique des populations a un rapport très étroit avec la conservation des ressources naturelles sur lesquelles nous dépendons pour notre survie. L'un des défis des années quatre-vingt-dix sera de réconcilier les liens entre conservation et développement dans un processus dynamique qui est de plus en plus complexe et qui nécessite l'assistance de tous les secteurs de la société. L'expérience accumulée lors de la préparation du plan de gestion du Sanctuaire de Vie Sauvage de Cuare fournit un exemple d'une telle coopération, résultant d'un effort commun entre une organisation non gouvernementale (FUDENA) et d'un organisme gouvernemental, le Service National Autonome pour la Protection, la Restauration, la Promotion et l'Utilisation Rationnelle des Faunes Sauvage et Aquatique (lié au Ministère de l'Environnement et des Ressources Naturelles Renouvelables).

Progrès dans la Gestion des Zones Tampon dans les Régions Tropicales Américaines: Projets pour Augmenter l'Influence des Aires Protégées
Alejandro C Imbach et Juan Carlos Godoy

Le rôle des aires protégées dans la région tropicale est étroitement lié à leur rôle de conservation de la diversité biologique qui est à la base du maintien des principaux processus écologiques et qui contribue au développement durable de la région concernée. L'administration des aires protégées des zones tropicales américaines est entravée par un nombre de menaces externes comme les insurrections, l'exploitation pétrolière, la construction de routes et de barrages, les coupes de bois et l'extension des terrains agricoles, ainsi que par les problèmes de gestion internes. L'expérience de la gestion productive des terres tropicales a montré que les systèmes de gestion développés pour les régions tempérées et froides ne sont pas appropriés aux régions tropicales.

Expansion du Réseau d'Aires de Conservation dans l'Amazonie Brésilienne
Maria Teresa Jorge Padua

Il existe plusieurs documents et recommandations proposant une augmentation de la superficie des aires protégées dans les régions du Bassin de l'Amazone. Aucun de ces documents n'a peut-être évalué quantitativement ce que celà signifie, en termes financiers, pour ces régions en voie de développement. Une étude récente réalisée au Brésil par FUNATURA, SCT et UNDP, intitulée *Cost of Implementing Conservation Areas in Legal Amazonia* fixe le coût de l'extension et de l'établissement d'un système d'utilisation directe et indirecte des ressources naturelles qui représenterait 30% de la région.

Aires Protégées Côtières et Marines des Caraïbes: Comment Assurer Leur Bonne Marche?
Tom van't Hof

Il existe environ 135 aires protégées côtières et marines officielles dans l'ensemble des Caraïbes. Environ 75% de ces dernières ne sont cependant pas réellement protégées en raison de l'absence de toute gestion efficace. Des analyses économiques de ces aires protégées, une plus grande participation à leur gestion des organisations bénévoles et la création de revenus par, et pour, ces zones protégées sont nécessaires si l'on veut améliorer leur rôle. Ceci offrirait des possibilités d'investissements considérables aux organismes de financement.

Un Réseau de Coopération Technique pour les Aires Protégées d'Amérique Latine
Kyran D Thelen

Des réseaux d'aires sauvages protégées ont été établis par tous les pays d'Amérique latine et leur gestion est maintenant considérée comme un mode important et légitime d'exploitation des terres. Les progés réalisés dans la gestion des aires protégées n'ont cependant pas été comparables dans tous les pays de cette région et, jusqu'à ces derniers temps, la collaboration des organismes responsables et des experts pour la recherche de solutions aux problèmes communs a été minimale. Cette étude examine un système mis en oeuvre en Amérique latine afin de promouvoir la coopération entre les pays au niveau de l'échange des informations, des expériences et des connaissances et afin de rechercher les solutions aux problèmes techniques communs qui se posent lors du développement des aires sauvages protégées.

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