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Editors: Stephan and Thora Amend
National Parks without people?
The South American experience

Stephan & Thora Amend editors
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The Editors
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The relationship between protected natural areas (especially national parks) and local human populations is extremely complex. In protected areas all over the world, numerous conflicts and difficulties have arisen from this relationship. In the South American Region, this topic has often been treated inappropriately, from varied and contradictory perspectives, but all negative toward both the protected areas and the human populations that are linked to them.

One extreme has been to systematically close one's eyes to reality and refuse to recognize the fact that a large number of the national parks are not spaces without inhabitants. This has caused a sort of schizophrenic behavior in many officials: formally enforcing the laws and regulations, maintaining publicly that human populations do not, or should not, exist within the protected natural areas; while they know that reality is different. Since the presence of these populations is not publicly recognized, no effort is made to study and understand the situation, nor to propose solutions that may benefit the local people, while assuring the long-term conservation of the protected areas. And so the problem continues to get worse; the local people distance themselves from the park authorities and the possibility of conflict grows: clear policies are not arrived at and no one really knows what to do.

The other extreme (which possibly arose in reaction to the above situation) openly questions the validity of the concept of national parks and protected natural areas in general, within the Region. The accusation is made that this is a concept "from the North" that is unfair and damaging to the people who live where parks are established. The claim is made that protected natural areas increase the poverty and underdevelopment of these people, by not permitting them to use their resources. As absurd as this idea may seem to those that know something of the importance of protected natural areas to integrated sustainable development and to national or global strategies for conservation and development, many people believe it, due to naiveté or lack of understanding. Others use this idea to defend their own vested interests.

Obviously, the positive and correct focus on this issue follows neither of these paths. In the first place, it should start by recognizing the true situation of the protected areas, taking into account the positive and negative experiences of previous attempts to reconcile the needs of conservation with the needs of the local people. In this way, policies and strategies may be defined in each country which will allow the secure and firm development of national systems of protected natural areas, in which local populations are allies and beneficiaries, along with the rest of the country.
Fortunately, although not widely publicized, the national park administrations of South America, together with diverse conservation organizations, have been working arduously toward the resolution of these conflicts between populations and parks (which are sometimes more theoretical than real). The results of these efforts show that, with good will and conceptual clarity, it is possible to find harmonious solutions to many of the problems. On the other hand, it is also true that certain laws and regulations should be modified to facilitate more participative processes, which in practice are already taking place and contributing to the development of long-term solutions.

"National Parks without People?" constitutes a first great step of regional importance, along the trail of collecting experiences and deeply analyzing the positive and negative inter-relationships between protected areas (in this case, national parks) and local people. The editors have achieved the ample participation of specialists from throughout the Region, who through this book can transmit their experiences and points of view, in a very direct and positive way. All of those who have contributed in one way or another to this work can feel proud, because it forms a basis for the orientation of actions to be taken on this issue during the coming years, in the same way that the Spanish edition of this book is already being used in distinct national parks throughout South America.

The promoters and editors, the Amends, should be congratulated, along with all the authors, who through their excellent chapters illustrate and open the doors to increasingly better management of protected natural areas.

This book should be required reading for everyone interested in protected natural areas, due to its conceptual richness and the wealth of information it contains on the inter-relationships between human populations and the national parks of the Region.

Gustavo Suárez de Freitas
South American Vice-chairman
Commission on National Parks and other Protected Areas (CNPPA)
IUCN - The World Conservation Union

Lima, January 1995
The first national parks in South America were created early this century. Since the 1970s and 1980s there has been a considerable increase in the creation of protected areas, as well as a growing public awareness of environmental issues, due mainly to alarming reports of the destruction of unique natural areas and irreversible extinction of flora and fauna species. Today (1992) there are 184 national parks in South America.

The national park concept was applied for the first time in 1872 with the creation of Yellowstone in the United States of America. The idea of conserving natural areas for future generations is as current today as it was a hundred years ago. To achieve this goal, however, there must be a constant review of concepts and methods to adapt them to local circumstances and social conditions, devoting special attention to two groups of people that could cause serious problems and had already been identified in the Yellowstone Manifest: park inhabitants and tourists.

The “Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere” (Washington Convention) was drawn up in 1940. With the ratification of this international treaty, the member countries undertook to examine the possibilities of creating protected areas in their respective territories. At the same time, and through this convention, it was proposed to unify the terminology and objectives of the various categories of protected natural areas. It was thus agreed to reserve the term ‘national park’ for “regions established for the protection and preservation of superlative scenery, flora and fauna of national significance, which the general public may enjoy and from which it may benefit when placed under public control.”

The Washington Convention, which was signed by all South American countries except Guyana and French Guiana, has had a decisive influence on national legislation. Moreover, in harmony with the spirit of the Convention, many countries designated their national parks as areas “for public or social utility”, thus creating the right (and even the obligation) of the State to expropriate within the area of the national park in the same way as when undertaking infrastructural projects, such as the construction of dams or highways. As a result, the change in the legal status of an area that is declared a national park means for the inhabitants of the area, that they must live in constant fear of being relocated whenever the local authorities see fit to do so. Most managers recognize the problems inherent to human settlements in the parks, but these conflicts are usually seen from a conceptual and not a practical standpoint, with no apparent solution.

This study documents the status quo of national parks in South America, showing achievements and failures in the management of this protected area category,
undoubtedly the most important and most widely recognized in the subcontinent. The title “National Parks Without People? The South American Experience” is intended to encourage the posing of many questions, such as:

- Was the Yellowstone idea of conserving undisturbed natural spaces for future generations utopian, or is this idea also feasible in South America?
- It is justifiable to impose such an ambitious environmental conservation program on a region plagued with serious social and economic problems?
- On the other hand, is it not more important, in the long term, to conserve genetic and landscape samples, in many cases unique and non-renewable, for the future, although this might cause problems to a few persons affected?
- After all, is it necessary to see Man as an adversary to national parks?
- And, finally, what course will national parks and environmental policy take in South American countries in the coming millennium?

Some of the many possible answers to these and other questions will be discussed in this volume. To facilitate access to information, the articles have been organized by country. The chapter on each country opens with an introduction to its protected area system and nature protection policy, usually followed by an analysis of the legal aspects of human occupation and the use of natural resources in the national parks. The chapters on each country conclude with a description of management experiences in selected protected areas, very concrete in nature and with practical detail. The final chapter (balance sheet) aims at providing an integral analysis of the problem, by giving a regional panorama of the status of national parks in South America.

The authors of the papers presented in this volume have many years experience in the field of conservation and occupy significant posts in both government and non-government organizations. For most of them, it has been both an inspiring and challenging experience to deal with an issue so explosive, so controversial, and at the same time so decisive for the future as the relationship between Man and Nature. This problem is reflected on a small scale in the relationship between national parks and local populations. In dealing with this subject, each author developed a highly individual viewpoint, stemming from the political, cultural, social, economic, and geographical circumstances influencing his daily work. A multitude of aspects thus arise, including contrary opinions, that will be relevant for those interested in the conservation of Nature and the management of protected areas.

With this book, the editors hope to contribute to many lively discussions and exchanges of opinion among professionals, politicians and the general public interested in this subject, both inside and outside the region.

Caracas, January 1992

Stephan and Thora Amend
Editors
Introduction to the English edition

When the idea for the project "Inhabitants in South American National Parks" was born in 1989, it was nourished by two main thoughts: first, to analyze the regional situation of national parks in relation to local populations, and, second, to produce a document that would serve to initiate discussion at the IVth World Congress on Protected Areas (held in Caracas 1992) of this highly controversial topic, which has been considered almost taboo for many years. The project intended to raise awareness of the fact that, in the past, little attention had been paid to the needs and aspirations of the inhabitants of protected areas.

However, the situation in 1995 seems somewhat changed: while in the past discussions had always focused almost exclusively on Nature, recent developments seem to concentrate only on Man, forgetting that the real challenge for protected area managers lies in the integration of Nature and Man. It would be a tragic misunderstanding, if the necessary respect for local populations, the recognition of their justified claims, and the efforts to include them in the management, were to lead to a loss of the basic idea and main purpose of national parks: the conservation of unaltered natural areas for future generations.

Almost all the authors of the present book were able to personally attend the World Congress in Caracas. Their important contributions (many of which were based on the papers presented here) enriched the discussions and helped to make "people and protected areas" one of the major themes of the Congress.

Encouraged by many positive comments on the Spanish edition, and the wish expressed by several experts from other continents, to make the information contained therein available to people in their regions as well (in order to carry out similar studies and to show management alternatives for their protected areas), we started to tackle the translation in mid-1992. We would never have imagined, however, that this venture would take three entire years (due to the lack of financial support, other professional commitments, and a couple of 'extensions' to our family). Although we felt disillusioned at times about the very slow progress, we are now grateful for the delay between the two editions, because it compelled us to include 'editorial updates' for each chapter in the English version. By this, the dynamic developments in the region become very clear and illustrate well the increasing importance that South American governments assign to protected area management and to nature conservation in general.

Despite of all the changes that have taken place, we think that the original articles and their key messages have lost none of their significance. We ourselves
re-read them with interest and eager attention and, once more, discovered fascinating details that might help us in our daily management work with indigenous groups, small farmers, tour operators, the petroleum industry, and the reserve administration of the Cuyabeno Fauna Production Reserve, in Amazonian Ecuador.

Quito, March 1995

Stephan and Thora Amend
Editors
National parks are established to prevent the impact of humans on natural ecosystems. What could be more reasonable, or important in a time of growing human influence on nature?

But wait a minute. Perhaps we have missed something important, because people, too, are part of nature, and excluding them may bring about fundamental and unplanned changes in the habitats and ecosystems which we value the most, and perhaps even lead to the degradation of biodiversity. This sounds like a radical idea, but perhaps some examples from South America could help clarify the point.

Posey (1982) has argued that certain game species would not occur in forest unmodified by humans, and important game species of mammals such as deer, tapir and collared peccary reach much higher densities in modified areas. Further, while spending many years working among the Kayapo Indians of Amazonia, Posey found that they gathered dozens of plants - including several types of tubers, beans, and other food plants - as they moved through the forest, carried them back to the forest campsites or trails, and replanted them in natural forest clearings. Such “forest fields” are always located near streams, but even in the savanna, where patches of forest are scattered, areas where collected plants have been replanted form useful food depots for this community, and for wildlife. This age-old pattern has had profound effects on the distribution of plants in the forest and has been an essential contributor to the current biodiversity of Amazonia.

In fact, the well-known findings by Peters et al. (1989) that the fruits, nuts, and latex produced in part of the Amazonian rainforest near Iquitos in Peru was worth more than the timber produced on the same hectare may have been because the forest where the study was carried out was in fact an abandoned garden rather than a “virgin forest”.

It is clear that gardens planted by indigenous communities are very attractive to wildlife. Balee (1985) pointed out that Indians well understand that allowing game animals to enter a garden will decrease its harvest, but they still leave some gardens unfenced, compensating for the expected loss of garden produce by deliberate overplanting. This enables a higher carrying capacity for game animals. For example, Tukano women plant extra manioc to attract agoutis, Dasyprocta punctata, an edible rodent (Dufour, 1990).

Among the Ka’apor, nearly 15 percent of the meat captured comes from gardens, which constitute only 0.3 percent of the primary catchment area (Balee, 1985). Taking abandoned gardens into consideration, less than 2 percent of the
catchment area is under primary or secondary cultivation, yet nearly 37 percent of
the meat obtained came from that relatively small zone. Peccaries, agoutis, and
paca forage on manioc, yams, and sweet potatoes. Deer browse on manioc leaves
and on grasses and seeds along the edges of gardens. Monkeys raid gardens for
maize and fruits, such as bananas, cashews, papayas, and mangos. Thus some of the
wildlife of Amazonia, at least, has adapted to the presence of humans, and several
species may have actually increased their populations as a result of the crops
planted by people.

It is also clear that many indigenous groups have developed ways of harvesting
resources without depleting them. For example, ethnobotanists have recorded uses
for more than 1500 of Ecuador's lowland plant species, approximately half of the
species known (Bennett, 1992). The Shuar Indians use more than 90 percent of tree
species for various purposes, including for construction (77 percent of species),
food (26 percent), fuel (24 percent), and medicine (7 percent); yet none of these
species are in danger of extinction, and most are prospering (ibid.). In the Amazon,
aricultural techniques make it difficult to distinguish between cultivated and wild
species, nor is there a clear boundary between fields and fallows or between fallows
and forests.

Of course, people living in the forests always face resource limits, and as their
populations increase, they may well deplete populations of game. Methods which
have been reported to help people respond to game depletion include: population
control; relocating settlements; maintaining small settlements disbursed as widely as
possible; trekking to distant hunting areas; expanding the breadth of game taken,
especially the smaller species; and avoiding hunting threatened species. Balee
(1985) notes that these strategies are not mutually exclusive, and that the efficiency
of them will vary from one ecosystem to another.

Many South American societies developed highly adaptive behavioral rules for
survival, supported by a coherent belief system with a foundation of strongly moti-
vating values which make endurable the challenges of existence in an unpredictable
world. Reichel-Dolmatoff (1976) demonstrated that aboriginal cosmologies and
myth structures, together with the ritual behavior derived from them, reflect a set of
ecological principles. These constitute a system of social and economic rules that
have a highly adaptive value in the continuous struggle to maintain a balance
between the resources of the environment and the demands of society.

For example, the Tukano Indians in the north-west Amazon of Colombia
perceive their environment as man-made, transformed and structured by the exploi-
tative activities of their ancestors and given symbolic meaning by them. They
conceive the world as a system in which the amount of energy output is directly
related to the amount of input the system receives. Their ethnobiological knowledge
is a structured, disciplined knowledge based upon a long tradition of inquiry that is
learned as part of the intellectual equipment for biological and cultural survival.
Factual knowledge about biological reality is considered essential for survival
because people must bring themselves into conformity with nature if they want to exist as part of nature’s unity, and must fit their demands to nature’s availabilities. Their mythology tells of animal species which have become extinct or which were punished or degraded for not obeying certain prescribed rules of adaptive significance. Thus, gluttony, improvidence, aggressiveness, and all forms of over-indulgence are punished by the superior forces, to serve as examples not only to the animal community, but also to human society. Animals, then, are metaphors for survival, and the Tukano analyze animal behavior to discover an order in the physical world, a world-order to which human activities can then be adjusted (Reichel-Dolmatoff, 1976).

For the Tukano, the conservation of ecological balance is the ultimate desirable quality. Thus the relationship between people and their environment is built on a rational level, but also constitutes an emotional relationship in which individual animals and plants are treated with respect and caution. They are quite aware of the fact that a stable balance of input and output will be maintained only if a number of regulatory mechanisms are instituted and fully respected by all members of the society (ibid.). For example, when fish run to spawn, those present in one’s stretch of the river should not be eaten, nor are birds eggs ever collected for food, and the flesh of some reptiles is avoided during their breeding season. I have discussed this example at some length to demonstrate that people who have learned to live in the forest have adapted to limited resources, and many of them are excellent resource managers, under traditional conditions.

Of course, times are changing. The San Bias Kuna of Panama are often brought up as an ideal example of where indigenous people have been able to maintain the integrity of their culture despite increasing pressures from outside, but the Kuna are having a generation rift. “The elders view culture as a body of inherited knowledge that is renewed through each generation’s intimate contact with the reefs, estuaries, and jungles of the San Bias region; it is the sap of a living tree”, says Kleymeyer (1992). “The acculturated young view culture as a clue to what it means to be a ‘genuine’ Kuna, a solution to the riddle of self-identity posed by modernization. For them, the culture is the immense and inert hardwood that holds a tree upright in a gale”. It remains to be seen how long the Kuna, and people like them, will be able to hold on to their culture, but it is clear that their environment is a crucial component of their lives.

The examples quoted above show that at least some indigenous groups possess cultural adaptations that result in preservation of the resource base. But some argue that these documented patterns of behavior may be sustainable only under conditions of low population density, abundant land, and limited involvement with a market economy. How relevant are such methods and customs to situations where these three conditions no longer exist?

Techniques developed to satisfy subsistence needs may not work when surpluses are needed for cash. As Redford (1990) points out, to believe that when confronted
with market pressures, higher population densities, and increased opportunities most indigenous peoples will maintain the integrity of their traditional methods is not only to argue against the available evidence, but worse, to fall into the ideological trap that produced the “ecologically noble savage”.

While people living in the forests, savannas, and mountains of South America area no more “noble” than people living in other parts of the world, they often share an understanding that protection of biological resources is part of an effective human adaptation to the environment, even as they are developing a new culture to adapt to modern conditions.

The Coordinating Body of the Indigenous Peoples’ Organizations, COICA, founded in 1984 to help coordinate the activities of organizations in Peru, Bolivia, Ecuador, Brazil, and Colombia representing 1.2 million Indians, has called on the environmental community “to recognize that the most effective defense of the Amazonian biosphere is the recognition of our ownership rights over our own territories and the promotion of our models for living within that biosphere”. Other groups are also recognizing the value of conservation. For example, several rural villages in the department of Loreto, in northeast Peru, have sought to establish local control over access to natural resources by setting up communal reserves. Most of Loreto’s villages have heterogeneous populations of detribalized Indians and Mestizos, called ribereños (people of the river banks). The communal reserves of ribereño villages currently have no legal status, but are regulated by written communal rules and are actively guarded by community members. Neither the existing markets nor the lack of firm land or resource tenure for ribereños communal reserves encourages sustainable management of forest resources, but the establishment of communal reserves is considered a useful step toward improving management (Pinedo-Vásquez et al., 1990).

The communal reserve movement has now been recognized in Peruvian law. The 322,500-ha “Reserva Comunal Tamshiyacu-Tahuayo”, for example, was legally established in February 1992 and has no permanent settlements. It is divided into a fully protected core area and an area of subsistence use. Programs implemented to control exploitation include prohibition of the use of nets and lances in the reserve’s ox-bow lakes during low water seasons and permit only hook and line methods. The local communities also forbid entry of commercial fishing operations and control the use of illegal fish poison. Fish populations in the area appear to be rebuilding and the local communities are directly benefiting from their self-imposed management programs (Bodmer et al., 1991). Central governments, too, see advantages in protected areas involving people. In November 1991, Brazil’s President Fernando Collor de Melo issued a decree to give the Yanomami, the largest Indian group in the Amazon rainforest, partial control of their traditional lands. The decree came after apparent last-ditch efforts by the Brazilian military to prevent it, because the Yanomami lands (in the north of the Amazon Basin) include the border with Venezuela, a militarily sensitive area. The
Yanomami will gain control of their land after the Government has formally surveyed the forest and established the boundaries, at a cost of some US$ 2 million. Mineral rights will rest with the Government. The decree comes as part of a zoning process which involves dividing the forest into zones for protected areas, traditional Indian farming and hunting, or for rubber tapers and others who use the forest without destroying it, and those areas where logging, roads, mines, dams, and other ecologically destructive development can take place.

On the northern side of the border, nearly half the entire Venezuelan territory of Amazonia has been declared a biosphere reserve. Located at the headwaters of the Orinoco river, it is home to thousands of Yanomami and Wekuana Indians. Covering some 83,000 km², it is the largest rainforest conservation area in the world. The Presidential decree creating the Orinoco-Casiquiare Biosphere Reserve, which contains within it the Parima-Tapirapecó National Park, was a response to concerns raised by the Indians themselves about the difficulties they were experiencing on the Brazilian side of the border. All colonization or development of the area by outside interests is prohibited, and special measures will be implemented to protect traditional livelihoods. Indigenous people are also represented on the group preparing the management plan for the region.

In Colombia, the new Constitution of 1991 recognizes the rights of indigenous people (2% of the population) and their autonomy in their territories which to date cover some 20% of the country's surface.

But national parks in South America have also been subject to the migration trends that have been associated with the economic and political history of each country and of the region at large. Traditions and ways of production developed in other regions have been imported into these areas with negative impacts on the ecosystems protected. But also, some of these inhabitants have adapted to the new conditions. Most are, however, looking for ways to find in these new lands the opportunities that were taken away from them in their regions of origin.

In short, national parks and other kinds of protected areas cannot be understood in isolation from the social, political, economic, and ecological processes which affect them. Ultimately, solutions for many of the threats facing protected areas belong in the realm of national and international politics. Important influences on the national parks of South America include land ownership patterns, the rights of indigenous people to land and resources, and credit and income inequities among agricultural producers. Such issues that are so politically volatile may be beyond the influence of park managers.

But as this important book by Stephan and Thora Amend clearly demonstrates, people are part of most national parks, and policies which ignore their presence are doomed to failure. On the other hand, recognizing the important contributions local people can make to national parks can be an important foundation in building new national cultures where conservation of biodiversity plays an important role.
All of this argues for national parks as an important contribution to the well-being of people in South America. It suggests that careful consideration needs to be given to how national parks should be managed to bring benefits to local people, building on the knowledge of indigenous people to ensure that biodiversity is conserved, that biological resources are managed in a sustainable manner, and that the benefits derived from protected areas are distributed in a fair and equitable manner. In other words, this book advocates that South American national parks should be managed to help implement the conservation of biological diversity.

Gland, February 1995

Jeffrey A. McNeely
Chief Biodiversity Officer
IUCN - The World Conservation Union
Argentina

The system of protected areas
Maria T. Fourcade de Ruiz
Diana S. de Uribelarrea

The legal status of national park inhabitants
Maria T. Fourcade de Ruiz

Los Alerces National Park:
protection and use of natural resources
Eduardo Jorge Myers
Diana S. de Uribelarrea

Lanín National Park: management of natural resources
together with local people
Nadine Osidala
Raúl Romero
Carlos Carvalán
The system of protected areas in Argentina

María T. Fourcade de Ruiz
Diana S. de Uribelarrea

Abstract: The national park system in Argentina began in 1903 with the donation of an area in the northwest of present-day Rio Negro Province to be preserved as a natural public park. Today the system consists of twenty protected areas. Nine of these are national parks, eight are units consisting of a park sector and a reserve sector, two are natural monuments and one is a nature reserve. All together, the system covers a total of 2,581,992 ha or 0.9% of the country's continental land area. Within the National Parks Administration, the Natural Resource Management Administration is the technical unit responsible for the protection of these areas and the control of all activities, extractive or otherwise, that might endanger their existence. The Department of Human Settlements, which functions within this operational unit, has the task of regulating the activities of protected area inhabitants. This department currently operates in coordination with the Regional Technical Delegations and each area where there are human settlements.

The history of the national park system in Argentina began in 1903 with the donation of land in the north-eastern part of what is now Rio Negro Province, to be preserved as a natural public park (parque público natural). This donation, made by Dr. Francisco P. Moreno, was accepted by the President of the Republic, General Roca, in 1904 and the land was reserved as a national park.

The creation of the Southern National Park (Parque Nacional del Sur) was finally decreed in 1922 and the original area of seven leagues was increased to 785,000 hectares. This park formed the basis for the present Nahuel Huapi National Park. Argentina was thus one of the first American countries, and certainly the first in Latin America, to undertake the creation of protected areas for conservation purposes. The Southern National Park Commission (Comisión Proparque Nacional del Sur), created in 1924, was placed in charge of all the initiatives for protection of the area. Finally, in 1934, the Argentine national park system was structured through the enactment of National Parks Law No. 12,103, which established the operating standards for the agency, and set up the objectives and features of the system thus created.

The new stage that now commenced was characterized by the development of Nahuel Huapi Park and the organization of the system, with the creation of most of the present national parks. The chief tools for development were the construction of
roads and the provision of facilities and services, thus giving the conservation agency’s actions a definite bias towards tourism: international tourism in the first place and national tourism later.

Although this program was rather tangential to conservation objectives, it was based on national objectives relating to the defense of sovereignty through consolidation of frontier areas. This strategy was completed in the southern part of the country with the creation of the national parks Los Glaciares, Perito Moreno, Los Alerces and Lanín. In all these parks the administration and management infrastructures that were established, still exist today.

Later, more attention was devoted to the expansion of areas considered to be representative samples of the country’s ecosystems, and there was growing interest in nature research, first in the flora and then in the rescue of certain animal species. Different areas of the country were studied, and their biological diversity was a determining factor in the creation of new parks: Laguna Blanca, El Rey, Pilcomayo and El Chaco.

Interest in conservation also gave rise to important in-depth studies covering the scientific aspects of the areas already protected, resulting in the creation of new parks, as in the case of El Palmar. A more recent approach reconfirms the objective of national parks as protectors of important hydrographic systems, such as the Calilegua and Baritú Parks.

The protected areas system presently consists of twenty land management units. Nine of these are national parks, eight are units consisting of a park sector and a reserve sector, two are in the natural monument category and one is a nature reserve. The entire system covers an area of 2,581,992 hectares, equivalent to 0.9% of the country’s continental land area.

The legal framework of the national park system: a brief synthesis

Natural areas protected at national level are under the custody of the National Parks Administration (Administración de Parques Nacionales, APN), a governmental institution attached to the National Agriculture and Livestock Secretariat (Secretaría de Agricultura y Ganadería de la Nación). The activities of this agency are regulated by Law 22,351 on National Parks, Natural Monuments and National Reserves, which in turn establishes the legal framework governing the system areas. Among the most outstanding features of this legal framework we find that it establishes only three categories of natural protected areas, defined as follows:

- National Park (Parque Nacional): Natural area that is not altered in any way except to fulfill essential tourist and national security requirements. Protection is inviolable, exploitation of floral and faunal resources, except in relation to tourism, is prohibited.
- Natural Monument (Monumento Natural): Inviolable area allocated for
The system of protected areas in Argentina

The protection of any plant or animal species or communities, or natural formations of scientific, scenic or historic interest. The only activities permitted are tourism and authorized scientific research.

- National Reserve (Reserva Nacional): Conservation area established either as a protection zone adjacent to a national park, or as an independent protected area when the designation of national park is not appropriate. Human settlements and development activities must be compatible with specified conservation objectives and priorities.

The legislation also clearly defines the activities that are permitted and prohibited in each category, and authorizes the National Parks Administration to proceed with the preparation and approval of long-term master plans that specify the actions to be taken concerning the protection of natural resources and environmental quality, and the regulations of human settlements. In conformity with this provision, the administration proceeded with the necessary planning and has already completed the management plans for the Nahuel Huapi, Lanín, Los Alerces and Iguazu National Parks, while the plans for Los Glaciares, El Palmar and El Rey National Parks are under preparation.

Budgetary and personnel restrictions affecting the institution have made it impossible to implement the new plans, but a bill is presently being drafted to replace Law 22,351, proposing substantial modifications aimed at adapting the basic concepts of legislation to present circumstances and thus providing efficient legal standards.

Of all the innovations introduced by the bill, perhaps the most outstanding is the reclassification of the protected area categories, which would now be as follows:

- Strict Nature Reserve (Reserva Natural Estricta): Areas of interest for the conservation of biological diversity because of their unique features, which need maximum protection against human activities. This category is presently included in the national park system under a decree issued by the national executive.

- Natural Monument: Differs from the present definition only in that it includes protection of fossil samples.

- National Park: Differs from the present definition in its emphasis on conservation of biodiversity.

- Nature Protection Reserve (Reserva Natural de Protección): Differs from the present definition because of its special role as a protective buffer zone for the preceding categories and because it gives priority to ecological balance over the use of resources.

The bill contains another aspect of particular importance in connection with the subject of human settlements in protected areas: a chapter devoted to inhabitants, which provides for a redefinition of their status and foresees alternatives that would guarantee these settlements compliance with the area's land use regulations or zoning.
Map 1

Argentina: conservation units

- Argentina
- Bolivia
- Paraguay
- Brazil
- Chile
- Uruguay

Legend:
- National park
- National reserve
- Natural monument
- National park and reserve

Map showing conservation units in Argentina, Bolivia, Paraguay, Brazil, Chile, and Uruguay.
Table 1

Argentina: conservation units

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Current situation

Although the protected areas run from the extreme north of the country to the south, it must be admitted that this system, not withstanding its great value, does not currently represent the enormous biodiversity that exists in the Argentine Republic. Of Argentina's twenty-five to thirty great ecosystems, only twelve are "sampled" in the present system.

This representativity is not only low, it is also disproportionate, since in the case of both the Andean-Patagonian system and that of the Oranian forest, the samples are much greater in size than those of other environments, thus causing difficulties in the administrative management of the whole, due to the great differences in area..
of the units involved. In addition, the National Parks Administration has to attend to the needs of each park and of the system as a whole, with insufficient resources to provide proper protection for the twenty units.

The protected areas in the north of the country are threatened mainly by illegal hunting, timber exploitation and grazing; the parks in the south, on the other hand, are subject to excessive tourist pressures (requiring greater recreation-type facilities) and the exploitation of forestry resources. It is also extremely difficult to control the livestock (cattle and sheep) activities carried out by the inhabitants in most of the protected areas. The action taken by the Administration in this respect is complex and slow-moving and achieves only partially acceptable results.

Only half of the twenty conservation units referred to above presently possess appropriate management and development conditions; there is a group of three parks where these conditions are more or less adequate, and the remainder may be considered as being at a very low level of implementation. The national park system does, however, possess an adequate team of trained personnel, among whom special mention should be made of the body of park wardens developed by the institution itself at a training center that is internationally recognized as being the only one in Latin America that trains specialized personnel to perform tasks relating to protection and conservation.

Notwithstanding the lack of an integrated environmental policy at the national level, the National Parks Administration and the provinces, which also have protected areas in their jurisdictions, are presently endeavoring to unify criteria and actions towards a common purpose, within the framework of the National Protected Areas Network (Red Nacional de Areas Protegidas) consisting of the provincial and national conservation organizations.

Lastly, from an internal viewpoint, the administration has been making efforts to further the decentralization and deconcentration process and bring its attributions into harmony with the interests of other sectors concerned with environmental issues and protected area management.

**Human Settlements Department**

The Natural Resources Management Administration (Dirección de Manejo de Recursos Naturales) is the technical unit responsible for the protection of the areas and all activities, extractive or otherwise, that could endanger their existence. The Human Settlements Department (Departamento de Asentamientos Humanos) is located within this operational unit, centralizing the regulations concerning the inhabitants and their activities. This department presently consists of an interdisciplinary technical team (a lawyer, a sociologist, a geographer and an agricultural engineer) and operates in coordination with the Regional Technical Delegations and with each park where settlers are established. Its objectives are:
- Budget management for human settlement programs and external financial assistance, through the cooperation of official and private agencies, both domestic and foreign;
- Coordination with the Park Warden Administration (Dirección de Guardaparques) in the selection, training and operation of personnel to carry out the programs.
- Technical assistance for projects to be developed in the parks, both by the technical team itself and with the cooperation of specialized organizations.

The programs are developed to achieve the following goals:
- promote and support actions to improve the living and working standards of national park inhabitants, particularly in lower income groups;
- contribute to the improvement of basic social infrastructures, in coordination with public or private, municipal, provincial or national institutions, in the areas of housing, health, education, etc.;
- ensure effective participation of the inhabitants in all phases of projects involving them by promoting community organization and recognizing these small local organizations as being the interlocutors with regard to the park administration in its work;
- support cultural initiatives originating in the communities;
- experiment with planned management models for sustainable productive activities, in which the park administration employs human and financial resources and which are aimed at offering diversified employment options in tourist services, intensive agriculture, plant nurseries, forestry exploitation and livestock management; in particular, those that permit the recovery of forest and natural pasture land areas that have been seriously damaged by overgrazing and lack of proper management.
- establish the true legal situation of the inhabitants and regulate the occupancy of park lands and the right to use natural resources found there.

**Editorial update:** Three new national parks have been established in Argentina in 1992 and 1993: Mburucuyá, Diamante Predelta, and Sierra de los Quijadas (Table 1). In 1991, Decree No. 2419/91 transferred the National Parks Administration (APN) from the Secretariat of Agriculture, Livestock, and Fisheries to the Secretariat of Natural Resources and Human Environment (Secretaría de Recursos Naturales y Ambiente Humano). The Law of National Parks, Reserves, Natural Monuments (No. 22,351 of 1980) is still in effect and, as of February 1995 its possible substitution has not made any progress (pers. com. D. Uribearena and R. Romero). However, a novel mechanism in the integration of new units in the National Park System is provided by the declaration of Strict Nature Reserves (Reservas Naturales Estrictas, RNE) by presidential decree. Decree No. 2148/90 defines RNEs as "areas in which direct human interference is reduced to a minimum possible, guaranteeing that flora, fauna, and ecological processes develop in a natural manner." This measure
basically provides a suitable fate to the diverse lands under state jurisdiction which until now had not been managed correctly. In 1990, it permitted the integration of an interesting area of low lying land and an ancient gorge of the Paraná River in the Otaúndí RNE (2,600 ha in Buenos Aires Province), which includes a sample of the natural habitats of the Paraná Delta, as well as some thorn scrub and grassland. The new decree also made it possible to give legal status to the protection of certain lands of the Eastern Chaco and some of the last remaining native forests of Paraná Pine (Araucaria angustifolia) in the San Antonio RNE (600 ha in Misiones Province; Chebez / Haene 1993). In 1994, the Leóncito RNE was declared with 75,000 ha in San Juan Province. Nevertheless, the National Park System is far from fulfilling its stated goal: “to conserve representative samples of the diverse types of natural environment, and thus biodiversity, of Argentina.” In order to create a new national park in Argentina, it is necessary to have public domain and jurisdiction over the land, a process which requires an act of Congress and is often very complicated (ibid.). Since Argentina is a federal republic, each of its 23 provinces has autonomous decision making power over its territory. Protected areas may be under either provincial or federal jurisdiction. Aware of the need to activate and complete the protected areas system, the National Network of Technical Cooperation in Protected Natural Areas (Red Nacional de Cooperación Técnica en Areas Naturales Protegidas) was instituted, which currently includes most Argentinian provinces and relevant organizations, like the National Parks Administration. This network serves as an effective forum for discussion in which policies are agreed upon, actions are recommended, and legal instruments debated to improve conservation of biodiversity. Through this work, the participating provinces share a mutual promise to take the measures necessary to improve the current situation. In 1992, through initiative of the Diamante Municipality, the Diamante Predelta National Park was created (2,458 ha) to preserve a sample of the Paraná River Delta. In 1993, the San Luis Province achieved creation of the Sierra de las Quijadas National Park (150,000 ha), with the goal of conserving a sample of “creosote” (Larrea sp.) scrubland and other types of shrubby vegetation of the El Monte Biogeographic Region. In 1994, of the total of 13 million hectares of protected areas in Argentina (2,800,000 ha in 26 areas protected by the federal government, and 10,800,000 ha in 184 areas protected by municipalities, universities, private organizations, and under provincial jurisdiction), 22% receive strict protection. Human pressures and productive activities (except for tourism) are prohibited from these areas. The remaining 78% belong to non-exclusive categories that allow for the presence of settlers, rural properties, grazing, and logging. Most of these are “multiple use”, “managed”, or “biosphere” reserves, and on federal land “national reserves”, all of which tend to be situated around national parks and serve to buffer them from the surrounding human impacts (pers. com. R. Romero, February 1995).
### Argentina: main problems in management of protected areas (1994)

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The legal status of national park inhabitants in Argentina

Maria T. Fourcade de Ruiz

Abstract: When Argentina's first national parks were created, human settlements of various kinds already existed on these state-owned lands. Historically, relations between the settlements and the National Parks Administration (the state agency responsible for the management, conservation and supervision of national protected areas), have not been governed only by legal standards, but also by social and political criteria that have varied with the course of time. Current legislation authorizes only a certain degree of natural resource use in nature reserves, while prohibiting any type of settlement in natural monuments and limiting occupancy in national parks to approved tourism operations. At the present time, the inhabitants of such areas may be classified, according to the type and legal nature of the settlement, as follows: settling and grazing permit holders, indigenous communities, private owners, concessionaires and squatters. These categories are subject to specific management rules regulating their relations with the National Parks Administration, and each of them has historical and legal aspects deserving individual analysis.

When the first national parks were created in the south of the Argentina, human settlements of various kinds already existed within the state-owned lands containing the protected areas. From their very creation, therefore, Argentina's national parks have had inhabitants and agricultural activities within their boundaries. The relations between these settlements and the National Parks Administration (Administración de Parques Nacionales), the state agency responsible for the management, conservation and supervision of federally protected areas, have in the past been governed not only by legal standards but also by social and political criteria that have varied with the course of time.

The current National Parks Law provides for the structuring of human settlements on privately-owned or state-owned land within the national reserves, subject to prior authorization. Such settlements may not exceed 10% of the area of each reserve. However clear this provision may appear in theory, in actual practice the results of its application have been neither as efficient nor as effective as could be desired, since the historical background of occupancy has generated conditions that now overrun this legal framework. This situation has made it necessary to elaborate new standards based on the present realities, considering not only the different status categories of national park inhabitants, but also all the political, social, economic and juridical variables that such occupancy involves.
The National Parks Administration has already been engaged in this task for several years, together with the National Protected Areas Network (Red Nacional de Areas Protegidas) and the most important non-governmental organizations in the country. They have been working on an integrated system to bring the human settlements and their activities into harmony with the different categories of the protected areas. This system should produce clear, specific, and effective legal standards. This may well be the most auspicious time for these measures, as a proposal for a new National Parks and Protected Areas Law is now in preparation, placing special emphasis on the rules for the establishment and development of human settlements.

**Present occupancy status**

Human activity in national protected areas is officially restricted to conservation. According to the current Law 22,351 on National Parks, Reserves and Natural Monuments (Ley de Parques y Reservas Nacionales y Monumentos Naturales) the following regulations apply:

- Human settlements of any kind in national parks are prohibited by law, as well as all economic exploitation apart from tourist-related activities. Nevertheless, some settlements still remain in these areas, especially in those national parks that were created in areas where settlements already existed.
- Restrictions on natural monuments are even greater, and the only settlements permitted are those essential for the maintenance and control of these areas.
- In national reserves, on the other hand, a certain degree of use of natural resources is permitted, and limited human settlement is tolerated.

The inhabitants of Argentina’s national parks and reserves can be divided into various groups according to the type and legal nature of the settlement: settling and grazing permittees, indigenous communities, private owners, concessionaires and illegal homesteaders (squatters). In view of their size and special features, the first three groups have a determining influence on the administration, management and control of the areas they occupy. They therefore will be dealt with in more detail in the following pages, including discussion of a legal decision concerning an indigenous community.

**Settling and grazing permittees**

Prior to the establishment of the first national parks in the south of Argentina, human settlements already existed in the state-owned lands involved. Settlers had occupied most of the fertile valleys under temporary occupancy permits issued by the national government through the Land and Settlements Department (Dirección Nacional de Tierras y Colonias). These settlers originally hoped that the State would eventually grant them ownership of their lands, but these hopes evaporated when the lands were included in the national park system. Although the authorities
tolerated their presence, they restricted their activities: limits on the number of cattle were established, and both logging and the hunting of native species were prohibited. The settling and grazing permits issued at that time had the following legal characteristics: a) they were personal and not transferable, expiring at the death of the holder; b) since they were granted on lands in the public domain of the State, they did not confer ownership of the land, and the National Parks Administration could dispose of the land at any time by simply giving notice to the occupant, who then had a maximum of six months to vacate it and was not entitled to any indemnity, only the opportunity to remove the investments that belonged to him.

This settling and grazing permit thus granted only the usufruct rights of the land, since notwithstanding the settler's de facto ownership of the area he occupied, he was exercising possession in another's name, in this case admitting the ownership of the State. Moreover, the temporary nature of the permit resides in the fact that it can be revoked at the will of the owner, since ownership rights are reserved to the party that has granted the usufruct rights. In actual practice, however, sociopolitical reasons prevented the application of the principle of expiration of the permit at the holder's death and the resulting recovery for conservation purposes of the occupied areas by the National Parks Administration. The action to be taken had to be adapted to each individual situation; thus in some cases permits were revalidated to descendants of the original settlers, and in others new permits were granted. In most cases, there was tacit recognition of the settlement by simply allowing it to remain, and in a few isolated cases relocation was sought, mostly ending up in court to enforce dispossession, which did not always occur.

Such is the situation today in the majority of the protected areas inhabited by settling and grazing permittees or their legal descendants. The National Parks Administration, therefore, until there is proper legislation on this matter, has decided to regulate legal-administrative relations with these settlers as follows:

- Recognition of the settlement is limited to occupants of Argentinean nationality who hold temporary permits, or their legal heirs. Only one homestead is recognized for each original permittee, regardless of how many legal heirs there may be. At the proposal of the respective national park intendant and subject to a favorable report from the technical department concerned, the administration authorities may include in this recognition cases of settlers not protected by temporary settling and grazing permits.

- The family group as described above must designate a representative who is the only person authorized to negotiate with the administration and through whom the latter recognizes the rights and determines the obligations of the settlement. This representative is designated by special power of attorney and must be a permanent resident of the settlement.

- In order to be recognized, the inhabitants must have been living in the area and using the permit uninterruptedly for at least the last twenty years, and the
authorized activities they carry out in the area must be the family group’s main source of sustenance.

- Notwithstanding these provisions, the National Parks Administration reserves the right to propose relocations, changes of activity, reduction of the number of livestock, or any other actions relating to human settlements and their activities aimed at improving the state of conservation of the areas in accordance with the management plan for the park in question.

In view of the weakness of the legal background for the occupancy of these permittees the National Parks Administration has decided to apply the above rules in a general, standard way so as to ensure fair treatment in all cases. Therefore, it will not recognize the rights of any occupants who do not fulfill the requirements indicated and will act in each case in accordance with the applicable legal provisions and regulations. The occupancy status of national protected areas as regards those permittees, including some cases of squatters whose presence has been tacitly permitted, is as follows:

- **Río Pilcomayo National Park:** 3 squatters
- **Chaco National Park:** 10 inhabitants
- **Baritú National Park:** 21 squatters
- **Lanín National Park:** 178 permittees
- **Nahuel Huapi National Park:** 62 permittees
- **Puelo National Park:** 3 permittees, 1 squatter
- **Los Alerces National Park:** 32 permittees
- **Perito Moreno National Park:** 3 permittees
- **Los Glaciares National Park:** 5 permittees

**Indigenous communities**

The indigenous communities clearly identifiable as such due to their characteristic organization and other typical features are concentrated in the area of Lanín National Park. Three indigenous groups of Mapuche origin are settled there: the Aigo community, in the Rucachoroi region (42 families), the Curruhuinca community, to the south of Lake Lacar (42 families), and the Cañíicul community, on the northern shores of Lake Huechulafquen.

Legally speaking, the situation of the Curruhuinca community is totally different from that of the other two, since the latter are only settling and grazing permittees, while the Curruhuinca own the 11,000 hectares of land they occupy in Lanín National Reserve. This fact is of extraordinary importance, since the National Parks Administration’s decision to grant the ownership of land is without precedent in the history of the protected areas of Argentina. This decision was a recognition of the rights of this indigenous tribe, which had been occupying the land since 1888, when the government authorized cacique Bartolomé Curruhuinca and his people to occupy three leagues of land at a place called Chapelco. This was the first land grant
made by the Argentine government to a Mapuche chieftain in the Neuquén region, after the "Desert Campaign" to ascertain the location of indigenous tribes in areas of public domain as a basis for pacification. Subsequently, the land area occupied by the Curruhuincas gradually increased under successive usufruct rights granted by the government.

When the Lanín National Park and Reserve were created in 1937, the lands occupied by the tribe fell under the jurisdiction of the institution that was the forerunner of the present National Parks Administration. It was only in 1953 that the above entity was authorized to issue a settling permit, free of charge, to each member of the Curruhuinca group, based upon the amount of livestock possessed and the extent of land under cultivation. Almost all the members of the group carried out a subsistence economy based on sheep, cattle and goat-grazing and the collection of firewood.

From that time until the enactment of the law that granted them title to their lands, the tribe constantly petitioned the National Parks Administration for a solution that would provide them with some form of guarantee with respect to the land they occupied. They specifically asked to be granted title to the lands which they held under temporary permits and where they had settled a century earlier. This request was directly opposed to the management strategy applied for many years by the National Parks Administration, the focal point of which was to maintain the inhabitants in a precarious situation so as to prevent greater consolidation of the settlements, either by encouraging their voluntary departure or by simply waiting for the permits to expire legally on the death of the permittees.

Finally, in 1988, the National Parks Administration authorities agreed to give the group title to their land, taking into consideration the historical background on which the claims of the indigenous group were based. This decision, that kept with the objectives of the latest national legislation on indigenous communities, meant not only the solution of a long-standing legal conflict with these inhabitants but also the end of a long history of restrictions and mutual distrust.

It is interesting to note that title to the land was granted by Law No. 23,750 / 89 on a communal basis to the Curruhuinca Rural Development Association (Asociación de Fomento Rural Curruhuinca), composed of all of the members of that indigenous community, and not to its members on an individual basis. In addition, all activities within the area are subject to the laws governing national parks, since the National Parks Administration retained jurisdiction over the area.

The short time that has elapsed since the transfer of title to the land means that it is not yet possible to determine its benefits for either the conservation objectives of the protected area or the socioeconomic situation of its inhabitants. The Human Settlements Department (Departamento de Asentamientos Humanos) of the National Parks Administration is presently working closely with the Curruhuinca community, particularly in the preparation of programs supporting their development activities.
Private owners

When the national parks were created, some private owners existed in the areas involved. These were persons who held title to the land and whose economic activities involved livestock and forestry. At the time of enactment of the law that established the present legal categories of national protected areas, most of these private properties were included in the national reserve sector, where the existence of private property for production purposes is permitted. In fact, in the majority of cases, this was the determining factor for delimitation between park and reserve, often going against ecological criteria. Nevertheless, some privately-owned lands still exist within national park areas, and the activities carried out on them are difficult to regulate under the Law because current legal mechanisms do not provide for effective control over private property to guarantee the proper conservation of the resources involved.

The protected areas most affected by the existence of private property are the Lanín and Nahuel Huapi National Parks. Lanín National Park contains fourteen private properties covering almost 15% of its area, consisting mainly of large ranches situated in the reserve sector or small areas occupied by seasonal residences. Livestock and forestry are the most common activities on the ranches, although in recent years some have begun hunting red deer for sport.

In Nahuel Huapi National Park there are 28 private properties representing about 10% of the total park area. Here too, the most significant proportion of the area under private ownership consists of large ranches that existed prior to creation of the park. The chief problem with such properties derives from the fact that there are no established rules regarding the activities carried out on them, as well as the difficulty in controlling such activities. As far as regulation is concerned, in the past the supervision focused almost entirely on forestry matters, and was relatively effective through control over silviculture, logging proposals, etc. On the other hand, there is no regulation, and hence no supervision, of livestock management, and neither mechanisms nor legal support have yet been created to provide effective control over private properties. The entry of park wardens for supervisory purposes is only possible with the owner’s consent or authorization, or failing this, through a court order. In this way, some clandestine activities of which it is relatively easy to hide the evidence (e.g., illegal hunting) are almost impossible to control, and the fate of the fauna therefore depends on the interests and the degree of conservationist conscience of each individual owner.

On the lands belonging to private owners, the limitations for the intervention of the National Parks Administration arise as a direct result of the legal nature of ownership rights under Argentine legislation, which regards these rights as exclusive and perpetual, empowering the owner to “use and enjoy his property at will”, allowing him to “denature it, degrade it, or destroy it.”
Although some reforms have been made to these provisions in order to restrict the unlimited nature of these rights, cases in which they have been applied are practically non-existent. As a result, the National Parks Administration is now engaged in the challenging task of including in the proposal for a new protected areas law a series of provisions enabling the park authorities to regulate and control the activities carried out in the private properties located within their jurisdictions. This is unquestionably a matter of national interest, since it involves the protection of a natural heritage common to the whole Argentine people.

**Concessionaires**

From a legal standpoint, the occupancy exercised by the concessionaires is the least conflictive since it is regulated by specific rules that clearly define their rights, obligations and restrictions, as contained in the legal or contractual instruments governing their activities. Most of the concessions for use derive from recreational and tourism activities carried out in national parks. The relations between the beneficiaries and the park administration have not given rise to any lasting problems; any disputes that have arisen have been settled in accordance with the established provisions. These concessionaires have therefore been included in this chapter only in order to define them as another class of protected area inhabitant.

**Squatters**

When discussing the status of the settling and grazing permittees, it was already noted that some of the inhabitants of lands under the jurisdiction of the National Parks Administration fall into the category of intruders or squatters, since this applies to the great majority of the present inhabitants, who are descendants of deceased permittees. In addition to these “recognized” squatters, however, there are some long-standing settlements of people who were never authorized to occupy their lands, make improvements of any kind, or possess animals. For such cases, the current law on national parks empowers the governing authority to undertake the expulsion of intruders on land in the public domain. These occupants will be required to vacate the property within thirty continuous days. If the property is not vacated, the courts may demand the immediate expulsion of the occupants, aided by the police force if necessary. Any legal action for financial compensation shall be brought afterwards by the parties. In practice, this provision has had little effect, for the great number of years that the intruders have been established on the land, the permanent nature of their settlements, their peaceful occupancy and the tacit tolerance of the situation by the National Parks Administration for so many years. Indeed, we believe, that the solution to this problem requires an overall program for the regulation of human settlements in national protected areas.
Conclusion

The above is a general outline of human occupancy in national parks and reserves and the legal relations between these inhabitants and the agency entrusted with the custody of such areas. The professional technical team, assigned by the National Parks Administration, is searching for appropriate mechanisms to receive, process and channel the demands of all the parties involved in the occupancy and use of protected area lands.

There is, however, a basic need for legislation providing for redefinition of the legal status of the inhabitants, as well as alternatives that would ensure the inhabitants' compliance with the respective land regulation requirements for the area. The bill under preparation seeks to furnish the necessary legal support for an innovative policy in this field and to improve upon the existing law by offering a formula that will enable human settlements to exist in areas destined for the preservation of natural resources.

Editorial update: In February 1995, the bill for a new National Parks and Protected Areas Law still had not been approved legally and, for various reasons, no further attempts had been made to interest legislators in its ratification. In view of the legal difficulties, the National Parks Administration emitted a series of internal resolutions concerning the regulation of the settlements and activities of the inhabitants within protected areas (pers. comm. R. Romero, February 1995).
Los Alerces National Park: protection and use of natural resources

Eduardo Jorge Myers
Diana S. de Uribelarrea

Abstract: When Los Alerces National Park was created in 1937 in the Andean Chubut province, some 137 settlements already existed in the area, mostly concentrated in the southern and eastern parts of the Park. These inhabitants, whose chief occupation was livestock-grazing, were allowed to remain through the granting of "temporary settling and grazing permits". These permits were personal and non-inheritable, although in practice these restrictions were not enforced. Based on recognition of areas with different natural characteristics and human uses, the Park's management plan established a system of zoning for the regulation of inhabitants and their economic activities. The protected area was divided into two management categories: the strictly protected national park sector and the reserve sector, within which two zones admit human occupancy: the multiple use zone and the environmental recovery zone. The first of these zones applies to inhabitants with whom it is possible to agree on the management of their livestock; in the area of the environmental recovery zone, the objective is to achieve a gradual elimination of livestock. Various actions, previously agreed upon with the inhabitants, were carried out within this framework.

Los Alerces National Park is situated in the northeast of Chubut Province. It covers an area of 263,000 ha, of which 185,000 ha are in the national park category and 75,000 ha are a national reserve. The climate is humid cold-temperate and markedly seasonal. The cold, rainy winters (2°C, with snow) are followed by drier summers, with mean temperatures of 24°C and cool nights.

The main features of the region are its rugged terrain, high peaks and numerous valleys formed by glaciers with a complex lake system. The lakes are surrounded by mountain ranges, covered by forests of deciduous species (Nothofagus pumilio, N. antarctica), and evergreen species (Austrocedus chilensis, Nothofagus dombeyi, Lomatia hirsuta). In the western sector, abundant rainfall contributes to the formation of the most exuberant and diversified forest community within the Patagonian Andes, the Valdivian Forest, which contains wonderful stands of alerce (Fitzroya cupressoides). The alerce is a true subantarctic giant: it attains heights of 60 m and diameters over 3 m. The age of some specimens has been estimated to be between 2,000 and 3,000 years, therefore it is one of the four recorded millennial forests in the world. Another very particular plant assemblage of special scientific interest for their biological characteristics is the "maitenal". Maitén, or pickwood
trees (*Maitenus boaria*), are regular components both of the forest and of the transition area between this ecological community and the Patagonian steppe. Herbaceous communities and pasture lands are infrequent and mostly induced by disturbances in the area, such as fire and overgrazing by cattle. The Park hosts significantly large populations of endangered species such as the Southern Andean “huemul” deer (*Hippocamelus bisulcus*), the pygmy Pudu deer (*Pudu pudu*), the tiger cat (*Felis guigna*) or the Chilean pigeon (*Columba araucana*). The Chucao tapaculo (*Scelorchilus rubecula*), a very tame terrestrial bird, and the Magellanic woodpecker (*Campephilus magellanicus*) may also be seen.

**History of park occupancy and use of natural resources**

At the time Los Alerces National Park was created, there were no less than 137 homesteads, the majority concentrated in the southern region in the valley of Amutui Quimei and on the southern and eastern margins of Lake Futalesicum. Other regions of occupancy were the northern margin of that lake and lakes Rivadavia and Verde, while the areas that now lie within the Park remained unoccupied (Koutche et al., 1937a and 1937b). The majority of the inhabitants were squatters, more than 80% of Chilean nationality, the others being of European origin, with a small proportion of Argentineans.

From 1938 onwards, the National Parks Department issued temporary settling and grazing permits, but the benefit of such legal recognition was not granted to the inhabitants of the southern region, who were therefore evicted or left the area voluntarily when the Park was created.

The principal activity of the original inhabitants of the Park was livestock-grazing, chiefly sheep, with cattle in smaller numbers. These ranchers had little concern for conservation of their natural environment; quite to the contrary, the cutting or burning of woodlands was their usual way of increasing the area of their pasture lands (Koutche et al., 1937a and 1937b). The combination of fire and overgrazing had a very severe disturbing influence: it had irreversible effects on the physical, chemical and biological characteristics of the soil due to the exhaustion or removal of the plant mass. This situation, with its negative effects on ecosystems not adapted to the introduction of large herbivorous animals, affected the areas with the largest number of inhabitants.

**Present state of occupancy**

After the creation of Los Alerces National Park, the Parks Administration authorized some of the original occupants to remain by granting them temporary settling and grazing permits, which could not be transferred or inherited. This step only served to create a problem for the future, because at the death of the permittee
the National Parks Administration was faced with a de facto situation: the occupants and their productive activities, endorsed by many years of settlement and the permit granted at the time, and on the other hand the irregular legal situation created by the lack of provisions governing these settlements and their activities. No solution has yet been found to the conflict arising between two legitimate positions: the institution's responsibility for managing the area so as to fulfill conservation objectives, and the settlers' claim for recognition of their legal status.

Forty-two family groups currently live in the park; 25 of them are engaged exclusively in livestock-grazing, 3 combine livestock-grazing with tourism-related activities and 3 with commercial activities. Of the remaining 11 settlements, 7 are exclusively engaged in tourism and 4 in other activities. In addition to these inhabitants, some 300 persons live in Villa Futalaufquen, the Park's administrative center: employees of the institution or of entities that provide community services such as teaching, health, communications, and trading.

Most of the usable land in the reserve sector of Los Alereces National Park is occupied by pasture lands, mainly for sheep (1685 head, according to the data obtained in the 1989/1990 census), cows (1516 head) and, to a lesser extent, horses (150 head). The socio-economic level of the inhabitants is closely linked to the
number of animals they possess and the development of one or more economic activities. It was determined that a threshold of 100 animals clearly distinguished two sets of inhabitants: a higher stratum composed of the owners of 200 to 500 animals, who represent 15.8% of the population and own 62.4% of the livestock, while the owners of less than 100 animals represent 84.2% of the population. In the first group there is no dependence on other economic activities to supplement livestock-grazing, which is their chief source of income, covers their basic needs and generates a certain surplus which varies according to circumstances, although it does not reach adequate productivity levels. The second group is distinguished by its dependence on other activities carried out by at least one member of the family group. This trend is particularly evident in families that own less than 30 animals. The inhabitants in this stratum can be divided into three levels: those on the highest level, who more or less meet their basic needs, the middle level, who partially meet them, and the lowest level, who fall short to a considerable degree. This division into categories provides a means of defining clearly the situation of each inhabitant, thus allowing the most appropriate action to be taken in each case.

**Evaluation of the environmental impact of livestock-grazing**

The areas used for livestock-grazing have been classified according to their degree of deterioration. The surveying and mapping studies made have led to several conclusions, the first of them being that there is no grazing without damage to the natural vegetation, since this consists entirely of woodlands, except for a few pasture lands in high altitudes. Grazing and browsing, even with low densities of livestock, result in the deformation or loss of young shoots of the species most attractive to livestock. The cases of least disturbance occur in some areas of summer pastures, very extensively used and far from settlements and winter pastures, usually consisting of forests of Antarctic false beech (*Nothofagus antarctica*) and bamboo (*Chusquea sp.*). This seasonal grazing with its low loads affects the biomass and density but does not affect the plant composition. However, in pasture areas, where pickwood trees (*Maitenus boaria*) are common, livestock eat practically all young shoots of this most edible species, and the natural composition is altered considerably. When livestock, especially sheep, are continually present, or with high densities on winter or winter-summer pastures, the damage is greater: the composition is modified and there is loss of tree, shrub and herbaceous cover. In extreme cases, there appear areas devoid of forests, with naked and eroded soils.

The situation described above calls for the adoption of management action involving zoning and regulation of livestock use. Different zones were defined based on ecological, social and productive features and state of conservation. Based on the zoning proposal, strategies can be established for solving and regulating the problems of the settlements and their productive activities. Two management zones compatible with human use were determined in the reserve sector of Los Alerces.
National Park: the multiple use zone (Reserva de Uso Múltiple) and the environmental recovery zone (Reserva de Recuperación de Ambientes). The multiple use zone admits productive activities with management restrictions and guidelines that guarantee conservation of natural resources, and is applicable to inhabitants with whom it is possible and desirable to maintain and regulate their production systems by setting up short-term management plans as well as medium-term plans for the recovery of degraded areas. This is the case of the majority of the settlements on the eastern shores of lake Futalaufquen and in the “Maitenal” area.

In the areas of the environmental recovery zone, the goal is to achieve a gradual reduction and/or elimination of livestock on a medium-term basis. In the remaining protected area, that belongs exclusively to the national park category, all productive activities are incompatible with the established regulations; the strategy therefore aims at relocating livestock in the multiple use zone.

Inhabitant policy

The homesteads of Los Alerces National Park, like those of other parks, were generally established there before the Park was created. This occupancy was based on policies set up by what was then the National Land and Settlement Administration (Dirección Nacional de Tierras y Colonización). This agency issued lease contracts to the settlers for extensive areas of land, charging a rent agreed upon in the contract. The lessee was obliged to make investments in housing and labor, to bring in a specified amount of livestock and to cultivate the land. These contracts included some clauses to protect the environment: for example it was forbidden to exploit forests or burn them to increase grazing areas.

When the Park was created in 1937, it took over the responsibilities of managing the settlements located within its jurisdiction. The Park administration’s first step, in keeping with the policy of developing and populating these frontier areas (Bustillo, 1968; Morello, 1984a and 1984b) was to authorize the inhabitants to remain in the Park, turning the lease contracts into temporary settling and grazing permits. The wording of the latter was looser and less specific than that of the original contracts. It only specified the area to be cultivated by the occupant and assigned him a quota of livestock, usually the amount he had stated to possess when the Park’s administration took over. There was no mention of the permittee’s obligations, other than his undertaking to comply with the regulations, declare his amount of livestock every year, apply for authorization to make improvements, and pay the annual grazing rent. The vague nature of such permits, which are still valid today, means that the settlers continue to occupy land without specifying their exact location and limits, suitability for agriculture and livestock, and state of conservation.

A historical and political analysis leads us to suppose that these temporary permits arose within the framework of two opposing positions, one that sought to
establish settlements and another one, more in line with the traditional national park policy, that sought to keep the areas in their original state and followed the governing principles of Yellowstone (Bustillo, 1968). Hence the vague and imprecise terms of the permits, which accepted the settlements, but in an atmosphere of legal uncertainty that created the expectation that the settlers would either leave the area voluntarily or be evicted in the long term.

During the 1940s, amid profound political changes, the traditional national park theory prevailed, and this was reflected in the wording of the laws that then governed, and still govern, the national parks. The ruling principle was clear: the inhabitants and their agricultural and livestock activities were incompatible with the philosophy and existence of the national parks. Strict control was therefore exercised over all activities, all attempts at development were prevented, it was forbidden to set up fences or engage in grazing or agriculture, with the resulting increase in legal uncertainty. This policy gave rise to undesirable results like the irrational management of natural resources, due to the prohibition on the introduction of new technologies and improvements necessary to minimize environmental damage. Another negative consequence of this restrictive policy was that it impeded the improvement of production levels and thereby the increase of incomes and standards of living. If the inhabitants had had greater access to financial resources, this would likely have enabled them to take an interest in other activities being developed by the National Parks Administration, in particular, tourism-related activities, which were an alternative to livestock-grazing and which, being non-extractive, would have had a lower impact on the environment. Another feature of the Park's policy was that it sought to find a single solution for all, not considering the individual characteristics, hopes and vocations of each inhabitant.

The first attempt to relocate the settlers outside the boundaries of the Park met with difficulties due to the lack of available state-owned lands, as well as the lack of funds for covering moving expenses or subsidizing the inhabitants' new housing, fencing and credits for development. A basic aspect that was not taken into account was the deep attachment to the land that is typical of rural inhabitants, strengthened in this case by their constant claims to their rights over the land of their ancestors.

Another attempted strategy was the gradual conversion of inhabitants in the Park by turning them into providers of tourist services: care of camping sites, sales of regional products, etc. This arrangement, which was more like their original way of life, did not take into account a series of negative factors that hindered their success, such as lack of training, the brief duration of the tourist season with few visitors to the Park, the fact that the best sites for tours are far from the settlements, and —the greatest obstacle of all— the lack of appropriate legislation. Here, too, the absence of a special budget made it impossible to subsidize the change of activity through the investments that the new services required.

In some cases, however, it was possible to achieve this change, usually as a complement to the traditional activity of cattle-raising, which provided basic pro-
Argentina. Photo 1: Several of the snow-covered peaks of the Andes are included in the National Park System of Argentina. Photo 2: The National Park Administration of Argentina is one of the oldest in the continent. Its headquarters in Buenos Aires also houses the Human Settlements Department that coordinates all actions related to inhabitants in the national parks and reserves throughout the country.
Argentina. Photos 3/4: Los Alerces National Park. In the vast protected areas of southern Argentina, the National Park Administrations established a typical architectural style for their buildings. The wooden fences of livestock grazers form a traditional element of the landscape.
ducts such as meat, milk, hides, etc., and continued to be the chief source of income outside the tourist season. The people who undertook these new activities were those with the highest standards of living, and in most cases, they were the children or grandchildren of the original inhabitants. Due to the temporary character of the permits, the land could not be assigned as a guarantee to encourage investments. Although perpetual exploitation was ensured, the legal uncertainty prevented the beneficiaries from having access to credits, and investments thus had to be made from their own funds, which necessarily came from cattle-grazing.

Title to the land was, and continues to be, a claim strongly supported by the inhabitants who have made investments in improvements. The sale of land within the parks can have both positive and negative consequences, and should therefore be carefully evaluated before making any decision in this regard. On the one hand, it benefits those who have made investments in tourist enterprises, but at the same time ownership is also sought after by the more affluent cattle-breeders, who need extensive areas and carry out activities considered undesirable within protected areas. At this point in the analysis it should be emphasized that experience in Argentina’s parks has shown, that before undertaking any program with the inhabitants appropriate legal and financial mechanisms should be established.

Management activities concerning the park inhabitants

Within the context described above, it was necessary to design a plan for finding a solution to the difficult situation of the inhabitants of Los Alerces National Park. The first priority was to gain their confidence by showing them that the proposals were valid and feasible. Any action to be taken had to be adapted to a more realistic interpretation of current legislation. An in-depth analysis of each case was necessary, setting aside the attitude that the problems called for common generalized action for all the inhabitants. Instead, action was taken in accordance with the settlers either on an individual basis or by grouping small numbers of cases that were similar and thus required similar solutions. Both parties, the settlers and the National Parks Administration, had to be convinced that the agreement would benefit them in the medium and long term, while short-term action would comprise extension work and tests of the new proposals, in some cases by trial and error due to the inhabitants’ lack of experience or their disbelief in the new ideas. In cases that were impossible to resolve or that seriously compromised the institution’s actions, the possibility was studied of adopting extreme measures such as eviction or the cancellation of permits. Based on the above considerations, the management plan for Los Alerces National Park was drawn up in 1986. At that time, an analysis of the problems of human settlements in the Park revealed a series of factors that required special attention in the short and medium term:
- the inhabitants' desire to consolidate their settlement within the area of the Park;
- the occupation of strict protection areas within the national park sector and lack of institutional decision to face the problem;
- the absence of institutional involvement in establishing clear rules for productive activities and giving advice on non-damaging management practices;
- the lack of incentives for the development of alternative activities;
- the existence of institutional restrictions on the recovery of degraded areas through proper management practices.

As a result of this analysis, the following four basic objectives were drawn up to govern the program:
- define the long-term legal status of the inhabitants;
- harmonize the inhabitants' presence, activities and expectations with conservation objectives;
- provide alternatives for production, location and promotion to improve the inhabitants' living conditions;
- guarantee effective supervision by the institution through regulation of productive activities and technical assistance.

The first management step taken was to conclude the proceedings in cases where legal action had been instituted to obtain eviction of inhabitants:

a) who had settled illegally in the national park sector;
b) who had abandoned settlements leaving third parties in charge without any rights;
c) who had to be expelled from the Park because of their unruly behavior.

This stage took only a short time since the cases in question were of long standing. Relocation was the second management alternative used. Three cases show that by optimizing benefits for both the inhabitant and the institution, significant progress can be achieved in regulating human activities:

**Case 1.** This was a senior inhabitant who occupied an area of significant scenic value and also held an other plot of land adjacent to the Park, at some distance from the first area. A long-term contract was signed by the inhabitant agreeing to vacate the park sector he occupied, in exchange for which the Park’s administration granted him a new lot adjacent to his other land. In this way he would exploit a single area of land and the Park’s administration was able to develop tourism in the area freed of occupants and cattle.

**Case 2.** This was the son of a long-time settler, the head of a large family, who had little desire to continue in the rural lifestyle but instead had other ambitions for work and progress. His idea was to emigrate to another region with better studying and working conditions for himself and his children. This inhabitant’s living standards were at the subsistence level and he owed large sums of money to the Park’s administration for unpaid grazing rents. Arrangements were made for him to move to a town, the municipality was asked to grant him a plot of land, and efforts were made to find him a suitable job. In exchange, the occupant agreed to remove his livestock.
and improvements from the park sector. To make things easier for him, the Park's administration released him from his debt and provided him with transportation for his belongings, and also supplied lumber to build his new dwelling.

Case 3. This is the most outstanding case and refers to an inhabitant of the strict protection zone, who, since he was breaking the law, had to pay an annual punitive rent for his livestock. The homestead was situated in a region isolated by lakes and rivers, and the occupant therefore had to cross the lake by raft to take his production out and bring in supplies. The area is humid and densely wooded, making it unsuitable for livestock-grazing. These features undoubtedly had a negative impact on the results of exploitation. The occupant and his sons were persons with affinity for farming, and they had made investments in agricultural machinery to facilitate development. The change in the institution's policy generated closer relations with the occupant, who became interested in reaching an agreement. Successful negotiations finally allowed relocation outside of the strict protection area in a zone suitable for cattle-raising within the multiple use zone in the reserve sector. He was supplied with transport for his relocation and lumber to build his new dwelling and fences. The occupant benefited from his relocation since he could increase the number of heads of cattle, had better access roads, and had to pay a grazing rent that was much lower than the punitive rent. Above all, he achieved greater legal security for his occupancy. In addition, the National Parks Administration arranged for technical assistance. The institution, for its part, benefited from being able to vacate the strict protection zone after over fifty years of occupancy, thus ensuring its recovery and achieving one of the priority objectives of the management plan. The institution's presence was strengthened in an area where its jurisdiction was dubious and, more importantly, it generated confidence among the other occupants as to its intention of fulfilling its obligations. This was a determining factor for the policy under execution, and other occupants thus approached the institution to state their interests and propose solutions.

The third management step was the recognition of occupancy situations. This included inhabitants who did not possess livestock but who were settled in the park because they were children of long-time occupants, and who, as they had secure employment in community and tourist services, were allowed to continue residing in the area where they had been born. The employees of the National Parks Administration, who did not possess official dwellings, or who wished to live in their family homes, were authorized to live in the park as long as they remain employees. They were assigned plots of land of approximately one hectare, where they could build their houses or cultivate vegetable gardens and raise farm animals. In the case of the old and retired people, they were granted the right to stay in their homes for the rest of their lives.

In synthesis, it may be concluded that the action taken in Los Alerces National Park to solve the problems of the inhabitants was an important first step in drawing
up and implementing a new institutional policy. Within this political and technical framework, the National Parks Administration of the Republic of Argentina has commenced programs for the regulation of human settlements and their activities in its parks.

*Editorial update:* According to the park administrator, this rather successful management policy remains unaltered, despite the minor problems that sometimes arise between the inhabitants and the park authorities (pers. com. E.J. Myers, 1994).
Lanín National Park: management of natural resources together with the local people

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Abstract: Lanín National Park, located in Neuquén province, is inhabited by four Mapuche indigenous communities, by settlers who do not own their land, and by owners of large properties. While the last group has always been certain of its land tenures, the Indians and settlers have faced poor economic conditions and constant pressure to vacate the area, which have resulted in deterioration of the natural resources and in impoverishment and emigration of the population. To reverse this situation, it was necessary to take into account the communities’ legitimate claims, such as the right to the land and improved living and working conditions. In recent years, therefore, the National Parks Administration has been working jointly with the Mapuche communities and the settlers so as to promote socio-economic development that is compatible with conservation of the protected area, by implementing an alternative management of agriculture, livestock, forestry, fruit-growing, and tourism.

Lanín National Park and Reserve were created in 1937 in the Aluminé Huilches and Lácar Departments in the south-western sector of Neuquén Province, Argentina. They occupy a total area of 379,000 ha, of which 194,600 ha form the National Park and 184,400 ha the three sectors of the National Reserve.

The terrain of this area is mountainous, with steep gradients usually over 30%. U-shaped valleys formed by glaciers predominate, and 24 lakes of glacial origin contribute to the majestic impression of the landscape. The highest peak is Mount Lanín (3,776 m), a permanently snow-capped, cone-shaped, inactive volcano that is more than 1,500 m higher than the surrounding mountains and dominates the landscape from every possible angle. The soils are very fertile since they evolved from volcanic ashes. The climate is temperate-humid, with mean temperatures of 4°C in winter and 20°C in summer. Snows occur from May to October and precipitation averages 1,800 mm a year, although in some areas it may exceed 4,000 mm.

The sub-Antarctic and north Patagonian type forests found in the Lanín National Park and Reserve are extremely important for conservation. Indeed, the only forests of araucaria (Araucaria araucana) and false beech (Nothofagus nervosa and N. obliqua) in the national protected areas system are those of Lanín. In addition, the Nothofagus nervosa populations are of great economic value as a gene bank, since it has been detected that they are able to withstand very low temperatures. There is a growing demand for their seeds in plantations of northern Europe, which makes them an economic resource of potential importance for Argentina.
Characteristics of the social groups

Long before its creation, the protected area was already inhabited by various social groups: indigenous Mapuche communities (made up of the Curruhuinca, Cayún, Cañicul and Aigo groups), settlers, and owners of large estates. From 1876 onwards, as a result of the "Desert Campaign" which conquered the pampas and adjacent areas and exterminated a considerable number of the indigenous populations living in the region, a new territorial organization was instituted. The land was distributed among the new owners: ranchers, settlers, businessmen, national and provincial administrations, and the army; while the vast areas occupied until then by the Mapuches were reduced to small reserves located in the mountain valleys (Curruhuinca, 1984).

Thus, the Curruhuinca community settled on the land it now occupies on the north and south shores of Lake Lacar, distributed in four sites: Quila Quina, Pil Pil, Puente Blanco and Piedra del Trompul. This community was authorized to settle in the region in recognition of its collaboration with the Argentine army during the Campaign. Subsequently, when Lanin National Park was created, the occupancy of the Curruhuinca on a temporary-permit-basis was ratified by national decree. Finally, in 1988, they received legal title to the land as a community.

The Cayún community did not take part in the alliance with the army, and their lands were given to the Curruhuinca. This caused them to emigrate to Chile; only one of their members returned and settled at a place called Piedra de Trompul on the north shore of Lake Lacar (González, 1987). His descendants now hold the land under a temporary permit and are negotiating the assignment of the area they occupy.

The Cañicul community lives on the shores of Lake Huechulafquén at sites known as Contra, Huechulafquén and Paimún. The area occupied by this group lies actually within the national park sector, which only permits minimal infrastructure for the Park's control and protection. Lastly, the Aigo community lives in the Rucachoroi river valley in the national reserve sector, some 30 km from Aluminé. Both, the Cañicul and Aigo communities, hold temporary permits to occupy the land.

The Mapuche social and cultural organization is structured at three main levels: family, community and inter-community. The family is the basic economic and social unit as far as production is concerned. The livestock and the produce of the land are the individual property of each family. The land itself, however, is considered as community property. The settlements have a dispersed pattern since each family lives with its animals at some distance from the others. Selection of the site depends on the availability of water, pasture lands and other resources, like araucaria seeds, or apple trees. The homesteads themselves consist of several separate buildings: the kitchen on one side, the living area several meters away, and the storeroom further on (Osidala, 1988).
Map 1

Argentina: human occupation and land tenure in Lanín National Park and Reserve

- lakes
- private property
- settlers and indigenous communities
- army land
- national park boundary
- national reserve boundary
The second social group, composed of settlers, established itself in the southwest of Neuquén Province, when the national government encouraged the settlement of the region early this century. The occupation process was subsequently stopped by the national and parks authorities upon creation of Lanín National Park. The descendants of these settlers, who still live in the area, were granted temporary settling and grazing permits for cultivation and for the grazing of horses, cattle, sheep and goats. It was stipulated that the permittee could not make improvements without the authorization of the National Parks Administration; additionally he undertook to comply with all current and future regulations. The permit holder had to declare annually the amount of livestock he possessed and the area of land under cultivation. No livestock could be brought in unless authorized by the institution. The permit was personal and non-transferable. The Administration could dispose of the land when it deemed desirable or at the holder’s death. In the former case, notice was given to the permittee or his descendants, who then had six months to vacate the site, with no right to any indemnity.

Although the National Parks Administration accepted the indigenous communities and the settlers by granting both groups temporary settling and grazing permits, its real intention was to evict them. Notwithstanding this restrictive policy, the continued occupancy and exploitation of the land by the holders of the permits and those who inherited them created both a precedent and a de facto and de jure situation, which they have maintained from the creation of Lanín National Park until today.

The third social group, the owners of large properties, were already established before the creation of the protected area. They had obtained the land as a reward for financial contributions made to the Desert Campaign.

When the National Parks Administration took over responsibility, it accepted all private property and declared these sectors a reserve zone, where certain productive activities are permitted, such as forestry, tourism, cattle-breeding, etc. Since they possessed title to their lands, these inhabitants were never asked to vacate the park.
Although the national authorities had the power to expropriate them, for political and economic reasons this alternative was never taken into consideration.

**Economic activities of the inhabitants**

The prevailing productive activity of the settlers and the members of the Mapuche community is migratory livestock-raising. Both groups are sheep and goat breeders and carry out extensive grazing. They take advantage of the change of seasons to rotate the pasture lands, performing what is known as “winter grazing” and “summer grazing”. In winter they remain on the lake shores and in the low valleys (winter pasture zone). In November, after the lambing season and shearing, they take the animals and some family members up to the foothills and high valleys (summer pasture zone), where the pasture lands are irrigated by water from the melting snows. There each family lives in a little hut; and in March or April they descend again to repeat the cycle. This seasonal shifting between two well-specified areas is called transhumance. Distances between winter and summer pastures vary considerably: in some cases the distances are short, for example in the same valley, and in others up to 150 km have to be traveled. The number of animals in these journeys ranges from a few dozen to hundreds, depending on the family. Each family generally gathers the animals of parents and married children into a single nucleus. The animals graze in fields close to the family dwelling. The children have the task of rounding them up in the evening and herding them into pens for the night. The indigenous communities work together in caring for the breeding animals, and regulating the lambing season.

The State imposes nation-wide obligations on livestock breeders, such as branding their animals, vaccinating them against aphthous fever and applying anti-scabies baths. The animals are used to provide meat and sheep wool, the sale of which is the main source of income for the indigenous communities, enabling them to pay off their debts in the *boliches* or small grocery stores where they obtain sugar, flour, *yerba mate* and other supplies (Osidala, 1988).

**Impact of activities**

There are several activities that have an impact on the national park: livestock-grazing, forestry and tourism. Livestock-grazing, which is the oldest and most widespread activity, occupies a large area of the Park and causes the greatest impact. As can be seen from Table 2, there is selective pressure on types of vegetation. The low forests are those most affected by livestock, while the dense high forests are more resistant. The young shoots, however, are affected by excessive browsing in the areas opened up by fires, landslides and clearings.

Summer grazing is significant in the pasture lands of high altitudes, but severe livestock impact is rare because of the obligatory rest imposed on such areas in
winter, part of autumn, and spring. Lastly, the herbaceous steppe with shrubs and
thickets has sparse vegetation for climatic reasons. Livestock-grazing, however, is
not the only cause of denudation, since erosion by both, wind and water, is an
aggravating factor.

The impact of an activity differs according to the people that carry it out. In the
case of private estates, it can be described as a controlled impact caused by an
economic rationality, providing a certain level of protection for the resources being
exploited.

In the case of the indigenous communities and small producers with temporary
permits, the degradation of the resources is due to the historic land occupancy
process imposed on them by the National Parks Administration. On being confined
to small plots of land in the Park’s valleys, they were forced to make excessive use
of a limited area, thus setting in motion a process of general impoverishment of such
areas which led to over-use of natural resources, soil erosion, critical sanitary and
nutritional conditions for the animals, and deterioration of the inhabitants’ standard
of living.

The situation is further aggravated by the legal uncertainty as to ownership of the
land and the lack of improvements and technical knowledge due to the low income
level in this social group.

The Mapuche communities
and the sustainable resource use program

The Human Settlements Department’s program for Lanín National Park consists
basically of a series of plans to aid the indigenous communities (Curruhuinca,
Cayún, Cañicul, and Aigo) and other populations established there. Its principal
objective is to preserve the social and cultural patterns of each community and to
sponsor and support all action aimed at improving the living and working standards
of the people, especially those of lesser means. To this end, it was proposed to
experiment with planned management models for non-damaging productive activities, such as intensive agriculture on small plots of land, methodical livestock management, forestry development, provision of tourist services, handicrafts, etc. In turn, this management fulfills the conservation objectives of the protected unit by permitting the recovery of areas that are degraded at the present time.

**Agricultural and livestock management activities**

In order to reverse soil and pasture degradation, projects to plant animal forage and vegetable gardens were initiated on lands in the Curruhuinca, Cañicul and Aigo communities, with advice from the Provincial Agriculture and Livestock Delegation of Junín de los Andes. The project implemented with the Aigo community at Aucachoroy illustrates an experiment of planned management in a protected area. These people occupy an area of approximately 150 ha. Their chief economic activity is livestock-raising, particularly extensive sheep grazing, which provides them with mere subsistence. The planting of forage and vegetable gardens was a basic necessity for the community. The project, funded since 1989 by Crear - Fundación para el Autodesarrollo (Foundation for Self Development), an Argentine non-governmental organization, helped all the families, but priority was given to the 20 most needy families. The first stage of the project included fencing each family’s land (0.5 ha), which was carried out by each family group. In spring, the land was prepared with natural fertilizer; forage and vegetables were sown and a small network of irrigation channels was installed. Several families divided the forage section with oats and alfalfa in two so as to rotate the use of the lots and thus obtain a more effective recovery of the over-grazed and compacted soil. The horticultural species planted (mainly beans, peas, lettuce, spinach, cabbage, carrots, beetroot, and onions) would enable them to diversify their diet.

For budgetary reasons, only forage and horticultural seeds were purchased in 1990. Although it was not possible to provide them with fencing, the majority of the families extended their forage areas (from 0.5 ha to 1 ha) and their vegetable gardens (from 50 to 80 m²) with sticks or canes, thus indicating their motivation for further improvement. They also planted poplars and fruit trees.

In a short time, the project achieved reduction of the grazing pressure in the winter pasture zone, which showed the most critical state of degradation, and at the same time improved the diet of community members. For the next stage of the project, each family was asked to experiment with a small seed-bed, and it was also suggested that they should construct little greenhouses, which would be very useful in this cold region since they would enable the families to have two vegetable crops a year. The expansion of the project provides for the construction of a sheep bath to improve the animals’ sanitary conditions (Crear, 1988).

An evaluation of the first stage is at present being made together with the community. This process will be completed after a series of surveys of the region’s natural resources in order to plan other agricultural and livestock options.
Alternative production activities

Although the predominant activity of the Mapuche communities continues to be livestock-grazing, alternative non-damaging economic alternatives were successfully introduced, such as fruit-growing, tourism development and forestry. Generally speaking, the individual manner in which the Mapuche carry out their tasks is a typical feature of these communities. This deeply-rooted pattern sometimes becomes an obstacle to community work in the development of projects.

Fruit growing. This aims at diversifying the traditional agricultural activities through appropriate exploitation of resources (fine fruit: raspberries, strawberries, gooseberries, cherries, and regional fruits: elderberries, dog rose, michay, etc.) A raspberry production project was carried out with four families from the Curruhuinca community at Trompul. In the first stage of the project, the families fenced and planted four lots of 0.5 ha each on an individual basis. The raspberries were marketed on a group basis both as fresh fruit and as fruit pulp for confectionery, ice-cream and candy manufacture. Projects are presently being prepared for making preserves, jellies, juices, etc. This will serve to increase the income of the four families involved, by generating a stable source of employment and expanding the structure of their traditional economic activities. To this end two of the beneficiaries took a course in fruit-preserving at the Agrotechnical Center in San Martín de los Andes. They are presently finishing the espaliers for the plants, and are also building a small cooperative for marketing the local products and preparing the preserves.

Tourism development. Due to the great beauty of the landscapes, the areas where the Mapuche communities live attract a considerable number of tourists. With a view to creating an additional source of employment for the 22 families in the Cañical community, in 1988 the National Parks Administration granted them the concession of the Raquituc camping site on the north shore of Lake Huechulafquén. The toilets were repaired by the community with a subsidy from the Secretariat for Social Action (Subsecretaría de Acción Social) of the Neuquén Province. At the same time, the community improved the site, installing tables, benches and cooking stoves, and restoring the caretaker’s house and the kiosk, where local products can be sold, such as bread, cheese and preserves, as well as the typical handicrafts made by the Mapuche families. Tourist activities, although seasonal in nature, generate additional income for the benefit of all the local community (Acción Social de la Provincia de Neuquén, 1987).

Forestry. With a view to diversifying their sources of income, some families of the Curruhuinca community in Quila-Quina and Pil-Pil decided to exploit their abundant timber resources and install a sawmill. The community had succeeded in obtaining from the National Parks Administration legal title to the 11,500 ha they
occupy as community property. This area is covered mainly by forests of evergreen false beech and colihue cane. Management of the project is based on a sustainable use of the timber resource, by reforesting as logging is carried out in successive cycles. This makes it essential to prepare a forestry regulation plan based on a technical survey of the species to be exploited. At present, the project is in this stage.

The settlers are also included in the general policy of the sustainable resource use program although planned management actions up to now have not been carried out with them, as a group, but rather with each of them individually. The obstacles to working as a group stem from their lack of organization, and thus they have to be treated case by case. Generally speaking, the aim is to evaluate the area they occupy in regards to its suitability for intensive livestock-grazing. The cultivation of forage and family vegetable gardens will be implemented where the lots are enclosed by wire fences. Due to the great number of tourists who visit the Park, another productive option (already implemented in some cases) is tourism, through the installation of camp sites in areas to be determined on a joint basis. It should be emphasized that livestock and tourist management activities are never imposed, but initiated only on the base of mutual consent.

Conclusion

The planned management of a protected area aims at the recovery of its natural resources. The agricultural and livestock projects carried out with the Mapuche communities made it possible to reduce the damaging impact of extensive grazing in the winter pasture areas and produce fodder reserves for better animal feeding. Forage production will reduce the pressure on the seeds of the pehuén or araucaria (Araucaria araucana). Apart from the animals, the other large consumer of these seeds is the local community, whose members collect them from February until the first snowfalls in May. The creation of vegetable gardens will thus additionally reduce the pressure on the seeds and lead to the regeneration of the forest.

In the medium term, the recovery of the natural resources will make it possible to guarantee improvement of the socio-economic situation of the communities. However, planned management has already produced some changes in the traditional production patterns of the Mapuches:
- The agricultural and livestock projects were based on the division of the family lands into lots for forage and vegetables, thus making semi-intensive instead of extensive use of the area. This was a substantial change in the Mapuche productive organization, as well as the innovation of intensively planting forage for their animals.
- Another important change in the families' socio-cultural pattern was the introduction of the different food items from the vegetable gardens. Some of the vegetables are dried and preserved for the winter time, using simple domestic methods.

- The development of economic alternatives, such as fine fruit cultivation, tourism, or forestry, introduced practices into the traditional production pattern. The changes resulting from the integrated management projects also became visually evident through the erection of wire fences. Although the land is still considered as belonging to the community, the question arises whether this physical division of the property will change their concept of land ownership on the long run, or foster the creation of minifundios.

  These changes, however, were not imposed on the communities, they arose of their own free will. Indeed, the communities played a leading part in all the management projects, from formulation to execution, and this is a basic management criterion in planning development programs. However, on projecting such programs in the medium term, other structural changes appear. For example, a reduction in the number of migrating laborers can be expected, as local activities will absorb their working force and thus reduce emigration trends. In the longer term, this process, together with the improved socio-economic and sanitary health conditions of the communities, is expected to result in an increase in population due to the reduction in the death rate and the emigration current.

  All these transformations will involve technological changes requiring training and financing, and this will produce changes in rural production and in the whole socio-economic organization of the Mapuche communities. This time, however, these changes will be the result, not of a survival strategy, but of determinations of the communities themselves. The decision to implement a project should therefore always be taken by the communities. Moreover, the idea of benefits (that is inherent to any project) carries a socio-cultural load with certain values, and therefore what is regarded as a "benefit" cannot be transferred mechanically from one culture to another. In the joint planning of a management program, therefore, it is essential not only to be familiar with the Mapuche culture but also to respect it in all its manifestations: to respect their decisions is to respect their identity.

**Editorial update:** In 1993, nine years after the project was initiated, a document was prepared to analyze the successes and failures of the management activities, inform about preliminary results, and update action plans and programs. Due to its success, the participative methodology remains unchanged, with the small producers being the true protagonists from the identification of a project, through its execution, to its final evaluation. Since it is essential that the communities and the Park's administration work together closely during the whole process, the Park wardens who have to deal with the people day after day, should possess extraordinary human qualities and teaching skills (pers. com. N. Osidala, 1994).


Consejo de Planificación y Acción de la Provincia del Neuquén (1986): Lineamientos generales de un plan de desarrollo para la comunidad Currúhuinca, Parque Nacional Lanín.


Argentina. Photos 5/6/7: Lanín National Park. The majestic cone of the Lanín Volcano (3,777 m) is the highest peak of the Park, surpassing the other mountains of the area by more than 1,500 m. Apart from regular patrolling duties, the main task of the park rangers lies in working with visitors and local settlers. Ranger stations are located at strategic places.
Argentina. Photos 8/9: The araucaria (Araucaria araucana) was once a common tree in the high Southern Andes. The last remnants of these forests are protected by law in Argentina and Chile. Their seeds are important in the diet of the local Mapuche Indians and their animals. In Lanín National Park, a forage production project seeks to reduce the pressure on this natural resource.


Universidad del Comahue (undated): El trabajo trashumante en la provincia del Neuquén: COPADE.

Bolivia

Inhabitants in protected areas
Maria de Marconi
Susana Donoso de Baixeras

Beni Biosphere Reserve and Biological Station: education and development
Elvira Salinas

Amboró National Park and settlement pressures
Arturo Moscoso V.
Abstract: Bolivia has not yet developed a true protected areas system: the various areas were created without considering overall conservation needs. The 44 areas dealt with in this chapter cover a total of approximately 20 million hectares of protected areas, that is, almost 19% of the country, in different categories and with variable biological values. The first national park was designated in 1939, but sufficient attention has not been given to the management of protected areas as a means to protect and better understand this biological heritage so that it may be of real benefit to the country. Several evaluations of protected areas have been performed since 1979 and the issue of inhabitants was either not considered at all or was analyzed as one of the threats to the parks. In this chapter, the protected areas of Bolivia are evaluated in relation to the presence of inhabitants established in them. The first section indicates some general features of the Bolivian population and describes the Protected Areas System and its state of development. The second section contains an analysis of the issue of inhabitants and protected areas, including the legal aspects, the types of inhabitants, and the activities they carry out in the protected areas.

Situated in the western central part of South America, Bolivia has an estimated area of 1,098,581 km². Due to its great variations in altitude, ranging from 180 m above sea level to over 6,500 m, and its geographical location north of the Tropic of Capricorn, the country possesses a wide variety of landscapes, from eternal snows to tropical zones and from semi-arid and desert-like areas to regions with an annual rainfall of over 5,000 mm. Hence its extraordinary ecological wealth, which is reflected in the wide diversity of vegetation and flora and fauna species.

The first national park was created in 1939. However, implementation of the protected areas as a means of conserving and obtaining better knowledge of the biological heritage, in order to produce real benefits for the country, has not received adequate attention. In several evaluations of protected areas that have been carried out since 1979, the issue of inhabitants either has not been considered at all or has been analyzed among the factors that endanger the parks (Hanagarth / Arce, 1986; Hanagarth / Marconi, 1986; Hanagarth, 1988, Marconi, 1988 and 1989b).

The intention of this paper is to evaluate the protected areas of Bolivia in relation to the presence of inhabitants in these areas. Since in Bolivia not all the designated national parks deserve that denomination according to IUCN standards, the evaluation will focus on those areas that are internationally recognized national parks or protected areas of great biological value.
The Bolivian population

Bolivia has an estimated population of 6,405,100. Of these, 51.3% live in urban areas and 48.7% in rural areas (INE, 1990). Bolivian population growth has been somewhat slow as compared to other Latin American countries, and the country’s population density is presently among the lowest on the continent (5.8 inhabitants per km²). This low population density is due to two factors: the high death rate and emigration.

The annual population growth rate is 2.2%, with urban growth (4.4%) almost four times higher than rural growth (1.2%). This is due to internal migratory currents, particularly from 1952 onwards, and with greater intensity in the 1980s because of the country’s economic crisis. The overall fertility rate is 5 children per woman, with higher rates for the rural areas (6.1 for the rural total), in some cases over 9 children per woman, while the urban rate is between 3.6 and 4.2 children per woman. This high overall fertility rate is both a cause and a result of the fact that the majority of the population is young: the average age is 18.4 and 41% of the population are under 15 years of age (INE, 1990).

Bolivia classifies as one of the Latin American countries with the highest infant mortality rates: 102 per thousand of live births in the first year of life. The majority of the infant population is under-nourished; 41% of children under five suffer from some kind of malnutrition (34% in the country’s urban areas and 47% in the rural areas); 65% of deaths are of children under five. The chief causes of this mortality are the diseases typical of poverty: acute respiratory infections, diarrhea, gastro-enteritis, infectious diseases and, as an associated cause, malnutrition.

Several of these problems could be controlled by implementing relatively simple preventive medicine programs, with emphasis on mass vaccination campaigns, infantile rehydration and parasite removal programs. According to data supplied by the Social Welfare and Public Health Ministry, 30% of the population have no access to any kind of health services, especially in rural areas, where health services are practically non-existent.

The changes that have taken place in Bolivian society since 1952 have enabled many of the inhabitants of rural areas to have access to certain basic services, including education, as evidenced by the drop in the illiteracy rate to 19.6% in 1988. Nevertheless, functional illiteracy still persists, with its negative influence on the living standards of the population involved, including the high drop-out rate in the schools and the growing deterioration of the system. The illiteracy rate also impedes access to numerous productive, cultural and recreational activities.

According to the 1988 National Population and Housing Survey (INE, 1990) the average Bolivian household has 4.6 members. The deficit of services and facilities is more acute in the rural than in urban areas, resulting in minimal housing and health conditions and thus contributing to the exodus of rural dwellers to the cities. 69% of the rural households have no piped-in water supply (11% in the cities), 85% have no toilets, and 73% have no electric power.
Population distribution by ecological zones shows a marked distortion in the relationship between man and space. Almost 50% of the population live in the “altiplano”, or high plateau region, which accounts for 27% of the Bolivian territory; 27% of the population live in the valleys, while the plains, which cover 59% of the country, are the home of only 23% of Bolivians.

The limited road and rail infrastructure increases this regional imbalance. Interconnection between the altiplano, valleys and plains is minimal, while interconnection with rural areas is mainly made to exploit natural resources, with no thought of renovation or rational occupation of the land. The result is a disjointed regional growth pattern, with neglected areas characterized by low densities of capital, inadequate levels of physical infrastructure and basic services, per capita incomes below the national average, demographical expulsion and negative migratory balances.

There are three large groups of the rural population that are particularly associated with the protected areas: the farmers of the Andean region, the settlers, and the indigenous groups in the east of the country.

The farmers of the Andean region

The Andean region of the country (altiplano and valleys) is inhabited mainly by the Quechua and Aymara peoples, along with other smaller groups such as the Urus and Chipayas. The Quechus are the largest Bolivian native group; there are over 1.5 million Quechua farmers in the country, living mainly in the valleys of the Cochabamba, Chuquisaca and Potosi Departments and, in smaller numbers, in Oruro and La Paz.

The Aymaras are the oldest population group in Bolivia. There are more than 1 million of them, and their territory is the altiplano of La Paz and Oruro and some regions of Potosi. The Aymaras were conquered by the Quechus in the fourteenth century, almost a century before the Spanish conquest, and the cultures of the two peoples have combined to a great extent and are now very similar. The Aymara and Quechua peoples have considerable contact with the more Hispanic and Creole cultures, and their customs have therefore taken on certain western traits.

The Aymaras and Quechuas that remain in the rural areas produce food for the cities; they generate between 70 and 75% of the national production of goods for immediate consumption. Their social organization is based on communities, whose authority is the Jilancu or Jilacata. The communities are grouped in ayllus (villages), which have an authority, the Malku or Curaca, a deeply-rooted democratic system through which all the adult male members of a community must take turns in positions of authority. The traditional organization system has been modified by constant contact with Western culture, and there are now no villages that still follow the purely traditional ways; instead, the traditional organization is combined with a modern one: the trade union. These groups also take part in
### Table 1

<table>
<thead>
<tr>
<th>No. on Conservation Map</th>
<th>Conservation Units</th>
<th>Location (Department)</th>
<th>Area in ha</th>
<th>Year created</th>
<th>IUCN Equiv.</th>
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<td>1979</td>
<td>II + VIII</td>
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<tr>
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<td>1988</td>
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<td>29</td>
<td>El Dorado</td>
<td>La Paz</td>
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<td>30</td>
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<td>Bella Vista</td>
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<td>Iténez</td>
<td>Beni</td>
<td>1,500,000</td>
<td>1988</td>
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</table>
Settlers

Over the last thirty years, some 150,000 families have established in new settlement zones. These settlers, who represent some 750,000 people and 20% of the country's rural population, are distributed chiefly in the tropical regions of three departments: Santa Cruz, Cochabamba and La Paz, although there are also recent settlement zones in the Beni and Pando Departments. The population of these settlement zones has increased enormously in the last ten years due to the expansion of coca cultivation in the La Paz and Cochabamba Departments. The population of Chapare Tropical in this latter department has increased fivefold between 1978 and 1988 (Blanes, 1989).

The settlers have attained higher income and living standards as compared to the poorer sectors of the traditional farmers with parcelled lands. As an economic sector, however, they have not been able to overcome the conditions of poverty typical of the majority of farmers. Only coca-growers have increased incomes, but this does not necessarily mean improved living standards, since the consumption level and the cost of living in such areas often account for a large proportion of the income from coca leaf production. The infrastructure of basic services in these areas has not improved, and even tends to deteriorate rapidly due to new immigrant pressures. The settlement zones in general are affected by problems that arise because of the difficulties experienced by immigrants in adjusting to their new surroundings.

Table 1 (cont.)

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Conservation Units</th>
<th>Location (Department)</th>
<th>Area in ha</th>
<th>Year created</th>
<th>IUCN Equiv.</th>
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<td>42</td>
<td>Quinera del Aten</td>
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<td>43</td>
<td>Chumunes</td>
<td>Beni</td>
<td>804,000</td>
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<tr>
<td>44</td>
<td>Bajo Paragua</td>
<td>Santa Cruz</td>
<td>1,388,200</td>
<td>1988</td>
<td>VIII</td>
</tr>
</tbody>
</table>

(*): Area subject to analysis of inhabitants status.

n/d: No data.

?: Approximate category equivalent, insufficient information.

national life and therefore also obey the authorities of the country's political system. Ownership of the land is usually individual, although some communities still maintain the collective system or, as in most cases, a plot of land for collective use.
Inhabitants in protected areas of Bolivia

Involving misuse of existing natural resources, lack of basic services and infrastructure, and inadequate marketing of their produce. Each settlement zone also has its own particular features, for example:

- In Santa Cruz, the settlements are older and therefore more stable. Their main difficulties reside in the areas of soil deterioration and lack of technology;
- In Chapare, the proximity to the city of Cochabamba and the new Cochabamba-Santa Cruz highway, which crosses the region, represent great advantages compared to other regions, particularly that of La Paz. However, secondary road conditions are extremely bad, and the climatic conditions are possibly the worst in the country, due to the high rainfall;
- The difficulty of access to the lower settlement zones of the La Paz, Beni, and Northern Yungas Departments, and the fact that some of these are of very recent origin, makes this a critical zone today. The existing infrastructure is very far away from the present settlements, and the new villages are the farthest from the supply and marketing centers in all the settlements. Compared to the other regions, this is the one with the worst conditions.

The indigenous peoples of the eastern region

The designation “indigenous peoples of the eastern region” applies in general to all the native inhabitants of the lowlands or the plains. These groups are referred to in Bolivian legislation as “marginal ethnic groups” or “jungle dwellers”. It is estimated that there are between 130,000 and 200,000 indigenous people living in Bolivia in around 38 different ethnic groups, which means, approximately 5% of the Bolivian rural population (Plaza et al., 1985). This population is located in the country’s tropical plains in the Santa Cruz, Beni and Pando Departments, and the tropical regions of La Paz, Cochabamba, Chuquisaca and Tarija.

The indigenous peoples are ethnic groups with a tribal organization; nearly all of them are itinerant peoples, with their own language, social organization and culture. Their cultures are often similar, however, depending on their ecological zone and mutual proximity. According to classical parameters, their living standards are among the lowest in the country, since they do not generally have access to any basic education or health services and their levels of malnutrition, illiteracy, mortality, and others are well above the national averages.

Their economic activities are based on gathering, hunting, and fishing, although some engage in shifting cultivation. In general, these activities are carried out in more or less defined territories for each group. Land ownership is collective by common law, although in most cases it is not legally established, and this causes constant problems with other population groups such as settlers, loggers, traders, etc. They rarely establish trading relations with other groups and are self-sufficient in production and consumption.
The protected area system

According to Ormazabal (1988), a national system of protected areas (Sistema Nacional de Áreas Protegidas, SNAP) may be defined as "a set of conservation units which, related to each other in an orderly manner and through their protection and management, help to attain certain conservation objectives." Moreover, if we think of conservation as "the management of natural resources and their use for development", a national system of protected areas can become a valuable tool for achieving sustainable development.

In the light of these concepts, Bolivia has not yet developed a true protected areas system. The various areas were created without taking into account the conservation requirements or preexistent areas. As a result, the areas presently designated do not cover all the country's biological heritage or the conservation objectives for sustainable development.

Designated areas

Bolivia is probably one of the few countries that possess no clear categorization of protected areas, either in legal provisions or in other official documents. As a result, the studies that have been carried out on this subject list the protected areas according to the author's own criteria, and in many cases there are differences of opinion, particularly as regards the inclusion of forested areas and others whose objectives are not directly related to the preservation of biodiversity.

Considering that the main objective of forest reserves is timber production, they can nevertheless contribute to the conservation of biodiversity (Marconi/Morales, 1990), and, like the areas assigned to regulation of watersheds, they are equivalent to IUCN Category VIII. They will therefore be included in this general evaluation.

Eight areas that have been legally designated present problems in their evaluation, either because they do not correspond to internationally recognized criteria (Mirikiri, Mallasa, Las Barrancas, Alalay y Angostura, and Chiquitana) or because they are areas with no specific geographical limits, covering widely dispersed natural communities such as the Beni and Pando lagoons and the country's Alder Forests, thus making it difficult to evaluate the associated human populations; and lastly, the Cerro Tapilla Reserve, whose exact location on the map is unknown. Protected areas created in recent years at regional level have been excluded from the present analysis.

Table 1 shows the complete list of areas under some type of legal protection in Bolivia, grouped according to management categories (as identified by Marconi 1989a). There is a total of 44 areas designated at the national level. Nine areas, consisting of 5 national parks (parque nacional), 1 biological station (estación biológica) and 3 national reserves (reserva nacional), have been selected based on their significance for the preservation of representative samples of the country's ecological diversity. These areas will be the subject of more detailed evaluation as to the situation of their inhabitants.
<table>
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<tr>
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<td>Indirect</td>
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<tr>
<td></td>
<td>Independent</td>
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</tbody>
</table>

Table 2: Bolivia: administration and implementation status of protected areas (1991)

- CDF - Dependence: 0 = No dependence, 1 = Direct dependence, 2 = Indirect dependence, 3 = Independent
- Management: 0 = None, 1 = Being planned, 2 = Incipient, 3 = Fair or good

Note: 4 = More than one CDF involved.

7: No information exists, probable classification; 1, 2, 3: see text for detailed explanation.
X: The CDF should collaborate with the owner but does not do so; owner implements some protection.
*: Forestry concessions have been allocated without the management plans required by Law.
The review of the legal framework of the protected areas system performed by Marconi (1989a) reveals that there are 11 categories of protected areas, the majority of which have ambiguous definitions. Thus, the designation assigned to an area on its creation often does not represent the correct category and there are no specific criteria for changing categories. This is the reason for the differences in the equivalents of the IUCN categories (see Table 1). The fact that there are areas with incorrect equivalents reflects the low level of information available on such areas.

The total area under protection in the country is not equal to the sum of the individual protected areas, since many areas overlap. The estimated total area of the 44 protected areas under consideration is 20 million hectares, that is, almost 19% of the territory, in different categories and with variable biological values. Map 1 shows the areas with the number assigned to them in the list.

Degree of system development

The entire Protected Area System should be administered by the Forestry Development Center (Centro de Desarrollo Forestal, CDF), a branch of the Ministry of Agricultural Affairs (Ministerio de Asuntos Campesinos y Agropecuarios, MACA). Under current legislation, the direct administration of the areas may be shared or delegated to other institutions, subject to CDF supervision. Since 1984 there has been growing interest in institutions unrelated to the CDF for implementation of real protection measures and the establishment of appropriate administration units for the protected areas. An evaluation of the creation provisions of the various designated areas according to their degree of dependence on the CDF shows three situations (see Table 2):

- Direct administration: in the hands of the CDF; in recently-created areas, it may refer to CDF's decentralized regional units. In the case of Wildlife Refuges (Refugio de Vida Silvestre, marked with an X in Table 2) responsibility is shared with the owner.
- Indirect administration: the CDF delegates the responsibility for direct administration to public agencies such as the Regional Development Corporations (Corporación Regional de Desarrollo), or to a private institution (NGO), which it supervises.
- Independent administration: areas designated subsequent to the Forestry Law (Ley Forestal), where the administration is explicitly entrusted to institutions other than the CDF.

Of the 44 areas included, the majority (31) are under the CDF's direct responsibility and 9 have been entrusted to other institutions (indirect). Four areas fall into the third category (independent administration), a situation not provided for by law: The Beni Biological Station is the responsibility of the National Academy of Science (Academia Nacional de Ciencias). Two other areas, Carrasco Ichilo National Park and Sajta Ichilo Permanent Protection Forest, have been declared within a pro-
Inhabitants in protected areas of Bolivia

To evaluate the degree of development of the Protected Area System, four levels of management effectiveness have been established (see Table 2):

0 = None: this refers to areas where no management activities have been carried out;
areas marked with an asterisk (*) are forests in production, in which concessions have been allocated despite the lack of management plans required by law.

1 = Being planned: these are areas where management activities have only been planned.

2 = Incipient: the area has a minimal budget and some type of administration or control that guarantees at least basic protection. Areas under private ownership have been identified with an X.

3 = Fair or good: the area is managed to a reasonable degree, possesses personnel, budget, work programs or management plans, etc.

Twenty of the Bolivian protected areas have no administration at all, in nine areas management is being planned, twelve areas have an incipient degree of implementation, and three areas have fair or good administration. If we consider only the areas under direct administration by the CDF, we note that 19 of the 20 areas without any management belong to this category, representing more than 60% of the total administered by CDF. Of the remaining areas, 4 are in a planning stage, 3 have incipient administration and one has a rather good management. However, the degree of development of these 8 areas depends in 4 cases on initiatives unrelated to the CDF and the others are under the responsibility of the decentralized units of Santa Cruz (3) and Tarija (1). These figures underscore the CDF’s limited capacity for managing the protected areas directly, due mainly to the lack of the necessary human and financial resources. In recent years, decentralization processes on the one hand and cooperation with non-governmental institutions on the other have made it possible to develop some areas, and at the present rate of progress the situation may well change radically within a short time.

The Bolivian Network of National Parks, Other Protected Areas, and Wildlife (Red Boliviana de Parques Nacionales, Otras Areas Protegidas, Flora y Fauna Silvestres) has been engaged in a follow-up of the System since 1989 and has prepared a proposal for an institutional framework for its administration in which all the public and private institutions involved will participate.

Legal framework: protected areas and inhabitants

The principal components of the System’s legal framework are the General Forestry Law (Ley General Forestal de la Nación), authorized by Decree-Law 11,686 in 1974, and the Wildlife, National Parks, Hunting, and Fishing Law (Ley de
Vida Silvestre, Parques Nacionales, Caza y Pesca, LVSPN), authorized by Decree-Law 12,301 in 1975. A general evaluation made by Marconi (1989a) showed that this framework is incomplete and that basically it lacks a clear conceptual outline giving specific definitions and objectives for the System in general. Also, its wording is very vague, and this causes confusion in its application. This evaluation will place emphasis on the way the issue of land tenure and human occupancy is addressed.

Land tenure and human occupancy in the legal framework

The Wildlife Law provides for declaration of protected areas on both publicly and privately owned lands, without specifying limitations for any management category. The Forestry Law devotes special attention to the ownership of forests, and indicates that land tenure will be established in natural forests after their classification. However, the lack of definition of the management categories results in vague regulations on land tenure and human activities permitted or prohibited in each of the categories. As regards land ownership, an analysis of the provisions for the creation of protected areas shows three different situations (see Table 3):

- Areas that are the property of the State: In those that have inhabitants, there may be expropriation of land or modification of boundaries so as to exclude private property.
- Mixed ownership areas: Inhabitants are subject to special regulations. This refers to native inhabitants or settlers established prior to the declaration of the area.
- Privately-owned areas: In cases of private property, protected area declaration does not affect the ownership status.

A more detailed analysis of the provisions contained in the declaration of each protected area with respect to human presence and ownership rights shows six different situations (see Table 3):

- No provisions: in the declaration of several areas no reference is made to land tenure or human occupancy (6 areas).
- Prohibition of settlement and land grants: all types of human occupancy and land grants or concessions are prohibited (19 areas). These provisions do not always contain rules regarding the status of inhabitants already present.
- Regulation of human occupancy: in areas where there are inhabitants, they must comply with any official regulations and carry out their activities in a manner that does not affect the area’s objectives (16 areas). In such cases it can be inferred that preexisting private-property and mixed-ownership areas will be respected. Not all areas with inhabitants have this clause.
- Reversion of land grants and concessions: areas where all forestry or other concessions are revoked (8 areas). Some include the possibility of expropriation by the State.
- Respect for private property: in the four refuges that include private cattle ranches, it is clearly stated that the declaration of the protected area does not
### Table 3

**Bolivia: human presence in protected areas (1991)**

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>PROTECTED AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land ownership</strong></td>
<td>State</td>
</tr>
<tr>
<td>Reference in legal framework</td>
<td>None</td>
</tr>
<tr>
<td>Inhabitants</td>
<td>Original inhabitants</td>
</tr>
</tbody>
</table>

(1) Indicates what the legal framework provides, although this does not always reflect reality. (7) Uncertain. * Indigenous territories with recognized ownership.
affect their status as private property. In only one case with native inhabitants is it indicated that the community will receive “special treatment” (Llika).

Respect for occupancy by indigenous inhabitants: the presence of “jungle-dwelling groups” in the protected area is accepted, although they are not considered owners of the land, except in those areas that have been declared totally or partially indigenous territories (marked with an asterisk (*) in Table 3).

To summarize, the issue of land rights and regulation of the activities permitted and prohibited in protected areas does not exhibit any clear or coherent principles. In the case of cattle ranches, private ownership is clearly recognized, whereas the land tenure of existing inhabitants, in almost all cases, is implicit only in the regulation of their occupancy, which could give rise to differences of interpretation.

**Land rights of rural inhabitants**

The land rights of the rural inhabitants, particularly those of traditional and indigenous communities, have received considerable attention in Bolivia. Since the agrarian reform (1953), attention has been focused on the native inhabitants of the Andean zone and, in recent years, on the indigenous peoples of the eastern region. In the second half of the last century and in the early years of the present century, a “land appropriation” process took place in the indigenous communities of the Andean region, resulting in the establishment of large estates in which the indigenous and mestizo farmers held plots of land and were forced to serve land-lords under slave-like conditions.

The agrarian reform introduced in 1953 aimed at restoring land rights to these farmers and consolidating those of the communities by granting comunal land titles. The State Constitution (Constitución Política del Estado, approved in 1967) ratifies the principles of the agrarian reform by stating that “land is the original domain of the Nation, and it is for the State to distribute, regroup and redistribute agrarian property in accordance with economic and rural development needs, guaranteeing the existence of community, cooperative and private properties. Labor is the basic source of acquisition and conservation of agrarian property and the farmers are entitled to land allotments.”

Ten years after the agrarian reform, more attention began to be paid to agricultural settlement. The Settlement Law (Ley de Colonización) of 1966 provides that “settlement is the process of occupation of uncultivated or under-exploited lands through the migration of Bolivian citizens or foreign nationals, for the rational exploitation and development of such regions.”

The Agrarian Reform Law (Ley de Reforma Agraria) established the need to protect, preserve and make rational use of renewable natural resources, but left more detailed rules to specific laws. Five months later, a law was passed setting up general rules for the protection and exploitation of such resources, particularly in state-owned lands, but no mention was made of areas where people were already living.
<table>
<thead>
<tr>
<th>Bajo Paragua</th>
<th>Chimanes</th>
<th>Quinera del Aten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosques de Aliso</td>
<td>Guarayos</td>
<td>El Chorí</td>
</tr>
<tr>
<td>Ichique</td>
<td>Convendo</td>
<td>Río Bonpi</td>
</tr>
<tr>
<td>Río Grande</td>
<td>Masiuri</td>
<td>Chiquitania</td>
</tr>
<tr>
<td>Suá Ixchel</td>
<td>Bella Vista</td>
<td></td>
</tr>
<tr>
<td>Cavernas</td>
<td>El Repechón</td>
<td>P. Machacado Vizcarrá</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>El Dorado</th>
<th>Est. Elsner San Rafael</th>
<th>Est. Elsner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huancaroma</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cordillera de Sama</th>
<th>Ríos Blanco y Negro</th>
<th>Tariquía</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noel Kempff Mercado</td>
<td>Yura</td>
<td>Maturípí Heath</td>
</tr>
<tr>
<td>Eduardo Avendaño</td>
<td>Ulla Ulla</td>
<td>Lag. de Bení y Pando</td>
</tr>
<tr>
<td>Lag. Alalay y Angostura</td>
<td>Cerro Tapilla</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>del Bení</th>
<th>Lía</th>
<th>Tontor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Cruz la Vieja</td>
<td>Carrasco Ichílo</td>
<td>Noel Kempff Mercado</td>
</tr>
<tr>
<td>Amboro</td>
<td>Las Barrancas</td>
<td>Isiboro Sécure</td>
</tr>
<tr>
<td>Tunari</td>
<td>Mallasa</td>
<td>Mirikiri</td>
</tr>
<tr>
<td>Turi Condoriri</td>
<td>Sajama</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Bolivia: human activities in protected areas (1991)

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>Traditional agriculture</th>
<th>Agriculture with plantations</th>
<th>Subsistence livestock grazing</th>
<th>Commercial livestock grazing</th>
<th>Firewood extraction</th>
<th>Hunting and fishing</th>
<th>Commercial hunting</th>
<th>Tourism and recreation</th>
<th>Road construction</th>
<th>Mining</th>
<th>Power generation</th>
<th>Potable water production</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- 0: Activity confirmed but extent or legality unknown
- P: Proposed activity
- U: Uncertain
The Settlement Law contains more explicit rules regarding nature conservation. It states that “in settlement zones, the National Settlement Institute (Instituto Nacional de Colonización, INC) shall see to the conservation and rational use of natural resources. All forests that have a protective function because of their location shall be conserved, whether that function is a factor in regulating water-courses, protecting communication routes, or a determining factor in soil conservation. When spontaneous settlement in inappropriate areas causes the destruction of natural resources or soil erosion, the INC will promote the movement of the settlers to other areas with more suitable conditions.”

Indigenous territories

The issue of indigenous territories is of particular importance because of their close relationship to protected areas. Until recent years, no special attention was paid to the problem of land tenure for the indigenous people in the eastern part of the country, despite the existence of some very general provisions instructing certain government agencies to take action on this issue. The Agrarian Reform Law recognizes the “jungle settlements” (reducciones selvícolas) as a type of rural organization and establishes that the indigenous groups that inhabit the tropical and subtropical plains, who live in an “uncivilized state and have only a primitive type of organization”, shall remain under government protection. In these indigenous communities, collective and private property is inalienable. The Settlement Law provides that the INC shall afford protection to indigenous groups established in settlement zones and that when defining the limits of the land allocated to settlers it shall fully respect areas that are under group or individual exploitation by these ethnic groups. The General Forestry Law declares that the Forestry Development Center shall delimit areas of the country appropriate for the survival of the jungle tribes, guaranteeing and protecting their sources of hunting and fishing.

Based on these provisions and in response to the claims of the indigenous peoples, four decrees regarding indigenous territories were approved in September 1990. The general provisions of these decrees are as follows:

- The Chimanes Region is declared an Indigenous Area (Area Indígena), with 3 types of zones: protection, indigenous territory and commercial exploitation zones. Where an indigenous territory and a protection zone overlap the area will be dual in nature. It is also specified that previously established ownership rights will be regulated.

- The areas of Ibiato and Monte San Pablo are recognized as Indigenous Territories of the Sirionó People and declared Indigenous Protected Areas (Area Protegida Indígena).

- Isiboro Sécure National Park is recognized as Indigenous Territory of the Mojeño, Yuracaré and Chimán peoples, who have lived there for generations. It
will now be called "Isiboro-Sécure National Park Indigenous Territory" (Territorio Indigena Parque Nacional Isiboro-Sécure). This area also retains its dual nature of both indigenous territory and national park.

In addition, these provisions establish the "inalienable, indivisible and unseizable" character of the indigenous territories recognized as collective property. A committee was formed to draft a proposal for a Law of Indigenous People (Ley de los Pueblos Indígenas).

With these measures, community territorial rights are established for the first time, along with the principle that the designation of protected areas is not incompatible with these rights. No mention is made, however, of the responsibilities and duties of either the indigenous peoples or the CDF in the administration of the areas with dual status.

**Human presence in protected areas**

The inhabitants of protected areas have been classified into nine groups, as follows (see Table 3):

- **Original inhabitants**: those who have always lived in the areas, or at least for the last 50 years.
- **Former estate dwellers**: inhabitants in the Andean region who were granted land as private property under the agrarian reform.
- **Indigenous peoples**: usually forest dwellers, nomadic to a certain extent, who maintain their traditional cultures.
- **Old settlers**: settlers established in the protected area prior to its declaration.
- **New settlers**: those that have moved into the area after declaration, usually as a result of the strong waves of migration that have taken place during the last 30 years.
- **Cattle ranches and other private companies**: reference has been made to the declaration of areas with privately-owned land that is used for livestock-grazing, but there are also other areas where different types of companies have been established.
- **Urban populations**: the designation of extensive protected areas in some cases results in the inclusion of towns.
- **Illegal intruders**: in many areas, there are persons who live outside the protected area and enter it to extract timber and firewood, to hunt, etc.
- **Others**: all occupants not covered by the above categories, for example, military camps.

There are very few protected areas where no human occupancy of any kind has been reported. One example is the Ríos Blanco y Negro Reserve, where several settlements established during the rubber boom have been abandoned. In the case of the Noel Kempff Mercado National Park and National Reserve, the presence of native inhabitants in the region is known, but it is not clearly specified whether they are
actually inside these protected areas. Lastly, only the presence of a military camp has been reported in Santa Cruz La Vieja National Park.

With respect to the Yura, Tariquía and Cordillera de Sama National Reserves (Reserva Nacional), the Río Grande Masicuri Closed Forest Reserve (Reserva Forestal de Inmovilización) and the Quinera del Aten Permanent Production Forest (Bosque Permanente de Producción), there are no reports of inhabitants in these areas and the data in Table 3 have been indicated based on the location of each area.

Human occupancy in all other areas has been confirmed. Although there are inhabitants in nearly all the protected areas, however, their number and the activities they undertake indicate that such occupancy is not always significant. There is very little information regarding the degree of impact caused by human intervention.

**Human activities in protected areas**

Human occupancy and activities in protected areas should be more clearly regulated. In general, existing provisions are restrictive and refer to the prohibition of land grants, settling, hunting, logging, deforestation, etc. In principle, acceptance of human presence implies acceptance of the activities carried out by the inhabitants, although they are rarely referred to. Fourteen different types of economic activities have been identified in protected areas (Table 4):

- **Traditional agriculture.** Subsistence-type agricultural production based on traditional practices, with no strong environmental impact. In some cases there may be marketable production surpluses, but not to any extent that could be considered as commercial agriculture. It may include the development of small scattered farmsteads in the lowland regions.

- **Agriculture with plantations.** Involves deforestation of larger areas per family unit than in the above case, with complete modification of the natural vegetation as well as accelerated deterioration of the soil’s productive capacity. Produces surpluses for the market.

- **Subsistence livestock-grazing.** In the high Andean region, the animals raised are mainly camelids (i.e., llamas and alpacas). In some areas, livestock raising has resulted in great deterioration of soil quality due to overgrazing, especially in the case of sheep. The settlers and the native peoples of the eastern region concentrate on domestic livestock-grazing with only a few animals that provide them with milk, meat, and other products for family consumption.

- **Commercial livestock-grazing.** This usually involves large herds of cattle and a certain degree of overgrazing. Secondary problems are caused by the burning of pasture lands due to the effects this has on the wildlife within the protected areas, especially the refuges.

- **Firewood extraction.** This is a generalized practice among protected area inhabitants, involving native species such as thola, yareta, keñua, and others.
- **Timber exploitation.** In the permanent production forests this is selective, involving a small number of species, and extractive, with no replacement being made. In other areas, timber exploitation is prohibited but is performed illegally.
- **Hunting, gathering, fishing.** The eastern indigenous peoples and other native inhabitants perform legal traditional hunting, fishing, and gathering activities in the forests. Other groups, such as settlers and loggers, practice subsistence hunting and fishing on an illegal basis.
- **Commercial hunting.** This is usually carried out by people who live outside the protected areas. In many cases the wildlife populations decrease in number due to the different types of illegal hunting practices involved.
- **Tourism and recreation.** These are among the objectives for the creation of some protected areas. In several areas private companies promote tourism, which is not planned or controlled by the areas' administrative units. Generally, however, the tourist activities in protected areas are not intensive.
- **Road construction or improvement.** Development of the road infrastructure generally improves access to the areas, thus facilitating some management programs. However, road construction in tropical regions, followed by settlement, requires special measures due to the problems involved. Penetration routes are opened up to production forests for timber extraction.
- **Mining.** not always covered by legal authorizations. The methods used often involve destruction of river banks and cause pollution problems. In some Andean protected areas there are companies authorized to mine metallic or other minerals or exploit existing quarries.
- **Power generation.** There are two areas where power generation is of significance: Tuni Condoriri National Park (provides electricity for La Paz) and the Eduardo Avaroa Reserve (hydroelectric project under study).
- **Drinking-water supply.** The Tuni Condoriri, Tunari and Santa Cruz la Vieja National Parks supply the drinking-water for neighboring cities (La Paz, Cochabamba, and San José de Chiquitos, respectively). However, this factor was not taken into account when the areas were created.
- **Others.** Protected areas situated in distant regions with difficult access may be used for clandestine cocaine manufacture.

### Conclusions

The fact that Bolivia's population is 48.7% rural serves to underline the importance of protected area management that is not only oriented towards the preservation of biodiversity but that also benefits the local population. Many of the rural dwellers have fundamental difficulties in meeting their basic needs. Indeed, the almost complete absence of opportunities for attaining more or less adequate living standards places this population among the poorest in South America, with levels of
extreme poverty in all the social indicators: health, education, basic sanitation services, etc. The country has a total of 44 protected areas declared at national level, which in most cases are not supported by a clear conceptual framework or adequate technical foundations. Moreover, these areas have a very low degree of management, because the Forestry Development Center’s executive capacity is severely limited due to shortage of both funds and qualified technical personnel.

The legal framework of the Protected Areas System addresses the issue of land ownership and inhabitants’ rights in a very superficial manner. The provisions that relate specifically to the declared areas form a rather incoherent whole as far as human presence is concerned. On the other hand, compatibility with other provisions relating to land use and recognition of land rights is not usually considered, thus causing problems due to the overlapping of legally permitted uses in the protected areas. The new Environment Law presently being drafted, provides for a territorial regulation of the country which, if implemented, should furnish a permanent solution to land use planning which is not only based on use capacity but also takes into consideration human settlements, the need to protect the biological heritage, and the distribution of available natural resources.

Human influence is present to a greater or lesser extent in all of the areas, but with different features: In some cases it involves groups of native inhabitants or permanent settlers who lived in the region prior to creation of the protected area; their need to exploit natural resources varies according to their socio-economic characteristics. In other cases, it involves more recent activities arising from the interest in exploiting timber or wildlife resources or clearing new lands for agricultural purposes (colonizations). To a lesser degree it involves road construction, mining, tourism, etc.

The inhabitants’ activities are not always incompatible with conservation objectives, provided they are carried out in areas with appropriate management categories. To achieve this, it is necessary to take into account the needs, expectations and characteristics of the people who inhabit the area and its environs, as well as their participation in area management decisions and the benefits deriving from their implementation.

The action taken to develop a protected area system is still quite recent and the attention devoted to the problems of human presence has not yet reached the desired levels. Thus, although support programs for the local population have indeed been programmed or developed in some areas, such programs have generally been entrusted to technicians who make decisions without consulting the inhabitants. There is now a significant change of attitude in most cases. On the other hand, rural development measures have been planned in some areas without taking into account the existence of the park or reserve, usually due to insufficient knowledge of the role protected areas can play in generating local benefits. Lastly, there is one area (Isiboro-Sécure) whose development will probably depend on the action taken by its inhabitants.
The evaluation of these experiences and the growing interest of the government in the development of the protected areas system, with support from non-governmental organizations, have resulted in great changes in only a few years. The action undertaken encourages the hope that in the future there will be improved prospects for rural populations in protected areas through the implementation of integrated conservation and development programs.

The actions and processes under way in Bolivia that generate optimism regarding the future status of protected areas in general and their inhabitants in particular, include the following: the growing participation of the local population in the planning of some protected areas; the promotion of an institutional organizational structure for the administration and development of the Protected Areas System; the drafting of the Environment Law; the proposed territorial regulation project; the proposal for an Indigenous Peoples' Law; the regulation of the protected areas; and the preparation of the Environmental Action Plan (Plan de Acción Ambiental) for Bolivia with wide participation of the general public.

Editors' note: In the original Spanish edition of this book, detailed descriptions are given on the local populations and administrative situations of the following protected areas: Sajama, Isiboro-Sécure, Amboró, Carrasco Ichilo, and Noel Kempff Mercado National Parks; Bení Biological Station; and Eduardo Avaroa and Manipuri Heath National Reserves. Due to fundamental changes in nature conservation policies in Bolivia in the past three years, the editors chose to instead include an extensive update in form of an additional article, submitted by Dr. Mario Baudoin, Under-Secretary for Environmental Affairs.
Conservation of biological diversity in Bolivia

Mario Baudoin

Abstract: In Bolivia, no protected area had a working administration before 1985. Since then, and especially after the enactment of the Environment Law in 1992, fundamental changes have taken place in the conservation of biodiversity in this Andean country. During a process of administrative restructurings that for the first time permit the holistic treatment of nature conservation and development, the following elements played, and continue to play, an important part for protected areas: the participation of local and especially indigenous people, the strengthening of the administration of high-priority conservation areas, the training of personnel at all levels of the protected areas system, the establishment of environmental education programs, and the funding of the system as a whole, as well as each protected area with its participative management programs.

To understand the magnitude of the changes that have taken place in Bolivia in the past three years, it is necessary to briefly consider the principal characteristics of the situation of protected area management prior to 1992. Even though it could be said that there has been a qualitative improvement in the situation, a number of problems have remained and some have just begun to be expressed. At present, we are in a crucial stage that will define conservation for years to come.

The situation prior to 1992

Even though the first protected area of Bolivia was created in 1939 (Parque Nacional Sajama), no area in the country had a working administration before 1985. This was when a group of Bolivian biologists from the Institute for Ecology (Instituto de Ecología, IE), with scientists from The Nature Conservancy (TNC), visited the “Estación Biológica del Beni” in order to consider the purchase of the “Estancia El Porvenir” with the support of TNC. This purchase was intended to be the first step in establishing an operations center and a working administration for the Reserve, which was under management of the National Academy of Sciences (Academia Nacional de Ciencias de Bolivia, ANCB).

At the time, the general management of protected areas in the country was legally under the Center for Forestry Development (Centro de Desarrollo Forestal, CDF). Until 1992, the CDF had not assumed this responsibility in any way, except for in the Department of Santa Cruz, where the Parks and Wildlife Division had
hired some biologists and where the murder of Prof. Noel Kempff Mercado had created strong public support for conservation. The CDF had functioned primarily as an agency for receiving revenues from the timber industry. Because of its total dependence on these incomes, the CDF never fostered real forest management and simply gave permits based on the extractive and processing capacity of the lumber companies. In this scheme of things, there was very little room for management of protected areas or wildlife. Adequate legal instruments were not established, nor were sufficient financial resources allocated for the management of these areas, most of which had been created through the good will of legislators that had very little experience in the problems of protected area management. As a result of this situation, it became “easy” to create parks that never created much conflict, because of their lack of effectiveness.

Another consequence of the ineffectiveness of CDF was that the areas that had developed some sort of administration by 1992 functioned independently of one another. Under these conditions, a protected area system with coherent management policies never developed, and the greatly needed regulations for the 1974 Wildlife and Parks Law were never enacted. Park guards acted under the umbrella of authority given by the Forestry Law, which had been designed for the fostering of the timber industry.

Up to 1992, the question of participation of local or indigenous peoples in protected area management had not even been raised. As in many other regions of the world, the model of national parks without people had been accepted in conceptual terms by most Bolivian conservationists. This vision led to the conflicts described in this volume by Arturo Moscoso for the first years of management in Amboró National Park. It has continued to create unnecessary conflicts in Bolivian conservation and is justly opposed by people that see the dire situation of Bolivian farmers and indigenous peoples, and who suppose that this conflictive view is shared by all conservationists.

One of the main problems for biodiversity conservation in Bolivia has been the small number of people adequately trained in this field. The school of forestry in Tarija and the one in Cochabamba (ETSFOR) were clearly oriented in the same line as the Forestry Law, fostering the large timber industry, and in the case of Tarija, clearly stressing plantations, though with little success. The first Biology Department in a Bolivian university was created at the Universidad Mayor de San Andrés (UMSA) in 1978, and was at first greatly influenced by professionals from the health sciences with little knowledge of either botany or zoology. This and the impact of military regimes on the universities resulted in a great delay in the training of the necessary human resources for biodiversity conservation.

Nevertheless, many of the people that have contributed in this field have been at one time or another related to the Department of Biology and the Institute for Ecology of the UMSA. Another important factor has been the work of Prof. Noel Kempff Mercado in Santa Cruz, who, through his work at the zoological park and
Conservation of biological diversity in Bolivia

botanical garden and in urban landscaping, contributed to the creation of a widespread appreciation for Nature, which is not equaled in any other large city in the country. His death (he was assassinated while visiting the area of what is now Noel Kempff Mercado National Park) had a great impact on public opinion in the region and created additional support for protected areas.

Developments after 1992

The Environment Law (Ley 1333 del Medio Ambiente) was enacted in June 1992, which empowered the National Environment Office (Secretaría Nacional del Medio Ambiente, SENMA) to administer the protected areas. Getting prepared for this task, SENMA created a National Administration for Protected Areas and Wildlife (Dirección Nacional de Areas Protegidas y Vida Silvestre, DNAPVS) in November 1991. Financial and technical support from the Global Environmental Facility (GEF) and the Swiss Government permitted that for the first time the Bolivian government would systematically develop a national system of protected areas (SNAP) and design management strategies for the units. Some time prior to this, a national environmental fund had been created (Fondo Nacional para el Medio Ambiente, FONAMA), one of whose first actions had been to draft a proposal for the establishment and funding of the SNAP. This project (Proyecto de Conservación de la Biodiversidad y los Ecosistemas en las Areas Protegidas de Bolivia, PCBB), which involved a group of Bolivian biologists and park specialists from the Institute for Ecology, the NGO Fundación Amigos de la Naturaleza (FAN), and a consultant from TNC, contemplated the following components:
- to establish or strengthen the administration of seven high-priority areas;
- to establish two new protected areas in regions not yet covered by SNAP (Chaco and Madidi);
- to evaluate and, if necessary, modify the areas already created by law;
- to identify potential new sites for protected areas;
- to strengthen the capacity of the DNAPVS to administer SNAP and to fulfill its other functions;
- to establish a long-term funding strategy for SNAP and DNAPVS;
- to train SNAP personnel at all levels;
- to establish environmental education programs for local populations;
- to assess economically important resources in some of the areas of SNAP; and
- to establish an information system to determine the distribution of biodiversity in Bolivia, monitor the administration of protected areas, and evaluate the state of conservation in the areas of SNAP.

One of the most important elements in the design of the PCBB is the commitment of the Bolivian government to seek financing for a Fiduciary Fund for Protected Areas. This would assure at least minimal financial sustainability for the system.
The areas covered by PCBB are: Noel Kempff Mercado National Park, Amboró National Park, Beni Biological Station, Ulla-Ulla Wildlife Reserve, Carrasco National Park, Eduardo Avaroa Andean Wildlife Reserve, Manuripi-Heath Reserve, and the two proposed areas in Madidi and the Chaco. Limitations in funding resulted in only the first four and Madidi receiving full funding from the GEF and the Swiss government. Additional funding is currently being sought.

From other sources, some funding has been obtained for: Sajama National Park, Carrasco National Park, Eduardo Avaroa Andean Wildlife Reserve, Pilón Lajas Biosphere Reserve and Indigenous Territory, Cotapata National Park and Integrated Management Area, Isiboro-Sécure National Park and Indigenous Territory, and Tariquía National Reserve.

Prior to the implementation of this project, the only Bolivian protected area with a management plan was the Beni Biological Station. More recently, one has been produced by the indigenous peoples for the Isiboro-Sécure National Park and Indigenous Territory. The PCBB project will develop management plans for all nine priority areas.

In 1992, the DNAPVS was replaced by the National Administration for the Conservation of Biodiversity (Dirección Nacional de Conservación de la Biodiversidad, DNCB), which has three Divisions: Protected Areas, Wildlife Management, and Germplasm Conservation. After the 1993 general elections, the Ministry for Sustainable Development and Environment (Ministerio de Desarrollo Sostenible y Medio Ambiente) was created to assume the functions of the National Environment Office (SENMA), as well as those related to long-term strategic planning. The new government also created the Ministry for Human Development (Ministerio de Desarrollo Humano), which assumed the functions of the previous Ministries of Health and Welfare and of Education. In this ministry, a new Bureau for Ethnic, Gender, and Generational Issues (Secretaría de Asuntos Étnicos, de Género y Generacionales) was given the same rank as those for health and education.

These restructurings reflected a substantial change in orientation, now permitting the holistic treatment of nature conservation and development, as well as the participation of indigenous peoples in the management of protected areas. Until then, the Under-Secretariate for Ethnic Affairs (Subsecretaría de Asuntos Étnicos) had been an understaffed office within the Ministry of Rural Affairs, which was "plagued" by the problems of land tenure, logging, agriculture, and cattle grazing.

### Participation of local communities and indigenous people

There were at least two problems present in the original design of the PCBB: One was the little attention given to local participation in area management, and the other was that no funding was provided for publications or promotion of the system. Experience since 1992 has shown these to be very important deficiencies, and funding has been sought for both.
Participation of local communities and indigenous peoples in biodiversity conservation and park management is essential, firstly, because participation is the most cost efficient way of managing conservation and perhaps the only truly long-term strategy and, secondly, this is the only ethically justifiable approach.

The relationship between local people and a protected area is substantially different from that of the country’s general population. The traditional environmental education approach, while effective for urban populations, is ill suited to address the “bread and butter” problems of the people living within or around a protected area. Their support is critical for the long-term sustainability of an area and can be rallied only if they feel that the area gives them some benefit and in some manner is theirs. This has obvious implications for profit sharing, park guard selection and training, development programs, tourism, and all aspects of park management.

These considerations have been guiding principles in the drafting of the Bolivian SNAP, its rules and regulations, and the functioning of the National Administration for the Conservation of Biodiversity, DNBC. A new Law of Biodiversity Conservation (Ley de Conservación de la Biodiversidad) has been proposed which would provide for direct participation of local populations and indigenous peoples in a management committee (Comité de Gestión).

**New legal framework**

While the Environment Law of 1992 recognizes the right of NGOs and local populations to participate in conservation, it did not create a clear mandate as to how that should be accomplished.

One problem is that local populations do not generally have individually recognized legal standing (personalidad jurídica). Nevertheless, new rules have been established that greatly facilitate local participation in conservation. In 1994, Article 171 of the Bolivian Constitution was modified recognizing that “the indigenous peoples that inhabit the national territory have the social, economic, and cultural rights, especially on their communal lands of origin, guaranteeing the sustainable use of natural resources, as well as their cultural identity, values, language, and institutions. The State recognizes the legal standing of indigenous and farming communities, and of farmers’ associations and unions”.

The political history of Bolivia will also be greatly affected by the new Law of Popular Participation, which specifies mechanisms for local participation. The new Law of Restructuring of the Executive Branch of the Government empowers the Bureau for Ethnic, Gender, and Generational Issues to orient the environmental and resource management by the indigenous peoples. This will be greatly facilitated by the recently enacted Educational Reform, which calls for bilingual education for the more than 30 indigenous groups in their respective native languages.
The protected areas

In the period since the National Administration for Protected Areas and Wildlife (within DNAPVS, and later DNCB) was created, a number of steps have been taken with regard to the following specific areas:

Noel Kempff Mercado National Park. The management of the Park has been temporarily assumed by the NGO Fundación Amigos de la Naturaleza (FAN), until a long-term agreement is reached. This area obtains the highest financial support of all Bolivian protected areas, including funding from FAN, PCBB, and the Natural Resources Project of the German Bank for Reconstruction (KFW).

Isiboro Secure National Park and Indigenous Territory. The indigenous Yuracare, Trinitario, and Mojeño communities of this protected area have drafted their own management plan for the area. They have obtained financial and technical assistance from the Institute for Ecology and the German Agency for Technical Cooperation (GTZ). Coordination under SNAP has advanced and projects financed by the European Economic Community (EEC), through the Amazon Cooperation Treaty (Tratado de Cooperación Amazónica), are under way. Future management of wildlife will have the guidance of experts from the University of Florida. A local NGO, the Centro de Investigación y Documentación para el Desarrollo del Beni (CIDDEBENI), has played a very important role in this process.

Pilón Lajas Biosphere Reserve and Indigenous Territory. An initial phase of discussions with the local farmer and indigenous communities, led by the DNCB, has overcome the strong opposition that existed to the creation of this reserve. At present, a first proposal for a management plan has been presented by the NGO Veterinarios sin Fronteras. Its implementation has received the support of the EEC. Sustainable management of natural resources is being developed through the Tropical Forestry Action Plan and the British Mission in Bolivia.

Eduardo Avaroa Andean Wildlife Reserve. For the first time since it was created, this area, that receives the highest numbers of tourists of all protected areas in Bolivia, has been managed, and agreements have been reached with local tour operators. The Reserve has been included in the Montreux Register of the Ramsar Convention and a monitoring program has been designed. Financing for this area will be included in a second stage of the PCBB. For the time being, some local financing will provide for minimal control.

Ulla Ulla Wildlife Reserve. This important reserve had stopped being managed as a vicuña reserve, even before the National Institute for Wool Production (Instituto Nacional de Fomento Lanero) that managed it was dissolved in 1989. New agreements have been reached with the local communities and CESI, a local rural development NGO, including a training process by which management would eventually be handed over to the local community. Financing was obtained through the PCBB.
Sajama National Park. Although this national park was the first protected area created in Bolivia (in 1939), its limits have not yet been defined, nor has any management taken place. A number of workshops have been carried out in the area with the indigenous communities, the basis for participatory management has been set, and a proposal for the limits was presented to the government. Some financing through the Inter-American Development Bank will facilitate the initial management steps.

Amboró National Park. The northern and southern sectors of this park had been managed almost independently and there were serious problems in coordinating actions. Since 1992, management has been unified under one authority, training has been given to park wardens, and financing for the management has been obtained through the PCBB. The administration of the Park will be given to an NGO after an open evaluation. The process of drafting the new limits of the Park with the agreement of local communities has almost been concluded, but new opposition to this process arose from some conservation groups.

Cota Pata National Park and Integrated Management Area. This area has been recently created in an archaeologically important area, covered with cloud forest. One of the problems that conservation in Bolivia has had to face is the difficulty in making protected areas accessible to the general public. Most Bolivians have never experienced being in a protected area, due to the large distances and poor road conditions in the country. Since Cota Pata can be reached within one hour’s drive from La Paz, the most populated city in Bolivia, and where most policy makers live, the educational value of this area is of the greatest importance.

Beni Biological Station and Biosphere Reserve. (cf. editorial update article E. Salinas).

Tariquia Reserve: This area has received support from the “Parks in Peril” Program of the Nature Conservancy. PROMETA, a local NGO has developed a strong participatory relationship with the local population.

Carrasco National Park. The Park has been incorporated to SNAP, and some financing has been provided by PCBB. This area had received little attention until 1992. Although park guards have been present in the Park, they have acted without much guidance. There are still some very difficult problems to be solved with the local populations.

Torotoro National Park. The effective management of this area has been hindered by the lack of adequate incorporation of the local communities. Nevertheless, some financing has been obtained by the Asociación Conservacionista de Torotoro, an NGO that was instrumental in the creation of this Park. A modification of their approach to local participation could resolve some of the present management problems.
Madidi National Park (proposed). This area includes the highest rates of biodiversi-
ty in Bolivia. It shares a border with the Tambopata-Candamo and Pampas del
Heath Reserve in Peru. Taken together, they form one of the most important areas
for biodiversity in the world, ECOBOLIVIA, a local NGO has been working with
the indigenous communities, who now support the creation of a national park. This
proposal is currently being considered by the Bolivian Government.

Gran Chaco National Park and Integrated Management Area (proposed). Since
1993, the governments of Bolivia and Paraguay have expressed their interest in
coordinating the creation and management of protected areas along their common
border. Bolivia proposed an area, which coincides with the proposals developed by
the Guaraní people from the area of Izozog. This would be the most important
protected area for dry (xeric) environments in the Tropics. The fact that from its
very outset this area has received the active support from the local indigenous
communities gives it a great importance in the future of protected area management
for Bolivia. The proposed area would cover over 2,000,000 hectares, and would also
include important wetlands.

The future

Even though there has been great progress in park management in Bolivia in the
past three years, many difficult problems remain to be solved in the near future. The
legal framework must still be considered inadequate until the Law of Biodiversity
Conservation has been passed. Human resources are still not sufficient. The general
public is very poorly informed of the advances in this field and many misconcep-
tions still prevail. There are still conservationists that retain the “parks-without-
people-view” of conservation. The management of parks by the people through
their community organizations, or with the assistance of NGOs, will pose a number
of unknown problems. So far, “paper parks” have caused little costs, and hardly
created any resistance. Fortunately, however, things have started to change in
Bolivia.

Editors’ note: Since fundamental changes have taken place in the policies of nature conser-
vation and the management of protected areas in Bolivia, the editors chose to include this
extensive update to the article of Maria de Marconi and Susana Donoso in form of an
additional article, submitted in February 1995.
Abstract: The Beni Biosphere Reserve and Biological Station (EBB) is situated in Beni Province, in the north-eastern plains of Bolivia. The most representative human groups in the EBB area are the Chimane ethnic group, several farmer communities and a few cattle ranches, with an approximate population of 1200 persons. The main socio-economic features are the high incidence of diseases prevalent among the child population, the low educational level, and the economic structure of subsistence farming and commercialization of surpluses. An integral program of environmental education and support for the sustainable development of the EBB rural population was started in 1987 under the direction of the Interdisciplinary Community Studies Center. Work was done with five communities in the Reserve’s area of influence with a population of 897 persons. The program was oriented towards integrating the population’s general requirements (education, health, production and use of resources) in the construction of a viable sustainable development option for the region.
Administration and management

The establishment and development of the Beni Biosphere Reserve, that includes the Biological Station, is one of the most significant wildlife conservation and management projects presently being carried out in Bolivia. The greatest challenge faced in the creation of EBB was that of proceeding from a decision on paper and a territory on the map to the construction of an entity capable of achieving the basic objectives for which it was created.

The EBB has been recognized by The World Conservation Union (IUCN) as Category I: Scientific Reserve. The presence of a large population of the Chimane indigenous group and other rural communities within the EBB area led to its designation as a Biosphere Reserve in October 1986 by the MAB-UNESCO International Council. Since then, its development has centered on promoting conservation of the area’s biological diversity, in the context of a balanced relationship between Man and Nature. As a Biosphere Reserve, its function is to protect the area, perform basic and applied research, promote environmental education and participate in regional development.

The administration of the Beni Biological Station is under the care of the Bolivian National Academy of Science (Academia Nacional de Ciencias de Bolivia, ANCB). It has a central office in La Paz and an operational center at a ranch called El Porvenir (3,000 ha) situated in the savanna area 50 km from San Borja. At present, 15 officials work at El Porvenir, but there is infrastructure for 30 persons.

A zoning scheme for the Beni Biological Station has been defined based on the preparation of different thematic maps reflecting its ecological, socio-economic, and cultural features, as well as the use of its natural resources. It divides the EBB into six zones:

- **Core Zone (zona núcleo):** set aside for the strict protection of ecosystems, flora, fauna, and landscape.
- **Buffer Zone (zona de amortiguación):** established within the EBB to ensure maximum protection for the core zone. Research, intensive monitoring, and scientific tourism activities are to be concentrated here.
- **Sustained Multiple Use Zone (zona de uso múltiple sostenido):** for applied research, recreation in natural surroundings, and sustainable use of natural resources by the inhabitants.
- **Recovery Zone (zona de recuperación):** consists of ecologically important areas that have been altered by human activities and require special management activities to restore their natural conditions.
- **Special Use Zone (zona de uso especial):** reserved for the establishment of infrastructure like control posts, research refuges, etc.
- **Proposed extension of buffer zone (zona de reclamo para fines de amortiguación):** although this zone is outside EBB’s limits it has been included as a reclamation zone due to its great fauna wealth.
Map 1

Bolivia: zoning and human settlements in Beni Biological Station

Settlements:
1. San Borja
2. El Porvenir
3. Galilea
4. Villa González
5. Puerto Méndez
6. Tierra Santa
7. Santa Elena
8. El Remanso
9. El Totazal
10. Los Tajibos
11. Muniquicito
12. Isla de Creta
13. Chirigüa
14. Alianza
15. Carmen del Mato
16. Venecia

Legend:
- Core zone
- Buffer zone
- Proposed extension for buffer zone
- Sustainable multiple use zone
- Restoration zone
One of EBB’s most significant contributions to the development of Bolivia’s protected areas has been the planning of the activities carried out since its inception, leading to the preparation and completion of the first management plan ever made for a protected area in Bolivia. Its components are: 1) environmental management; 2) cooperation; 3) scientific research; 4) environmental education; 5) anthropological program; 6) operations, and 7) planning. The work of national and foreign researchers and the systemization of their contributions through the management plan have provided EBB with the most important data base available in Bolivia on a specific area of ecological significance.

The agreement signed in 1987 between the Bolivian Government and the North American NGO “Conservation International” has made available to EBB, through a debt-for-nature swap, an operating fund of US$ 250,000 on an initial basis to guarantee long-term financial support for the station.

Environmental impacts in the Reserve

The Beni Department is the second largest in Bolivia. It has an estimated area of 213,564 km² and 282,631 inhabitants (1.32 inhabitants per km²). The departmental capital, Trinidad (pop. 50,203), falls within the sphere of influence of the Beni Biological Station. San Borja, with a population of 12,000, is the urban center nearest to the Reserve. Many of its inhabitants are people of Aymara and Quechua origin who have migrated from the highland regions. It is traditionally a cattle-raising region, although agriculture and forestry have increased in recent years due to the improved road network between La Paz and Trinidad. This has given rise to a spontaneous agricultural settlement process which affects EBB, mainly along the Maniqui River and in the southern region.

Some sectors inside the Reserve have suffered strong environmental impacts due to the activities of the inhabitants and the presence of hunters and fine wood loggers who work with chain-saws. The southern and south-western zones of the Reserve, consisting chiefly of the fertile terraces of the Maniqui River with dense, high forests, are under strong pressures from agriculture, logging, and hunting. In the southern zone of the Reserve there are patches of “mara” (Swietenia macrophylla), a timber species with high market value, and this has resulted in the zone being invaded illegally by neighboring landowners and small-scale loggers to extract mara-wood. At the same time, this is a priority zone for conservation of EBB because it forms part of the vegetation belt that maintains the Reserve’s forest in contact with the sub-montane forest. Further damage to the area through uncontrolled use of resources could lead to its physical isolation, with the resulting loss of biodiversity.

Savanna areas in the Reserve are used for extensive small-scale cattle-breeding and the meadows are burned at the end of the dry season to obtain suitable cattle
forage. This results in loss of the savanna's forage-bearing capacity, as well as causing fires in the surrounding woodlands.

Notwithstanding numerous efforts to involve the inhabitants who live in the vicinity of the Reserve, EBB's field experience has shown that the Beni community still looks on the Reserve as an abstraction. For its presence to have significance and for its work to become an organic part of the regional development process, closer and more efficient coordination with the different population sectors is required to integrate them gradually into the planning and management of the Reserve.

**EBB's double status: protection area and indigenous territory**

Bolivia is rich in cultural diversity. There are 36 ethnic groups settled in the different regions of the country, each with its own language, culture and history. Although they represent a significant part of the population (almost 50% of the country's 7 million inhabitants are indigenous peoples, of whom 95% are Quechuas or Aymaras), the participation of the indigenous groups has not been as significant as their demographical weight and their contribution to cultural and economic activities would justify. The indigenous peoples of the eastern region, for example, have been almost completely excluded from national development.

From pre-colonial times to the present the area has formed part of the traditional territories of various indigenous peoples. Within EBB's territory and its immediate area of influence, there are some 21 Chimane settlements, totaling 800 persons. The settlements are organized around core families or widely interrelated family groups. The core family operates as an independent social, political and economic unit. The Chimanes have a subsistence economic system but are also integrated with the regional market through surplus agricultural produce (rice, plantain) and through the production of the "jatata" or royal palm (*Geonoma deversa*), which is used to thatch roofs, in the Alto Maniqui region (outside the EBB). They also practice hunting, fishing, gathering, and handicraft-making. They have wide knowledge of traditional medicine, but there are no health or educational establishments to attend to the needs of the Chimane people within the EBB area. The Chimanes don't have any central political organization, although the High Chimane Council (*Gran Consejo Chimane*) was created in 1989 under the sponsorship of the New Tribes Mission (*Misión Nuevas Tribus*), which has been operating in the region for around 30 years. This organization represents a significant sector of the Chimane population. It is at present engaged in furthering its development and finding solutions to problems with the settlers and traders of the area.

An event that stirred all Bolivia in September 1990 was the “Territory and Dignity” March of the indigenous peoples. After a 32-day trek, 750 indigenous people reached La Paz on September 17. For the first time, the whole country became aware of a hitherto unrecognized reality: a large part of Bolivian territory...
was inhabited by indigenous peoples unknown to the great majority. The issue in
debate was that of territory, complemented by the question of the development and
conservation of the region’s natural resources, mainly because part of the territories
claimed affected the Chimanes Program and the timber extractions being carried out
there. After long and difficult negotiations, the indigenous group finally obtained
the enactment of three governmental decrees that made them the legitimate owners
of the territories claimed in the Chimanes Forest, Isiboro-Séecure National Park, and
Ibiato.

Of the EBB area alone, 30,000 ha have been designated indigenous territory in
1990. As far as the station is concerned, this means a substantial change in the way
its relationship with the Chimanes people is conceived. Although the management
plan policies establish the need to support the social, economic, and organizational
development of the Chimanes, in the planning process for the EBB’s activities no
mechanisms were found for the Chimanes’ participation in the anthropological
program. One of the most important reasons was that this group did not have a
central organization that could coordinate with EBB. The EBB now faces the
challenge of making its conservation role as a Biosphere Reserve compatible with
the presence of the Chimane people with a consolidated territory and their resulting
subsistence and development requirements, so that both tasks may be possible
without the one impinging on the other.

The first steps have already been taken. A profile of the demographic, socio-
economic, and cultural reality of the Chimane people have made it possible to
design a participative development project for the Chimanes in the EBB. This
proposes the formation and development of a Chimane organization in the area of
the Reserve to further their social development and coordination with the EBB
administration. An efficient marketing system will also be developed for Chimane
products, so as to prevent possible ecological impacts in the area due to unplanned
production and demand. Health and bilingual education will be dealt with in the
planning process together with the Chimanes.

At the present time, EBB is carrying out a training and production experiment in
ten radio programs with the High Chimane Council and the Indigenous Peoples’
Center (Central de Pueblos Indígenas). The project aims at developing the
indigenous peoples’ capabilities in the management of radio program techniques so
that they may have their own inter-cultural broadcasting opportunities and thus
obtain better knowledge of their problems.

Farmer communities in the Reserve’s area of influence

The farmer communities located within the Reserve are Tierra Santa, Santa
Elena del Maniquí, and El Remanso, with a population totalling 309 persons.
Within EBB’s area of immediate influence are the communities of Galilea, Villa
Beni Biosphere Reserve and Biological Station: education and development

These population groups consist of regional immigrants who have settled in the zone since the sixties and seventies to have their own land for agriculture and also to be near the highway. They do not have a title to their land. The cultural origins of these mestizo communities are European and indigenous. Many heads of families said that their parents used to speak an indigenous language (reyesano, ignaciano, and movima), although they themselves no longer do. The authorities (corregidor, field magistrate, and school magistrate) are elected by the community itself at a general assembly. There are also a few cooperatives (of a rather nominal nature) and mothers’ clubs which undertake the distribution to their members, at low prices, of the donations of foodstuffs they receive (milk, flour, and butter).

The main economic activity of these communities is subsistence agriculture with the marketing of their surpluses. The family economy includes the use of forest resources through hunting, fishing, and gathering. Other activities include handicrafts, internal trade, carpentry, and working on other farms in the vicinity. Problems that affect these communities are their low income levels and the absence of alternatives for economic improvement, as evidenced by their unsatisfactory food, health, and housing conditions.

Program for integral environmental education and sustainable development

In 1987, the environmental education program arose on the initiative of the Beni Biological Station, which entrusted its design and execution to the Interdisciplinary Center for Community Studies (Centro Interdisciplinario de Estudios Comunitarios, CIEC) with financial backing from Conservation International and the Worldwide Fund for Nature (WWF). Its main objective was to achieve an adequate level of awareness with respect to ecological surroundings and the need for their conservation. It also sought to contribute to community development. One of the program’s basic proposals was to develop a project that would integrate the inhabitants’ overall needs with their active participation in the process of constructing a viable alternative for sustainable development, so as to maintain the production potential of the ecosystems. This implied considering conservation problems from different angles, such as community health and education, environmental improvement, production, and adequate use of natural resources. The program therefore had the following features:

- it was community-based;
- it was oriented towards coordinated action;
- it sought to integrate the community’s basic needs with the Reserve’s conservation requirements;
- it was directed towards training people;
- it aimed at achieving permanent action beyond the termination of financed activities.
With a view toward planning the activities, a socio-educational diagnosis was performed (1987) in the main towns within the EBB’s sphere of influence: Trinidad, San Borja, San Ignacio de Moxos, and Santa Ana de Yacuma, and in the rural community of El Totaizal. The final results of this process provided the EBB with information on the educational, organizational, and socio-economic features of the population and their views on the region’s environmental problems. The development of the program also included demographic studies and diagnoses of the standard of living in each community, as a basic tool for planning and information on the realities and necessities of the inhabitants. The population took part in gathering this information and some of the results were later sent back to the communities.

The first field experiment was the execution of two pilot projects which addressed formal environmental education at San Borja and El Totaizal (1988). It was important to perform a first evaluation of the achievements and difficulties encountered at community participation level and their satisfaction with the activities developed, so as to adapt the action proposals to the population’s own particular characteristics, requirements, and interests. The second stage involved four other communities located in the Reserve’s immediate sphere of influence: Santa Elena del Maniquí, Tierra Santa, Galilea and Villa González, while the work at El Totaizal was continued. The program was planned in four areas:
- strengthening of community organization,
- improvement of health conditions,
- support for agricultural production,
- inclusion of environmental education in school programs.

**Strengthening of community organization**

The foundation of any development program is the community’s organization and management capacity. At the start of the program at El Totaizal, EBB was faced with a population that acted on an individual basis and whose experience in the performance of group tasks by the community had generated conflicts and mistrust. The organizational problems and the absence of a feeling of solidarity among the people were evidenced by the bureaucratic nature of the community authorities, who made no effort to stimulate tasks for the community’s benefit. Strengthening their organization and participation in decision-making therefore became one of the program’s basic objectives.

One important step was to involve the communities in planning activities and diagnosing their basic needs, thus motivating their participation and the adaptation of the project to community needs. A reconstruction of the history of El Totaizal helped to reinforce their sense of community continuity. In the organizational aspect, however, the program was unable to achieve a real transformation. Among the errors made in approaching the community was that of not having seen clearly
the internal conflicts between two of the most influential families, and not having made the necessary efforts to enter into formal agreements with the authorities, a fact that was reflected in their minimal participation in the program. The way of carrying out the work was therefore changed: the method of discussing the problems at meetings was replaced by the more personal method of individual interviews with each family.

The organizational features of the other four communities involved in the second stage of the program were not only different from those of El Totaizal but also from each other. For example, in Galilea we found a community with harmonic relations and mutual collaboration, while at Villa González the main problem stemmed from the fact that the population was scattered over a very wide area, which made it difficult to solve community problems. The experience acquired at El Totaizal led us to recognize the strategic importance of developing the organizational possibilities within each community by training community promoters. An important achievement was that the activities of these promoters involved recognition of the community’s capabilities and potential. The communal authorities took a much more active part than at El Totaizal, but in this case also no formal agreements were made or responsibilities assumed for program execution and follow-up.

The first stage of the work was conceived on the basis of non-permanent presence in the area. A solution was sought based on workshops to train community members to execute the health and agricultural projects. Although results have been developed in this work, the need for permanent support led to the inclusion of a resident agronomist in the project team to coordinate activities in the second stage.

**Improvement of health conditions**

The program’s strongest emphasis from its very beginning was on health, in response to the demands and interests of the population. The high incidence of diseases in the infant population (diarrhea, respiratory problems), as well as lack of attention on the part of the organizations in charge, which have insufficient capacity to cover these health needs, led to the development of a training program for community promoters in accordance with the government policy of attention to mothers and children.

The health work was based on the formation of a team of Peoples’ Health Officers (Responsables Populares de Salud, RPS) in each community. These RPS were elected by their communities and were given training that would enable them to provide primary health care and first-aid, as well as to pass on their knowledge to mothers and to the population in general. There are currently 16 RPS in the communities. The RPS also took over the registration and updating of the census data of their communities and the health registry of expectant mothers and children under five. This is a very important task since it provides the communities themselves with accurate information on their population dynamics and state of health.
Vaccination campaigns were carried out with the collaboration of the San Borja Hospital, whose personnel also provided important support in training the promoters and distributing medicines to the RPS. With a view to improving environmental sanitation, wells were built at Tierra Santa and El Totaizal and a model latrine was installed at El Totaizal. All work was done by the local inhabitants.

The designation of the Peoples’ Health Officers and the degree of community acceptance is not yet entirely satisfactory, particularly in the case of the younger RPS. Nevertheless, it is evident that the community members are becoming aware of the importance of preventing disease through vaccination, clean water consumption, food, and housing.

It is foreseeable that the number of RPS in each community will have to be increased in future so as to ensure permanent service and reinforce the training received. Lastly, a “Manual on health in the tropics” (Manual sobre temas de salud en el trópico) was prepared and an educational health video made with the participation of the members of the communities. The manual has been issued to the RPS to be used as support in their task of promoting community health.

Support for agricultural production

When the program commenced at El Totaizal, the idea was to implement a model school vegetable garden, which would provide an opportunity not only for improving the people’s diet but also for introducing better techniques for vegetable growing and sustained soil management. This experiment led to the publication of the “Manual for vegetable gardens in the tropics” (Manual de huertos en el trópico), which has had great success, especially among agricultural educators.

The interest shown by some people of El Totaizal during the work process led to additional training courses on traditional crops, soil fertility maintenance, pest control, and basic agricultural economics. While there was a significant improvement in the organization and care of the school vegetable garden, the majority of the inhabitants of El Totaizal didn’t show major interest in the activity, since they were not accustomed to consuming vegetables. Other negative factors that influenced the acceptance of the project were the attacks of sepe-ants and the fact that vegetables generate no financial income because of transport and storage difficulties.

Low income levels, the lack of economic alternatives, and poverty in general, are all important obstacles to the successful development of a program whose objective is the overall improvement of a community’s living standard. Forced to struggle for their survival, the people consider additional activities as being of only secondary importance.

This reality led to the design of a second stage based on the experience acquired. The idea was to make a joint effort (rural communities project) to find economic alternatives in order to raise their income level and living standards. To commence,
it was necessary to carry out participative agricultural research work to learn more about current production systems and establish technical bases for the improvement of production and the development of agricultural techniques adapted to local ecological features and the inhabitants’ cultural conditions.

Workshops were also organized about traditional crops (rice, cassava, corn, etc.), citrus fruits and the proper use of agricultural chemicals. These workshops, which were organized by the Beni Technical University (Universidad Técnica del Beni) as part of its cooperation agreement with the EBB, also addressed issues relating to agricultural economy and livestock management (hogs and poultry). Great emphasis was laid on the cultivation of legumes, particularly haricot and soya beans, due to their high protein food value and as a soil regeneration method. Community seedbeds were also set up to diversify production.

Although this training has enabled the farmers to have access to new agricultural techniques and obtain significant results in improving production of some crops (corn, green vegetables), it has not been possible to find alternatives that would enhance the community’s production capacity and income level. It is necessary to develop a production strategy that includes traditional crops but also analyzes the possibility of marketing products that would be competitive on a regional and national basis. This would also help to reduce the pressure on the Reserve’s natural resources.

Training of agricultural and livestock promoters was not as effective as it was in the area of health, probably because attendance at the workshops involves some sacrifice for the members of the community, since they have to leave their daily tasks and also do not obtain immediate results. It will be necessary to strengthen the agricultural promoters, evaluate their degree of representativity and their willingness to apply the training received in their communities.

Inclusion of environmental education in school programs

The pilot project on formal environmental education was initiated in 1988. It focused on teacher training in the basic concepts of ecology and environmental conservation, and on teaching techniques. An “Environmental Education Manual” (Manual de educación ambiental) was prepared to support this training and enable teachers to plan their classroom activities. The teachers of the San Borja and El Totaizal schools took part in the workshops. Learning modules were prepared for this purpose, including information on the subject, practical work, and evaluations.

The results of this first experiment were satisfactory. In the first place, it aroused the teachers’ interest in environmental education. The complete novelty of the subjects being dealt with and their connection with their surroundings was a significant discovery for the teachers. Moreover, this workshop enabled them to take an interest in finding different ways to work in the classroom and train themselves to manage a wider variety of educational resources.
Follow-up of this program in a second stage could not be carried out as planned due to lack of financial resources. Steps are now being taken to continue with the experiment. During the development of the program with the communities and schools, attention was drawn to the functions and activities of the Beni Biological Station, with emphasis on relationships and mutual benefits. This task was made possible by the free distribution of the Manual on Beni Biological Station and its Community (Manual de la Estación Biológica Beni y su comunidad) to both the population and teachers.

Conclusions

In general, the program has been of great assistance to the communities in helping them to identify their problems and basic needs and their responsibility in finding solutions. Notwithstanding some methodological errors, this first direct experiment in the field has taught us some important lessons in dealing with the relations between EBB and the surrounding communities.

The participation process is often very slow in the beginning, due to the communities’ lack of experience in working with this type of program and their difficulty in understanding its objectives and benefits. Thus it is necessary to support the community’s existing organizational and hierarchical structure.

In addition, there must be sufficient time for reliable results to be produced and for the projects to leave a foundation for independent work in the future. One basic requirement is to act through the community’s own organizational mechanisms (traditional and political authorities) and make formal agreements to ensure fulfillment of the commitments. By identifying and supporting the initiatives and efforts of those who wish to become actively involved in community work, it will also be possible to train leaders.

The success of the project in the long run will depend on the permanent presence of a multi-disciplinary working team that lives within the EBB, consisting preferably of professionals born in the region or who at least have lived there for a long time. This will help to form a group of people who progressively can be integrated in EBB’s activities.

The internal structure of EBB made it necessary that research work and development and education projects were performed by institutions through cooperation agreements. This work system is both interesting and economically positive since it involves concrete financing for each project and does not put responsibilities on a very small EBB team. Undoubtedly, however, this method may generate coordination problems which, while not unsolvable, can cause difficulties when it is sought to make the results more efficient. An effort should therefore be made in future projects to mutually provide for greater interaction and sustained information flow regarding achievements, progress, and difficulties.
Questions posed during this work:

1. Have we been able to go beyond the strictly scientific work of the EBB?
   The scientific work carried out by the EBB has undoubtedly been one of its
greatest contributions to natural science knowledge in Bolivia and one of the
activities that have required major institutional support, particularly in its early
years of operation. The problem arises when its work as a Biological Station has to
be harmonized with that of a Biosphere Reserve. On linking its responsibilities with
the task of making conservation compatible with sustainable development, in the
context of a living area where various communities and ethnic groups are
established, the need to expand the research area becomes more and more evident.
On the one hand, pure research, which is essential not only for its area of influence
but also for the whole country, and on the other hand, applied research, which is of
immediate interest to the members of the region’s many communities.

2. Do we fully understand the relationship between conservation and people?
   Our field work experience taught us several things. The first was that some of
the ideas that seemed important and determinant in the initial design had to be
transformed by experience in the field, and above all by the contribution of the
inhabitants, who steered us towards the community’s real needs and requirements.
The second was that the success of the program depends on the level of community
participation and involvement in the process of finding a sustainable development
alternative, based on their own culture. All this work would be in vain if we did not
take into account the fact that the experience, tradition and cultural equipment of the
community form the axis around which any development project should be built.
This demands greater creativity and commitment to the community in seeking
solutions to their problems by identifying and supporting initiatives that arise from
among the people themselves and thus achieve positive results. If it is true that one
of the central objectives of any program or project (including the management plan
itself) is the participation of the inhabitants of the region involved, it would seem
essential not only that this should occur at executional level but also that its
contribution should commence from the preceding stages of program planning and
design. This process will obviously be slow and laborious and will depend on pilot
experiments to learn methodologies and practical forms of application.

3. Have we proposed viable alternatives to make development compatible with
   conservation?
   We believe that one of the program’s most successful aspects was that it was con-
ceived as a whole. Previous experience has shown that isolated treatment of the
factors that affect the quality of life of the population does not always produce the
expected results. Action plan proposals must be combined with community require-
ments by applying programs that take into account their participative organization,
health, production, education, and conservation. The management planning basis for
the Beni Biosphere Reserve and Biological Station rests on the need to make both concepts compatible (conservation and the need for development) so as to transform the criterion of preservation into that of sustainable use, involving a more dynamic participation by the community in the management and conservation of the area and a joint effort to find means and options for development.

These ideas are a point of departure, and some of them are already in progress. Many issues, however, have not yet been developed due to the magnitude of the work they involve: for example, the active participation of the Chimane ethnic group, the question of the indigenous territories recently established by the government as a result of the indigenous peoples' march in September 1990, and the specific need for socio-economic development of the area that should be included in the whole EBB work process.

**Editorial update:** The EBB community participation programs have continued and an agreement has been drafted between the National Administration for the Conservation of Biodiversity (Dirección Nacional de Conservación de la Biodiversidad, DNCP) and the National Academy of Sciences (Academia Nacional de Ciencias de Bolivia, ANCB) for the future management of the area within the national system of protected areas (Sistema Nacional de Áreas Protegidas, SNAP; pers. com. M. Baudoin, February 1995).
Amboró National Park and settlement pressures

Arturo Moscoso V.

Abstract: Amboró National Park is located in the submontane belt of the Bolivian Yungas, in the Province of Santa Cruz. It was declared a priority as a "Park in Peril" in Bolivia, mainly because of the great number of settlers within its boundaries. Various ideas were considered to provide solutions to this conflictive situation and to reconcile the opposing aspirations of the park administration and the inhabitants. This chapter includes a description of the functioning of the team of settlers-turned-park-rangers, the idea of a "red line" to separate the core area from the settlement area of the Park, and the farmer delegation's proposal that served as the basis for an agreement between the inhabitants and the park administration. In this agreement, the settlers vow to assist in protecting the Park from new settlements and other activities that could undermine its ecological integrity.

Amboró National Park, which has an area of 180,000 ha, is located in the sub-Andean belt of Santa Cruz Department and belongs to the biogeographical province of the Yungas. The Park has a unique geographical situation, right at the so-called "Elbow of the Andes", the point where the Chilean Andes deviate from their north-south axis and swing to the west into Peru. Located in a transition zone between temperate and tropical zones, the Park has great biological diversity and provides material for interesting studies on the evolution, distribution, and ecology of flora and fauna. There is a variety of feline species, at least eight species of monkeys, and more than 600 bird species (Clarke, 1987).

The Park possesses extensive impenetrable areas containing habitats that still guarantee the survival of some of the endangered species referred to in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). These include the spectacled bear (*Tremarctos ornatus*), the bush dog (*Speothos venaticus*), the curassow matán azul (*Pauxi unicornis*), the hoatzin (*Opisthocomus hoazin*), the red macaw (*Ara rubrogenys*), the Andean condor (*Vultur gryphus*), and the black-and-white hawk-eagle (*Spizastur melanoleucus*).

A document prepared in 1984 by Noel Kempff Mercado and the English biologist Robin Clarke laid the foundations for the creation of the Park, outlining the area's characteristics and emphasizing, above all, its wide diversity of ecosystems. Protection of the area was recommended because:
- it has great biological diversity, in both flora and fauna;
- it is the home of many endangered animal species;
- its topography makes it unsuitable for settlement;
- it is the site of the headwaters of several rivers that feed the Surutú and the Yapacani streams;
- it is a region of great scenic beauty, with many recreational and educational possibilities;
- its location enables easy access to the inhabitants of the nearby city of Santa Cruz.

Amboró National Park was created in 1984 (the same year the document was prepared) by Supreme Decree No. 20,423, and included the Germán Busch Nature Reserve, which had been designated in 1973. The Decree specifies that the Forestry Development Center (Centro de Desarrollo Forestal, CDF) in Santa Cruz will be in charge of the park administration.

The distance from the southern sector of the park to Santa Cruz de la Sierra is only 20 km, whereas to the northern sector 120 km have to be travelled. Access to the area is by the new Santa Cruz-Cochabamba highway, turning off at Buena Vista. From Buena Vista to Espejillos there is a road running parallel to the Surutí river (the Park’s natural boundary on the east), from which paths branch off to several villages.

At the present time, Amboró National Park is administered by a director, with the support of a consulting scientist, an assistant scientist (internationally supported) and 21 park guards. The Forestry Development Center budgeted some 33,000 dollars for the Park in 1990, and in addition the environmental impact study of the Chimoré-Yacapaní project included a 45,000-dollar component for Amboró Park for four years. The budget is above all to guarantee protection of the park, produce a management plan and prepare a tourism project. Through the “Parks in Peril” Program of the North American NGO The Nature Conservancy, the Amigos de la Naturaleza foundation obtained funding amounting to 450,000 dollars over three years to support management of Amboró National Park.

The current park administration is engaged in the demarcation of the Park’s boundary, the production of signs, a census of the local population, the construction of control and observation posts, the preparation of radio programs in the region, the employment of park guards, and the preparation of park regulations.

The park inhabitants

30% of Amboró National Park consists of lowlands where humid tropical forests predominate. This area has undergone great alteration, mainly because of the presence of farmer families who live there on either a temporary or permanent basis. Occupancy of the Park covers 42,447 ha or 22% of the total park area and over 80% of the lowlands, which are of great ecological importance. The settler families have a subsistence economy, their main crop being rice. 25% of them possess a few heads of cattle and many have horses. Only 9% of the settled area is under cultivation and 11% are pastures for horse-, cattle- and sheep-grazing. (Cox / Cabrujas, 1989). The fact that there are 13,913 ha of fallow land shows that the
majority of the farmers cultivate crops in unsuitable areas. In only a few years the Park's extensive low forest has become vegetation of no ecological or economic value. The existence of high brush in some areas is due to recent settlement; primary forests still exist near the rivers, but a great part of the low area is being affected by clearing, which destroys the river banks. The park administration has begun to take steps for the protection of these.

The inhabitants of the area are located at different sites near the rivers, such as: El Carmen on the Saguayo River (50 families); Aguas Blancas, Carbones and Recompensa on the Cheyo River (100 families); Villa Amboró on the Macuacu River (42 families); and Nueva Palestina on the Semayo River (89 families). In the southeast of the Park are Sindicato 25 de Septiembre (115 members), Ex-Combatientes (71 members), and others. The Park has a total population of 4,320 persons.

The 1989 census recorded that 23 families had migrated from the Potosí altiplano, 369 from the valleys of Chuquisaca and Cochabamba, 240 originated from the subtropical region of Santa Cruz, and the rest from other regions. 66% of the settlers have some basic education and 25% are illiterate. The Quechua language predominates (69%) over Spanish (23%) (Cox / Cabruja, 1989). Some of the farmers were already settled in the area prior to the creation of the Germán
Busch Reserve in 1973 and hold title deeds to their land. Another group arrived between 1973 and 1984, the year in which Amboró National Park was created. A third group settled after 1984 and have no documents or land titles. The flow of settlers still continues and there are already a fair number of settlers who are descendants of the pioneers.

“No” to resettlement

The census referred to above was not an easy matter, because the farmers were reluctant to cooperate with the interviewers. Therefore, the census was finally carried out by a commission representing the Agrarian Reform and Settlement Institutions, the Forestry Development Center, Amboró Park officials, and farmer representatives. The census specified data on the socio-economic situation, land use, construction and wire fencing, type of crops, land tenure, and resettlement possibilities. The question regarding resettlement was as follows:

“If it is possible to obtain support to move you out of the Park, this support should be which of the following:

Option 0 - pay compensation,
Option 1 - move you out of the Park with financial compensation,
Option 2 - move you to lands you already have outside the Park,
Option 3 - provide technical assistance,
Option 4 - ‘no’ to resettlement.”

The results shown in Table 1 can be differentiated as follows: in the first month (May 23 to June 25, 1989) 48.7% of the inhabitants expressed their interest in leaving the Park with financial compensation or assistance (the average amount of compensation asked for each family’s 50 ha lot being 5,000 dollars), while in the second month only 13% said they were interested in leaving the area. The reason for this is that by the second month the farmer unions and organizations had advised their members to mark option 4 in the survey: “no” to resettlement.

The farmer delegation’s basic proposal

After many months of aggressiveness, imprudence and lack of understanding on both sides, the farmer organizations called an extended meeting in which the following points were approved as the basic proposal for negotiating the signature of a “park-settlement-agreement” with the park administration and government officials:

Point A: The farmers will not discuss land ownership with the Forestry Development Center. This problem must be discussed with Agrarian Reform Institutions, the National Settlement Institute and the National Government.
Bolivia. Photo 10/11: The Chimane Indians form an integral part of the Beni Biological Station and Biosphere Reserve. The toasting of grated manioc is one step in a traditional way of preparing this tuber for human consumption.
Bolivia. Photo 12/13: Amboró National Park. Especially in the northern part of this important protected area in the southern Yungas, the felling and burning of trees causes great management problems. Uncontrolled extraction of forest products (here: stems of tree-ferns) often leads to destruction of valuable resources.
Table 1

Bolivia: responses of farmers living in Amboró National Park with respect to options for resettlement

<table>
<thead>
<tr>
<th>Management options</th>
<th>Replies first month</th>
<th>Replies second month*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of families</td>
<td>Total %</td>
</tr>
<tr>
<td>pay compensation</td>
<td>47</td>
<td>11.80</td>
</tr>
<tr>
<td>move out of the Park with compensation</td>
<td>147</td>
<td>36.00</td>
</tr>
<tr>
<td>move to lands outside of the Park</td>
<td>0</td>
<td>0.25</td>
</tr>
<tr>
<td>provide technical assistance</td>
<td>0</td>
<td>0.25</td>
</tr>
<tr>
<td>&quot;no&quot; to resettlement</td>
<td>201</td>
<td>50.80</td>
</tr>
<tr>
<td>total interviewed</td>
<td>397</td>
<td>100.00</td>
</tr>
</tbody>
</table>

* after farmers' organizations had campaigned against resettlement
Source: Cox / Cabruja, 1989.

Point B: A legal commission will draw up the draft of a decree defining the legal status of the present park settlements. Title deeds will then be granted to settlements that do not possess them, through the Agrarian Reform, thus maintaining the regional agreement with the CDF.

Point C: The farmer unions will take part in the internal delimitation of the Park, with the technical participation of the Agrarian Reform and National Settlement Institutes of Santa Cruz.

Point D: The central agreements for commencing negotiations with the CDF-Park consist of four points:

- Soil management: The CDF will provide advice and technical support to the farmers for the conservation and use of lands with steep slopes. High parts of slopes will be protected, as will also the forests on river banks. There will be rational management of woodlands in low areas, providing for reforestation with beneficial plants and the use of land suitable for agriculture.

- Use of resources: Hunting and fishing will be of subsistence type only and not for sporting or commercial purposes; no explosives or chemical products will be used. Livestock-grazing will be rationally planned by the farmer unions so as to benefit the local population. Valuable timber located on the plots of land will be exploited on a family and community basis and will not be marketed.

- Social improvements: The farmer organizations will negotiate with appropriate private and public entities for the construction and improvement of schools and medical stations and to obtain loans.

- Participation in the conservation of Amboró National Park: The farmers will participate actively in the conservation and administration of the park. No new
settlements, or any undertakings that could affect the Park's ecology and environment, will be permitted. There will be participation in the gains made by institutions that work in the Park to achieve the economic and social development of the farmers of the region.

The farmer park guards

The first nine Ambaró park guards were selected from among farmers living in the park who were willing to cooperate in this respect. At first they were the object of threats and pressures from some settlers, but it has nevertheless been possible to negotiate with the farmer unions and achieve a closer relationship between the latter and the park officials. The farmer park guards received training in two courses funded by the foundation Amigos de la Naturaleza (FAN). They were supplied with uniforms and equipment and are currently performing effective supervision duties.

The “red line”

In order to separate the settlement area within the Park from the protection area, a “red line” was defined in 1989. It consists of an unfenced boundary, and in areas with very rugged topography only reference points were marked to show the separation. The establishment and control of this 60 km-long red line was a difficult task, because it was necessary to negotiate with the farmer organizations about the settlers who were doubly affected: first, because they were inside the Park, and second, because part of their lands were behind the line, in the restricted area. The park administration is considering the possibility of offering such farmers other areas so as to avoid further clearing of the high forest.

The installation of the red line had effective results. There was improved coordination between farmers and park administration as far as protection and control are concerned. Now many of them support the Park, provided the Park respects their farms. One of the lessons learned in Ambaró National Park was that neither a red line nor any restricted area can be imposed: it must be defined by consultation and agreement with the farmers.

Conclusion: the Park’s main problems

- The agriculture practiced by the settlers in the Park, based mainly on rice cultivation, employs the traditional method of “slash and burn”. As a result of the deforestation, the rivers are continually contributing to loss of arable land due to erosion, sedimentation and alteration of their basins, apart from endangering neighboring villages outside the Park.
- Farmer participation in park administration and management is still on a very small scale. Until a community participation policy will be established, the management of Amboró National Park will be a difficult task.
- Farmer organizations were not invited to take part in preparing the Park’s management plan. Their collaboration would have been of particular importance in the regulation of settlements and the treatment of the farming zones.
- The agreement between the government and the farmer unions has been accepted by some organizations only; the socio-economic projects that will benefit the farmers have not been prepared; both the social awareness programs and the programs for environmental education and community participation are managed in a top-down fashion and are still in their initial stages, even though they were priority issues in the management plan discussions.
- Research carried out in the Park by national and international institutions is directed largely towards biological inventories and ecological justification, disregarding the socio-economic problems of the inhabitants.
- Funding obtained for park management (Inter-American Development Bank and TNC/FAN’s “Parks in Peril” program) includes only components on biodiversity and physical infrastructure; there are no projects for improving the social and economic conditions of the farmers who live in and around the Park.

*Part of the controversy as published in the Bolivian press*

What is happening in Amboró National Park?

(....) The view of the park from Buena Vista these days consists entirely of a thick cloud of smoke. A flight over the Park reveals a horrifying sight of destruction. There has been an obvious increase in the clearing of virgin forest and river bank areas, and there are signs of aggression against the forests that cover the lower mountain slopes in less accessible areas. All this is occurring in a national park where human settlement is subject to strict regulation. (....) However, public entities have authorized the establishment of settlers. This was not only a crime against the law of nature but also a crime against the settlers’ own welfare, by (illegally) allotting them lands unsuitable for agriculture. This has created a serious social (and ecological) problem, and the future of such peasants will be one of poverty and uncertainty. (....) Another year of such negligence may well add Amboró to the list of parks on the road to extinction. (....) The Friends of Amboró Association (Asociación Amigos del Amboró) asks the population of Santa Cruz and the entire Bolivian people to watch closely what is happening in their protected areas in general and Amboró in particular. It is indeed difficult to believe that an area so valuable and so near to Santa Cruz cannot be protected from abuses that seem to be due more to administrative problems than otherwise.

*Source: Paolo Betiella, Bolivian representative of the Italian NGO “Associazione Amici di Amboró”, in El Deber, October 21, 1990 (Santa Cruz, Bolivia).*
Clarification

In the morning paper El Deber, dated the 9th of this month, and in the Sunday supplement, dated the 22nd, Nino Gandarillo and Paolo Betiella made statements to the effect that some project executives were authorizing settlers or farmers to clear land for cultivation in Amboró National Park. (...) Prior to the negotiations in June between the Government and the farmers regarding penetration in national parks (Amboró, Charraseo Ichilo, Isiboro-Sécure) when the “red line” concept was proposed, the settlers in Amboró National Park had no guarantee as to the tenure of their land, whether granted before or after creation of the Park. In these negotiations the Government defined that the ownership rights of those who had been granted land prior to the designation of the Park must be respected; consequently, if there has been an increase of clearings in the Park, in areas long occupied by peasants, it is due to the fact that the Government took up a definite position regarding land tenure, with the resulting rights and obligations for the peasants. (...) These peasants form part of a social problem that cannot be ignored; the park inhabitants have a right to subsist, and small farming in the areas they occupy is practiced because they have no other production technology, and the State has not offered them a relocation alternative with its minimum of financial resources and supporting infrastructure.

Source: Jaime Solares Landivar, Executive Technical Director, Chimoré-Yacapani Project (MACA-BID), in El Mundo, October 28, 1990 (Santa Cruz, Bolivia).

Clarification of doubts about small farming areas in Amboró National Park

(...) This controversy leads to the clear conclusion that different positions are being taken with regard to preservation of the environment. Government action in dealing with the social problem has been consistent with that of other Amazonian countries, which have declared that social realities cannot be ignored. Leading members of the church, too, have frequently expressed their concern that the conservation policy should not result in a disregard for the dramatic situation of the poor farmers. On the other hand, there are some ultra-conservationists who are so intransigent that they apparently see no other option except the expulsion of the settlers from the parks. Hence they do not understand why a rapid solution cannot be found to this complicated issue as settlements and agriculture.

Source: Special Report, El Mundo, November 1, 1990 (Santa Cruz, Bolivia).
Editorial update: Since 1992, Amboró National Park (ANP), along with all the other Bolivian national parks, is administered by the Ministry of Sustainable Development and the Environment. Nonetheless, due to the scarcity of resources, the decision has been made to delegate the administration of certain parks to private institutions. In the case of ANP, the NGO "Fundación Amigos de la Naturaleza" (FAN), has been put in charge of its management. Some financing was obtained through the PCBB (Proyecto de Conservación de la Biodiversidad y los Ecosistemas de Bolivia), and training has been given to the "farmer park guards".

With respect to the ongoing conflicts between ANP and the local settlers who request to receive land titles, the Ecological Society of Bolivia's Oriente (Asociación Ecológica del Oriente, ASEO) has stated that "There exist rumors that the government will give land titles to families settled within the Park's buffer zone. It is forgotten that these lands are not apt for agriculture, as they include steep slopes and fragile, unproductive terrain. (...) Due to these rumors, the number of squatters has grown, to the point that the illegal occupation of land has reached the 'red line'. (...) The importance of ANP goes beyond its rich biodiversity to include the watersheds of two of the most important rivers in the area. If we allow illegal logging to continue, we will be contributing indirectly to the extinction of ANP. A solution that satisfies the desire of the settlers to own land, while at the same time saving ANP, would be the relocation of these people". To the relief of these conservationists, the minister of Sustainable Development and the Environment, José Guillermo Justiniano, informed the press in October 1994 that "The limits of ANP will continue to follow the natural boundary of the Surutú River" (source: M. T. Vargas / M. L. Garnelo, Secretariat of Communications of ASEO, in: El Día, October 23, 1994, Santa Cruz, Bolivia).
References

Brazil

National system of conservation units
Celsa Salatino Schenkel
Vitor Carlos Kaniak

Legal status of national park inhabitants
Sônia Maria P. Wiedmann

Monte Pascoal National Park: indigenous inhabitants versus conservation units
Sérgio Brant Rocha
Brazil's national system of conservation units

Celso Salatino Schenkel
Vitor Carlos Kaniak

Abstract: The need for a system of conservation units is evident from the deterioration of the environment. It is therefore important for the population to understand Nature and the significance of the natural foundations of life, because conservation units are an investment for the future. In Brazil's case, there is as yet no specific legislation consolidating the above principles. There is, however, specific legislation referring to the different categories of conservation units already consolidated by the establishment of the country's 34 national parks, 23 biological reserves, 21 ecological stations, and 6 ecological reserves, to mention only the units that exclude consumptive uses, which cover an area of 16.6 million hectares or 2% of Brazilian territory. Other categories admit the use of their resources through prior planning, such as the environmental protection areas, the national forests, and the extraction reserves, totaling 16.2 million hectares or 1.9% of Brazilian territory.

The Brazilian Institute for the Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, IBAMA) is the governmental institution in charge of the administration of the federal protected areas. It substitutes the former Brazilian Forestry Development Institute (Instituto Brasileiro do Desenvolvimento Florestal, IBDF), founded in 1967 and responsible for "the enforcement of all legislation relating to renewable natural resources" and "the administration of national parks, national forests, biological reserves, and federal hunting parks".

In 1989, Law 7,735 created the IBAMA for the purpose of planning, coordinating and executing the national policy for the environment and for establishing regulations for the conservation, development, and rational use of renewable natural resources. The basic structure of IBAMA, as provided in a decree of the same year, included among the institute's responsibilities that of "proposing the creation, extinction, or modification of the limits and purposes of conservation units and public forests, as well as furthering their installation and administration."

Present administration of the State conservation units

The IBAMA National Conservation Unit Council (Conselho Nacional de Unidades de Conservação) has arisen from the transformation of the Park Evaluation Council (Conselho de Valorização de Parques, CVP) and its object is to draw up
Table 1

Brazil: national parks

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>National Parks</th>
<th>Location</th>
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<th>Year created</th>
</tr>
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<tbody>
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<tr>
<td>2</td>
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<td>Ceará</td>
<td>567</td>
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<td>Araguacá</td>
<td>Goiás</td>
<td>562,312</td>
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<td>Goiás</td>
<td>131,868</td>
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<tr>
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<td>Piauí</td>
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General guidelines for the policy of creation, evaluation, and use of conservation units. It acts as consultant to the IBAMA presidency and meets two or three times a year on average. It is made up of well-known technical representatives from outside the IBAMA staff, in addition to representatives of various ministries and related IBAMA departments.

Within IBAMA, the administration of the non-consumptive use conservation units is done by the Ecosystems Administration (Diretoria de Ecossistemas) and
that of the consumptive use units is done by the Renewable Natural Resources Administration (Diretoria de Recursos Naturais Renováveis). Conservation unit officers are directed by the unit head, who in turn is under the orders of the IBAMA superintendent in each state. The IBAMA central administration offices, acting both through the superintendencies and directly in the units, produce the rules, technical guidance, resource planning, and action monitoring.

The conservation unit plan

Although it still possesses no specific legislation for its national system of conservation units (Sistema Nacional de Unidades de Conservação, SNUC), Brazil has already taken some steps in that direction. The first step was the publication of the conservation unit plan (1979 and 1982). In addition to technical and scientific criteria for the management of the existing conservation units, proposals backed by

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Biological Reserves</th>
<th>Area in ha</th>
<th>No. on Map</th>
<th>Ecological Stations</th>
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Table 3

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<td><strong>Total</strong></td>
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<td><strong>32,786,000</strong></td>
<td><strong>3.85</strong></td>
<td><strong>152</strong></td>
<td><strong>32,684,372</strong></td>
<td><strong>3.84</strong></td>
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</table>


extensive surveys were presented for the creation of new units, mainly for the vast region of Amazonia. Some of these proposals were put into effect with the creation of conservation units such as the Serra do Divisor National Park and the Biological Reserves of Guarapé (Rondonia), Abufari (Amazonia), and Gurupi (Maranhao).

Another issue addressed in the conservation unit plan was the proposal to define new management categories in order to include in the system areas of national significance and to take into account components of local, regional, and worldwide established management categories, based on studies performed by the IUCN National Parks and Protected Areas Commission.

System of conservation units

Under the direction of IBAMA and through an administrative agreement with FUNATURA (Fundação Pró-Natureza), a proposal was prepared for a system of conservation units, which has already been approved by the National Environment Council (Conselho Nacional de Meio Ambiente, CONAMA) and only requires approval by Congress to be enacted in the form of a law. This document divides conservation unit categories in three different groups, as follows:

- **Group I. Integral Protection Units (Unidades de Proteção Integral):** The resources in Integral Protection Units can only be used non-consumptively, and ecosystems must remain in their natural state with only a minimum of disturbance. Management categories are: biological reserve (reserva biológica); ecological station (estação ecológica); national park (parque nacional); natural monument (monumento natural); and wildlife refuge (refúgio de vida silvestre).

- **Group II. Provisional Management Units (Unidades de Manejo Provisório):** The principal characteristics of this group are the promotion of total protection of
natural resources, even though on a provisional basis; to admit only non-consumptive use of natural resources, except sustainable use by native population; and to ensure that the ecosystems are maintained in their natural state until their future is decided upon. The only category in this group found are the natural resource reserves (reserva de recurso natural).

Group III. Sustainable Use Units (Unidades de Manejo Sustentável): The main aim of this group is to promote protection of natural resources while admitting sustainable consumptive use of at least part of the available resources. The management categories included in this group are: fauna reserve (reserva de fauna); environmental protection area (area de proteção ambiental); national forest (floresta nacional); and extraction reserve (reserva extrativista).

Ecosystem representativity

With all the protection measures adopted to date at both federal and state level, there now exist various superposed subsystems that lack the necessary financial and human resources, with many agrarian problems, and with important omissions in terms of ecosystem representativity.

A conservation unit system should be structured taking into account the national nature conservation objectives established to satisfy to the greatest possible extent all needs relating to the sustainable use of natural resources and the preservation of the national natural land heritage.

The following ecosystems may be defined as having little or no representation in the conservation units: caatinga (arboreal; sertão, seridó, and cariri); “veredas”, pantanal, Araucaria forest, northeastern Atlantic forest, savannas, general countryside, streams in the northeast, and caves, among others.
Principál problems

One of the greatest difficulties in conservation unit management is the problem of land tenure, taking into account that only in 20% of all the area covered by the different categories State ownership has been established. This is one of the most critical issues for the effective management of these units, since enormous financial resources are required to handle it. The longer the time that elapses between the unit’s creation and the actual acquisition or surrender of land, the more difficult it becomes to regulate it, due to the natural revaluation of land prices.

Another critical problem is the scarcity of available human resources in the units themselves. The national average in 1991 was one officer for every 23,000 ha of area (in 1995 in had even dropped to 26,350 ha), but in some places the figure may run as low as one officer for over 500,000 hectares. There is also the need for greater adjustment between infrastructure and maintenance, to combat the minimal availability of financial resources. Since the system concept has not yet been made institutional by appropriate legislation, Brazil urgently needs a true, flexible and modern national system of conservation units to comply with the requirements of society.

Editorial update: At the beginning of 1995, the National System of Conservation Units (SNUC) consisted of 79 units with non-consumptive use and 72 with consumptive use, totalling 32,684,372 ha or 3.84% of the national territory (pers. com. C. Salatino / V. Kaniak, January 1995). Among the new protected areas is one national park: the 1992 declared Serra Geral National Park in the State of Rio Grande do Sul and Santa Catarina. The proposal for the new law No. 2,892 (to strengthen the National System of Conservation Units, SNUC) still has not been enacted. Some people, mostly from the social sciences, look for a concept in order to allow people inside protected areas in general. The Brazilian law, however, is clear about its denial on that and the new law, that still awaits enactment, maintains the position that national parks, biological reserves, and ecological stations do not allow people living inside their boundaries on a permanent base, nor do they allow the consumptive use of resources by these or any other people. Brazil has, of course, other categories that allow human presence, like extractive reserves and environment protection areas, but they cannot and should not replace the stricter categories of protected areas (pers. com. S. Brant, January 1995). The National Center for Sustained Development of Traditional Communities (Centro Nacional do Desenvolvimento Sustentado das Populações Tradicionais, CNPT) that functions within IBAMA, was created especially to foster the concept of extractive reserves. In 1992, for example, a reserve for traditional fishery and marine resource extraction (pesca artesanal e extrativismo marinho) was declared in Santa Catarina. Until January of 1995, nine extractive reserves had been declared in Brazil, eight of which are located in the Amazon region. Another type of conservation unit intended to resolve the conflicts between local population and integral protected areas is the biosphere reserve concept. The largest
biosphere reserve in Brazil was created recently in the Atlantic Forest (Mata Atlântica, 28,000,000 ha) located in several coastal States of Brazil. But it seems that biosphere reserves in Brazil, as they were accepted by UNESCO, are not much more than a title on a piece of paper. The concept seems to be badly used, due to political interests and, according to many Brazilian conservationists, it has lost much of its value for conservation purposes in Brazil (pers. com. S. Brant, January 1995).
Legal status of national park inhabitants
in Brazil

Sônia Maria P. Wiedmann

Abstract: National parks are primarily created to protect Nature. This inevitably results in restrictions and loss of property and usage rights for the local inhabitants. The present article first of all describes the different conflicts that arise between the conservation units and local populations (indigenous groups, invaders, owners, and other occupants). Secondly, it describes the two legal mechanisms for divestment of ownership: public utility and social interest; and lastly, the different legal regimes governing private property in Brazil are presented, as well as specific cases that have been solved in a creative and individual manner.

The fundamental objective of the national park concept is conservation of the environment. It is therefore very important that the protected areas be preserved from the effects of nature degradation, and safeguarded from any artificial interference that could alter their appearance, composition, and evolution. National parks are not just areas with tourist or cultural attractions. It is a flaw of management to show them in this light, submitting them to human and economic pressures that are incompatible with their real purpose.

In achieving the conservation objectives, an effective basic law and an efficient management agency are preliminary conditions for the creation and implementation of national parks. The creation of this special category inevitably results in restrictions and loss of private property rights, and a public agency is required to deal with them in an appropriate legal framework. In Brazil, the Forestry Code (Código Florestal, Law 4,771 dated September 15, 1965) establishes the basis for the creation of these units as follows: “Article 5. The Executive shall create:

a) National, State, and Municipal Parks, and Biological Reserves, with the intent of protecting exceptional attributes of nature, and reconciling integral protection of the flora, fauna, and natural beauties with their use for educational, recreational, and scientific purposes.

b) National, State, and Municipal Forests, for economic, technical, or social purposes, also reserving unforested areas intended for this purpose.

Additional clause: Other than collecting visitors’ entry fees (at least 50% of which shall be reserved to cover the costs of maintenance, control, and improvements in each unit) all forms of exploitation of natural resources are prohibited in the Parks and Biological Reserves created by the government under this article” (new wording given by Law 7,875 dated November 13, 1989).
The parks in existence prior to this law were created based on the former Forestry Code (Articles 10 and 12, Decree 25,793 dated November 23, 1934). Such National Parks are: Itatiaia (1937), Serra dos Orgãos and Ubatara (1939), Aparados da Serra and Araguaia (1959), Emas, Brasilia, Chapada dos Veadeiros, Caparaó, Monte Pascoal, São Joaquim, Sete Cidades, and Tijuca (1961).

No public consultation

Chapter 6 of the Brazilian Constitution, which deals with the environment, establishes the government's obligation to define land areas or their components requiring special protection, regardless of the use that affects the integrity of their attributes (Art. 225). Current legislation provides no specific procedure for the creation of national parks. No legal provisions define the different stages of the creation process, which instead is copied from the general procedures for the creation of property for public use according to common law rules and principles.

The National Park Regulations (Decree 84,017 / 79) contain only two articles of a rather generic nature referring to the need for prior studies. Article 41 provides for the creation of new areas forming part of the National Conservation Unit System, avoiding the establishment of isolated units that do not offer a sufficient guarantee for protection of renewable natural resources. Article 42 establishes the obligation to perform studies of the technical, scientific, and socioeconomic bases. There appear to be no standards or procedures for prior agrarian surveys or analysis of the costs of property divestments. Creation of a national park becomes effective through a presidential decree, based on a proposal from the government agency responsible for environmental protection at the federal level.

From a strictly legal viewpoint, this is an autocratic procedure, and the fact that there is no public consultation only serves to underline its authoritarian nature. In many countries, the creation of a national park involves prior studies and public consultation. Hence, in some cases, the creation of a park becomes much more the result of commitments where environmental protection considerations are eclipsed by local political or economic interests. The irregularly curving boundaries of some parks testify to the complexity of the negotiations involved. A good example of this is the Eastern Pyrenees National Park in France, which was intended to protect the habitat of the Pyrenees bear. Local community pressures were so strong that when the park was finally created the bear's habitat remained outside its limits.

In addition, the Brazilian Constitution provides that any alteration of limits or elimination of a park shall be the subject of a law and is therefore the concern of Congress. The Constitution thus takes a rather authoritarian attitude towards the environment when it states that a decree may only be revoked by a law.

The formation of a national conservationist conscience, and a more liberal trend in environmental policy-making techniques, should lead the government to seek more democratic formulae based on discussion and agreement with the communities involved.
Local populations

The creation of parks cannot be imposed by the authorities on the human populations that live in or around the regions involved. Unfortunate experiences have already shown how important it is that local populations realize that the creation of a park can improve their individual and collective living standards on a medium-term basis.

Payment of compensation to local inhabitants who are directly affected by the creation of parks is a complex problem. One of the greatest obstacles to be overcome is the hostility toward national parks shown by inhabitants, even in developed countries. This negative attitude has psychological and economic reasons. In most cases, local populations who live in national park areas are clearly under the impression that their lands were “stolen” from them, even though they received compensation after lengthy and often complicated negotiations.

From a legal viewpoint, these inhabitants have nothing to claim. In many cases, after seeing the “gold mines” that some parks become, many people who have always lived in neighboring areas feel that the compensation they received was far too small. Even though they did not actually live in the park area itself, they often went there to hunt, to fish, to make charcoal, to gather nuts, rubber, and heart of palm, or for other purposes. They regard this area, where their ancestors have foraged for centuries, as their own property. It is not difficult to understand the local population’s psychological reaction when they see strangers visiting these areas which they are no longer entitled to use.

In tropical regions, indigenous tribes often live in or around the parks. In this case, the problem is whether they should be allowed to continue living there, using the environment in a similar way as the pygmies in the equatorial jungles of Africa, the “negrito” peoples of Mont Apo National Park in Mindanao (Philippines), the Papuans of New Guinea or the aboriginals of Australia. Through hunting, fishing, and gathering, all these peoples use the environment in the same way as wild animals do: without causing destruction, forming a natural part of the ecosystem.

The same cannot be said of the majority of the Brazilian Indians in our conservation units. Even those who live along the amply negotiated boundaries have caused serious damage and problems in the national parks of Brazil.

Araguaia National Park is a case in point. This park, created in 1959 with an area of 562,312 ha, is situated on the island of Bananal, the largest river island in Brazil. It is located in the central-western region and limited by the Araguaia and Javaes Rivers. This region is the home of the Carajas Indians. Through an agreement with FUNAI, the park limits were redefined in 1971: two-thirds of the island became the Araguaia Indigenous Park and only the northern third remained a national park. Both parks were finally delimited by decree in 1984. Meanwhile, members of this indigenous group, ignoring both the agreement and current legislation, invaded the park area and settled there. These Indians, who are quite
"modernized" due to the influence of American missionaries established there since the 1970s, now make contracts to lease national park lands as alternate pasture lands during the rainy season when neighboring ranches are flooded. The cattle trample down the grasslands and deprive the native fauna of their fodder, thus driving them away and destroying them. Although the legal provisions on this subject are quite clear, these Indians continue to commit such violations of the law and no effective action is taken by the authorities in fear of being classified as "anti-indigenous".

In addition to this "impasse" with the local communities, there is another problem: pressure from people who wish to obtain land for agriculture and grazing. From an ecological and economic standpoint, it would be disastrous to use integral protection zones for this purpose, since sooner or later soil compaction and over-use by livestock would cause an ecological disaster, not to mention the economic ruin of the inhabitants. From a socioeconomic viewpoint, however, the regional authorities are finding it very difficult to contain the immense demand for land.

For the future of parks in developing countries it is essential for the inhabitants to understand that the management and development of the parks will be to their benefit and not to their detriment. Meanwhile, since the majority of the inhabitants in the park implementation zone do not see the advantages they can obtain from the existence of the protected area, each occupant should receive fair and timely compensation. This problem demands a flexible solution, since in some cases local animosity may compromise the future of the parks, and this would be an irreparable loss for the region, the country, and the world.

Divestment and indemnity

Divestment of property is an act emanating from government authorities, where a particular item of real property is transferred to the public domain by compulsory assignment. Divestment of property should not be confused with expropriation. In the former, there is no deprivation of ownership, not even of ownership rights, as occurs with expropriation, which has a wider definition and may mean loss or reduction of the estate. Divestment involves only the conversion of ownership as a result of a forced sale due to factors of public interest. The restriction imposed by the divestment of property represents a legally supported obligation in response to public interest, the benefits of which are also shared by the person surrendering his property.

Although the decree creating each park provides for the fair compensation of property and improvements found in the declared area, in actual practice this does not always occur. One of the main factors is the slowness of public authorities in activating the divestment process due to various difficulties. For a better understanding of these difficulties it is first necessary to become acquainted with the legal nature of national parks: They are regulated through the National Parks Regulations
Legal status of national park inhabitants in Brazil

(Regulamento dos Parques Nacionais Brasileiros, Decree No. 84.017 dated September 21, 1979). According to this document, the parks are the property of the State - public property, and therefore, inalienable. Public property may not be the object of commerce, the subject of private ownership or judicial guarantee, and is not subject to the statute of limitations. The parks, therefore, may not be privatized. This means that the private property found within the area of a park at the time of its creation must be acquired by the State at a fair price as determined in accordance with its current owner.

This is the starting point of the agrarian problem that is one of the greatest obstacles to the effective implementation of national parks in Brazil. The Land Divestment Institute (Instituto de Desapropriação) can proceed in two ways:

a) Divestment of property due to public utility or necessity (Desapropriação por utilidade ou necessidade pública, regulated by Decree No. 3365 dated June 21, 1941 and complementary legislation). Among the cases of public utility this decree includes “the preservation and conservation of historical and artistic monuments, either isolated or forming part of urban or rural entities, as well as the action necessary to maintain and enhance their most valuable or characteristic features - in addition to the protection of landscapes and premises specially endowed by nature” (Article 5 k). In this type of action the response may only refer to the price to be paid for the divested property based on an evaluation made at the time. If much time elapses before payment, the price is corrected quarterly according to the official figures. Improvements are also subject to indemnity, including those made after the divestment decree.

b) Divestment of property due to social interest (Desapropriação por interesse social). Article 5 of the Federal Constitution states that: “the law will establish the procedure for divestment of property due to public necessity or utility, or due to social interest, through fair prior compensation in cash, except in the cases provided for in this Constitution.” The exception refers to Article 184 of the Constitution, which states: “The Union may demand the divestment for reasons of social interest (including agrarian reform) of any rural property that is not fulfilling its social function, by means of prior fair indemnity paid in agrarian debt bonds, with clauses preserving their real value, redeemable in up to twenty years as of the second year of issue, the use of which shall be defined by law. Additional Clause One: Useful and necessary improvements shall be indemnified in cash. Additional Clause Two: The decree declaring the property as being of social interest, for agrarian reform purposes, authorizes the Union to propose action for divestment......”

At the same time, Article 186 indicates the need for adequate use of available natural resources and conservation of the environment. The Constitution thus imposes on the Executive Branch the duty of seeing to the fulfillment of the social function of the land, linking this fulfillment, among other conditions, to the conservation of natural resources, for the purpose of achieving greater social benefits and a higher quality of life for the population.
The Executive Branch’s selection of the appropriate legal mechanism for divestment of property in the implementation of conservation units should take into account the agrarian situation found in each park. In parks where there are extensive unexploited estates (latifundia), divestment of property would be for reasons of social interest, with payment in agrarian debt bonds redeemable in 20 years. In more densely populated areas, where the owners live on and derive their sustenance from their land, divestment would be for public utility reasons and compensation would be paid in cash. The use of these criteria would avoid injustice to small rural owners, who should receive the value of their property in cash. The large estates, on the other hand, would have to wait for compensation until the bonds became redeemable. In both cases, there is the problem of title to the private properties, which makes the agrarian regulation process even more difficult. Therefore, there is a need to know the origin of such titles, many of which have doubtful validity.

Different legal systems for private property

Brazilian land occupancy in colonial times was deeply marked by Don João III when he set up the Roman “emphyteusis” (inheritable leasehold) system and divided up the territory into hereditary “captain-generalships” granted to a select group of illustrious persons. This group had the right to use, enjoy, and possess their respective territories. This right, inalienable and transmissible by inheritance, was conferred upon the “emphyteuta” forever, with the obligation to pay a fixed annual leasehold to the direct authority, in this case the government of the Colony. These inheritable leaseholds were redeemable after 20 years by their holder through payment of 20 annual rentals. They were also used for many years in other periods, for example in the last century, when exploitation of natural resources commenced with the extraction of rubber and Brazil nuts in the Amazonas and Pará States. Although such activity was an important economic factor in that period and contributed in great measure to the development of the region, it always involved depredatory action by the people, who only gathered what the jungle placed at their disposal. These title deeds granted rights to a few persons only, while the overwhelming majority of the rubber and Brazil nut gatherers, people of the region who traditionally depended on these activities for their survival, were exploited by the owners, with no rights to the land, without a reasonable wage, and with no social assistance of any kind.

The economic capacity of rubber and Brazil nut forests was evaluated by the number of productive trees in their area. Estates of enormous size thus arose, the typical Amazonian latifundia, based on inheritable leaseholds and extended in an arbitrary manner without the necessary limit definitions. Measurement of the lands described in the inheritable leaseholds invariably reveals areas much larger than those indicated in the original title deeds. Due either to the dimensions of the area,
Brazil. Photo 14: Lagoa do Peixe National Park is an important resting place for migratory birds that feed on the abundant fish and crustaceans in its shallow waters, and is listed as a Wetland of International Importance (Ramsar Site). Photo 15: In Monte Pascoal National Park, that intends to protect some of the last remnants of the Brazilian Atlantic Forest, several fires have been set by the local Pataxó Indians to facilitate timber extraction.
Brazil. Photo 16: The Juréia Ecological Station forms part of the extensive protected area system managed not on the national but instead on the state level in Brazil. It is part of the country's largest biosphere reserve (28,000,000 ha), which was created to conserve the Atlantic Forest (Mata Atlântica). Photo 17: Amazon River, near Manaus. Indian with young capybara (Hydrochaeris hydrochaeris).
or to the doubtful validity of such documents, the fact is that the majority of the conservation units in Brazilian Amazonia contain properties of this type, the acquisition of which hinders the land regulation process in important national parks. Thus even today, when the emphyteusis is regulated by the Brazilian Civil Code, it is an important obstacle to the problem of agrarian regulation in Amazonia.

In colonial times, too, the regents distributed "items of land". This led to the commencement of grants of unoccupied public land for cultivation purposes only, the sale of which was subsequently authorized by law in 1850. The fact that these grants (sesmarias) were made in return for favors or for political reasons, without any cartographic criteria, often led to the overlapping of areas titled to different people.

The most outstanding example of this is Sierra do Bocaina National Park, created in 1971. It has not yet been possible to regulate the situation of this park due to difficulties in identifying title deeds. Bocaina, which has an area of 100,000 hectares and includes a significant part of the Brazilian Atlantic Forest is today a center of social tension, since these colonial properties had long been held by occupants who made improvements and acquired occupancy rights but never received titles.

According to Article 191 of the Brazilian Constitution, usucapion (legal home-steading) occurs after five years of uninterrupted occupancy of an area no larger than fifty hectares. The sole paragraph of Article 191 of the Constitution provides that public land shall not be acquired by usucapion. Moreover, "legal home-steading" is only applicable in Sierra da Bocaina National Park to those who had settled there before the creation of the park itself, since from then onwards the area became public property where no usucapion rights apply.

It is obvious that in many cases the problem resides not only in obtaining financial resources to purchase these units, but also in the difficulty of obtaining a guarantee of what is being purchased, that the sale is being made by the real owner, or that the title is valid.

Another conservation unit with an occupancy history worthy of comment is the Una Biological Reserve. Created in 1980, this reserve is located in the south of Bahia State, where the Atlantic Forest has been almost completely destroyed, leaving only small forest islands, of which Una is one. Special protection is afforded there for a subspecies of the endangered golden-faced Lion Tamarin Monkey (Leontopithecus rosalia chrysomelas). With the intent of protecting this monkey, part of the area was acquired by the former IBDF prior to official creation of the Reserve. Meanwhile, this area was totally occupied by squatters (posseiros) from the region, because demarcation and fencing were not carried out promptly. Recent compensation for improvements made by the squatters has been paid in a special way: the World Wildlife Fund and Conservation International are collecting funds remitted to a Brazilian non-governmental organization for the acquisition of areas that are subsequently donated to IBAMA. This process has made it possible to
indemnify 80% of the squatters of Una Biological Reserve, who had waited years for a solution to this problem which generated so much social tension in the region. The goal is to indemnify all the squatters and thus achieve final enactment of the Reserve.

Conclusion

The legislation governing the conservation units under non-consumptive use (national parks, biological reserves and ecological stations) does not permit human occupancy within their boundaries. Strictly speaking, when a park is created, divestment of property should be executed immediately and fair compensation paid, so as to avoid the social problems that have always arisen since the creation of the first Brazilian national park, Itatiaia (1937), where even today there are still properties to be acquired and owners who are angry about the encumbrance imposed on their property.

The same applies to the squatters, the indigenous populations, and the quilombos (properties that belonged to former black slaves) to be found in different conservation units under the responsibility of IBAMA at the federal level. Worse still, there are no prospects of a solution in the short or medium term, since the financial resources required for divestments and compensations amount to many millions of dollars. Only a firm and continuous political will and the obligation to perform socio-economic studies prior to the creation of such areas with the necessary budget provisions for such social costs, will lead to effective management of the parks without undesirable social impacts.

Editorial update: The proposal for the new law No. 2,892, that was prepared by IBAMA in 1992 to give the National System of Conservation Units (SNUC) a new structure and legal base and was substantially revised in 1994 to include several new categories of conservation units, yet still has not been enacted or passed Congress (pers. com. C. Salatino / V. Kaniak, January 1995).
Abstract: Monte Pascoal National Park is one of the few protected areas in the northeastern part of the Brazilian Atlantic Forest, the most highly endangered ecosystem in Latin America. Although the park is only 22,500 ha in size, it is the largest refuge in this ecosystem. This park has undergone severe destruction in the last twenty years, caused by the indigenous peoples who live within the protected area. While the Indians' rights to their lands and the use of natural resources were being discussed and an analysis was being made as to who were responsible for the changes in customs and economic activities, the local population grew 1196% in 25 years (1965-1990). 25% of the forest that once covered the entire park was felled; timber was exploited even in the sections of virgin forest that still remained, and hunting was carried out throughout the Park. Nevertheless, the indigenous peoples still do not have an acceptable standard of living and depend entirely on assistance from the State agency. Destruction of the National Park continues, and if action is not taken quickly, nothing will remain of the once exuberant Brazilian Atlantic Forest.

At the time when Brazil was discovered by the Europeans, in the XVIth century, the lands along the coast had an almost continuous covering of highly diverse forests, reaching inland as far as the region of present-day Argentina and Paraguay, with a total area of over 1 million km² in Brazil alone (Câmara, 1991). The varied geological and geomorphological features of this vast area deeply influenced the flora and fauna of the region, and are chiefly responsible for its enormous biological diversity. The dense ombrophilous (moist, humidity-loving) forest of the coastal belt has the most exuberant vegetation and a large number of endemic species. Câmara (1991) indicates that of the 1745 arboreal species of all neotropical plant families these forests contain 127, of which 68 are endemic. The proportion of endemism is even greater among the families with no arboreal forms, where it exceeds 75% of the species.

The Atlantic Forest (Mata Atlântica), which is considered to be the most endangered ecosystem in America (Redford, 1989), has its most critical area, as far as conservation is concerned, to the north of the Doce river. Most of the forest that covered this region has been completely destroyed by human action and today, only scattered fragments remain, covering less than 1% of the original area. In all of this region, there are only two relatively strict protected areas larger than 15,000 ha. Both of them were established by the federal government: the Sooretama Biological
Reserve in the State of Espírito Santo, with an area of 24,000 ha, and Monte Pascoal National Park, in the State of Bahia, with 22,500 ha.

Physical and biological characteristics of the park area

Monte Pascoal National Park extends inland from the Atlantic Ocean and is limited to the north and south by rivers running perpendicular to the coast. It has a wide diversity of environments due to the variations in its terrain, which take three basic forms. The highest elevation, Monte Pascoal (547 m), consists of Precambrian rocks (Padua / Coimbra Filho, 1979), whereas the tabuleiros, gently rolling plateaux, that form the transition between the mountains and the coastal plains, developed on tertiary sands of the Barreiras Group. The transition to the coastal plain is sharp, with the formation of cliffs (falesias, the common name for high steep land or rocks at the edge of the sea, due to marine erosion) parallel to the coastline. The plain is composed of sediments of marine-fluvial origin dating from the Quaternary. It contains shallow lagoons, sandbanks, and mudbanks subject to tidal action (Silva et al., 1975). Along the coast, reefs which surface at low tide, evidence ancient holocenic shores.

The local climate is of the humid tropical type, with a mean rainfall of around 1,500 mm distributed throughout the year. The average temperature varies between 21° and 24° C, the hottest month being January and the coldest August (Padua / Coimbra Filho, 1979).

In this region (southern Bahia State and northern Espírito Santo State), the dense ombrophilous forest that is the park’s dominant vegetation has phyto-physionomic and structural features similar to those of the Amazon jungle (Câmara, 1991; IBGE, 1987). It is composed of evergreen trees, and the forest’s higher level consists of great trees with abundant foliage and thick trunks, about 30 meters high emerging from a somewhat lower stratum (around 20 meters high). Lianas and epiphytes are not abundant and there is practically no low gramineous covering. The most characteristic species of this flora are the nitta tree (Parkia pendula), the bicocha tree (Vireola gardneri), the ocotea or giant cinnamon (Ocotea gardneri), rose cedar (Cedrela angustifolia), the macaranduba tree (Manilkara longifolia), and the monkey pot tree (Lecythis pisonis) (IBGE, 1987). The vanishing species of Brazil tree (Caesalpinia echinata) and Brazilian rose-wood (Dalbergia nigra), are also found in the park (Redford, 1989). Shoals and mangrove swamps on the coastal plain, deforested areas with brushwoods in the hilly section, and pioneer vegetation on some parts of Monte Pascoal, complete the local vegetation picture.

Ruschi (1978) compiled a very preliminary list of some 60 species of mammals in the park area; Sick and Ridgely (1978) observed 176 bird species in one week of work. Of the 107 endangered species of mammals and birds of the Atlantic Forest region, at least 20 were observed in the national park by these researchers. These data alone provide an idea of the Park’s faunal wealth.
Map 1

Brazil: Monte Pascoal National Park

Forest Cover, 1974 - 1975

Forest Cover, 1989

- park boundary
- forest cover
- village Barra Velha
The creation of the park

The idea of protecting the Monte Pascoal area arose in the 1930s as a result of the work of a commission set up by the Brazilian government to determine the exact site of the Portuguese discovery. At that time, the southern part of Bahia State was undergoing a period of economic and demographic growth, chiefly as a result of the increased cultivation of cacao (Theobroma cacao) that had commenced at the end of the nineteenth century. Before that time, the region was sparsely populated, concentrating in the towns and villages along the coast. Its economy was based on subsistence agriculture and the exploitation of lumber.

The commission’s proposals included the creation of a national park around Monte Pascoal, which was the first point of Brazilian territory sighted on April 22, 1500 by the fleet of the Portuguese navigator Pedro Alvares Cabral, who is considered to be the discoverer of Brazil. The scribe Pero Vaz de Caminha recorded the event as follows (IBDF / FBCN, 1979):

“...That Sunday, in the afternoon, we sighted land! First a high, round mountain, then other lower mountains to the south; and plains covered with thick forests. The captain named the high mountain Monte Pascoal, and the land, Terra de Vera Cruz...”

It was only in 1943, at the initiative of the federal inspector in Bahia State, that the first protected area, Parque Monumento Monte Pascoal, was established around the historical site on unoccupied State land. The area was larger than what was later to become the national park. As no specific action was taken to implement the Park, its lands were invaded by settlers, mainly in the west, where cacao and coffee plantations were established. An agreement was made with the state government in 1959 to donate the land that made up the monument park to the federal government for the creation of a National Park, provided the exclusion of the more densely populated areas where indemnity costs would have been very high. Monte Pascoal National Park was finally created on November 29, 1961, with an approximate area of 22,500 ha within the boundaries it still has today.

The indigenous population

When the Park was created in 1961, several squatters’ properties, the village of Caraiva and a Pataxó indigenous settlement, named Barra Velha were included. The Pataxó indians are affiliated linguistically to the Macrojé group (GT Interministerial, 1988; Maia / Ramalho Jr., 1973). They originally lived in the south of Bahia State, mainly in the coastal region. Over the centuries, as a result of conflicts with the Portuguese and the expansion of the latter’s occupation, these indigenous population groups decreased in numbers and were split up. There are very few historical records regarding the Pataxós who live in the National Park. According to
Silva et al. (1975), the reports of Prince Wied-Neuwied, who travelled throughout the region in the early nineteenth century, show that the village of Barra Velha, situated within the area of the present National Park, did not exist in 1816. The first proof of the existence of an indigenous village at Barra Velha dates from 1951.

From the analysis of historical documents, however, it would appear that the village must have been established there in the second half of last century. The original core of Pataxó Indians was enlarged by the addition of remnants of other indigenous ethnic groups and, later on, by black people, white people and mestizos of all shades, loosely classified by the Indians in the category of “Portuguese”, as opposed to the “caboclos” (mestizos of white and Indian blood), in which category they include themselves. The village was almost totally destroyed in 1951 when, after a conflict with a local ranch owner stimulated by two strangers who arrived in Barra Velha, the population was repressed by the police, who even burned the village, causing the population to migrate to other regions. Today the group is characterized by an extensive acculturation which has lead to the almost total loss of its original linguistic and cultural heritage (Silva et al., 1975).

Nature conservation and the indigenous population

The late 1950s and early 1960s witnessed increased occupation of the Monte Pascoal region, where there was an intensification of agricultural activities (mainly cacao) as new roads were opened up. Fifty-eight squatters (posseiros) in the Park’s area, concentrated around Monte Pascoal itself and along the banks of the Caraiva river, were removed and indemnified; the payments were concluded in 1962.

Silva et al. (1975) indicate that the park guards had also removed the Pataxós from the region of the tabuleiros, where they practiced slash-and-burn agriculture. Two population groups therefore remained in the area delimited as a National Park by the 1961 decree: the settlement of Caraiva, at the mouth of the river of the same name, in the extreme north-east of the area, and the village of Barra Velha, some kilometers further south, but also near the sea. The park administration attempted to solve this problem by setting aside 250 hectares for Caraiva, which at that time consisted of 56 houses and around 250 inhabitants (Costa, 1963). An area of 210 ha surrounding Barra Velha with 152 inhabitants was defined in 1965 for the Pataxós (Magnanini, 1969). The objective was to try to find a solution and alleviate the problems caused in the Park. Neither of the two propositions were put into effect on a legal basis, however, since the decree defining the Park’s limits was not altered.

Until 1969, the Monte Pascoal guards managed to restrain the activities of the Indians, including pulling up any crops sown secretly outside of the 210 ha area. The Pataxó furtively removed piáçava palm trees (Attalea funifera) and sold their fibers in Caraiva (Silva et al., 1975). They also hunted in the Park, usually with traps, since firearms would reveal their presence. There were conflicts between the
park guards and the trader who bought the piaçava fiber from the Indians. The problem persisted, and conflicts increased between indigenous interests and the Park's conservation objectives.

Then the National Indian Foundation (Fundação Nacional do índio, FUNAI), the government agency responsible for indigenous affairs, began to act in the area. The first effective attempt to solve the problem also dates from that period, when the Brazilian Institute for Forestry Development (Instituto Brasileiro da Desenvolvimento Florestal, IBDF), the state agency responsible for national park management, suggested the acquisition of land in areas bordering the Park, north of the Caraíva river, for relocation of the group (Magnanini, 1969). FUNAI, on the other hand, claimed all of the Park for the Indians. No agreement was reached, but another attempt was later made to settle this issue, and at that time even FUNAI agreed that relocation was a viable and desirable alternative. Maia and Ramalho (1973) state that the commitment to leave an example of an unaltered ecological system to future generations requires the study of alternatives that will not be detrimental either to the Indians or to the natural and cultural heritage of Monte Pascoal National Park. They concluded that the presence of the Indians and the Park were not compatible and that the only possible solution consisted in the relocation of the Indians.

The proposal prepared by the FUNAI technicians provided for relocation of the village towards the north bank of the Caraíva river, in an area of 13,652 ha. However, notwithstanding the Bahia State Government’s willingness to assign the lands claimed for the Pataxós, it was FUNAI itself that finally abandoned the idea, perhaps because financial outlays were necessary to indemnify the squatters and it was easier to continue within the Park, where land tenure had already been regulated by the IBDF.

This would have undoubtedly been the best opportunity for both parties to find a satisfactory solution to the problem. If the opportunity had been taken, the present situation in the region would surely be different, both in terms of the Park and the indigenous community. But there was rhetorical insistence that the Indians had rights to the land, and that they did not devastate the land. So the problems (and the devastation) continued until the IBDF finally agreed, on July 14, 1980, to sign an agreement assigning almost one-third of the national park area (8,627 ha) for the use of the Pataxó community. This measure, which was taken in practice but not legally enforced since the decree defining the park limits was not modified, was expected to settle the problems. Instead, it only served to increase them, because the immediate result was the destruction of the forest that still covered this portion of the Park, and, of course, the conflicts did not cease. The Indians continued to claim possession of the entire Park area and the right to exploit the shellfish and crustaceans of the mangrove swamp that remained within the Park. They went on hunting all kinds of animals throughout the region, and felling and burning new areas of the forest. Clandestine sales of timber to local loggers increased, mainly because practically no forests remained outside of the protected area.
It must be underlined, however, that the IBDF’s decision to assign the land to the Indians was based on the former Brazilian Constitution, which gave priority to indigenous issues over protection of Nature. The new Constitution, in force since 1988, maintains indigenous rights, but also assigns the same degree of importance to the conservation units, prohibiting any activity that could compromise the objectives for which a protected area was created.

In March 1989, during an unusual period of drought in the region, an enormous fire, caused by the inhabitants themselves, swept over the region occupied by the Pataxós and even reached the forests in the part of the Park that they were prohibited from using. Fortunately, the devastation ended when it rained a few days later, just before the fire got completely out of control. It was ascertained at the time that the fire had been caused intentionally, to facilitate lumber exploitation and obtain authorization to cut down and sell the dead trees. Large quantities of tree-trunks, sawed and ready for transport, were discovered at several places inside the National Park. In other places, the forest was not entirely cut but the investigators discovered that lumber of greater economic value had been extracted. Local loggers took advantage of the Pataxós’ “immunity” to exploit timber in the Park without becoming directly involved.

Once more, an attempt was made to find a solution to the conflict of interests: The Brazilian Institute for the Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis; IBAMA), successor of the IBDF and since 1989 responsible for national park administration, suggested that all the lumber that had been found felled should be sold and the money used to acquire agricultural land near the National Park, where the Pataxós could be relocated gradually. Due to the advantages and benefits of living in the Park without obeying its rules, there had been a considerable increase in the population, mainly as a result of immigration of caboclos and other inhabitants of the region from the 1970s onward. In 1990, there were already 2100 “Indian” inhabitants inside the Park, divided among three villages -- an increase of 1,196% in 25 years.

Analysis of remote sensing data shows that in 1975 over 16,000 ha of the Park was covered by forests. It is believed that early this century only a small strip along the coast was not covered by forest vegetation. Alteration was the direct result of human action in the area. The data for 1989 show that almost 5,000 ha of forest cover was removed in the fourteen years that elapsed between the records. The data from the 1984 satellite pictures (not shown on the maps) indicate that deforestation was more intense between 1984 and 1989 and considerably affected the area of ombrophilous forest, in the western region of the tabuleiros. Some areas still showing forest cover in the satellite picture, however, had already been exposed to selective felling of the species of highest economic value. This means that the affected area is even larger. Unfortunately, the rhetoric of the rights of the Indians, that they were innocent of the deforestations, and only the loggers were to blame, once more prevailed over common sense and no action was taken.
Present situation

In all, what remains today is an indigenous population living in poverty, who, despite having exploited a large part of the area for commercial purposes, did not improve their living conditions and remain completely dependent on their protecting agency, FUNAI. Only the loggers profited from the devastation. There is also a mutilated national park, which has lost a large part of its forest cover and its fauna, and whose officers gradually moved away over the years to other locations, disillusioned with what they saw happening to the heritage they had defended with such zeal. The unit thus became more vulnerable than ever, and lumber was even stolen from beside the administration offices during the night.

Although small in size, Monte Pascoal National Park is the largest protected area in northeastern Brazil in the region of the Atlantic Forest, a formation that has almost been wiped off the map by human activities. Its situation is critical, but it can still be saved. Its survival depends basically on balanced decision-making and hard work.

The belief that “at the local level, native peoples keep the use of resources within ecological limits” (Brownrigg, 1985, quoted by Redford, 1989) has served to defend the continued presence of such populations in the strict conservation units. Today, it is a great threat to the national parks of Brazil, and it is a problem that undoubtedly occurs in other countries. A protected area is established forever, at least in theory, and a human community is not static. The situation in Monte Pascoal National Park and its relation to the external socio-economic context affect the way in which the native population makes use of the natural resources, and is also reflected in the difficulty of contending with the problem once the balance is destroyed and interests are modified. Seeger (1982), as quoted by Redford (1989), observed that native peoples in America change much more than animal populations and that attempts to provide subsistence for both of them either in the same place or in limited adjacent territories are often based on the wrong logic.

Human beings are not ‘good’ or ‘bad’ simply because of their origin or stage of evolution. Man who lives in a big city is neither better nor worse, as a person, than an indigenous inhabitant of Amazonia, merely because of that fact. Each has his own set of values, marked by his social environment, and is free to change. Just as the city-dweller, a descendant of the Amazonian Indian may wish to enjoy everything that human development can provide today by way of comfort, pleasure, and facilities. The decision will be his own: it will not be made by those who consider a native community as a living museum that will never change its relations with the environment, the size of its population, or its way of using the natural resources.

Other areas of enormous ecological significance in Brazil that are facing problems similar to those of Monte Pascoal include Araguaia, Pacaás Novos, Amazônia, and Pico de Neblina National Parks, and the Guapore Biological Reserve. Indigenous communities of the Amazon region, too, such as the Kaiapos in Pará.
State, who, although they are located in areas where access is still difficult, have already modified their lifestyle and today exploit the natural resources of their lands as a source of foreign currency.

Protection of conservation units becomes more important every day, since they are gradually turning into islands in a sea of altered areas. Less than 2.5% of Brazil is specifically reserved for the survival of all the non-human living species that inhabit our country. It is too much to ask that this small area should also have to support permanent human occupancy.

**Editorial update:** The conditions in Monte Pascoal National Park are still the same — no action was developed or implemented to solve the conflicts, and the destruction continues. Because of the political aspects involved with the Rio-92 United Nations Conference, FUNAI, the agency in charge of Indian affairs in the federal government, received a lot of support to their land claims for the Indians, and no conservation action that might have led to negative international impact was taken. An Indian Reserve was established inside Monte Pascoal National Park. Now, that conflicts are becoming more serious in a lot of protected areas in Brazil, the government is changing the way they deal with questions of land tenure and establishment of Indian reserves. The problems originated by the impacts of superimposition of Indian reserves over national parks and other categories of strict protected areas will probably be addressed now, and the legal restrictions to the creation of Indian reserves in places already declared protected areas (and vice versa) will be enforced. The example of the Barra Velha Reserve, in Monte Pascoal National Park, and the Yanomami Reserve, that was established over a national park and two national forests along the Brazil / Venezuela border, encourage people to instigate groups of “indians” to invade protected areas, as they did in Superagui National Park, in the southern coast of Brazil (pers. com. S. Brant Rocha, February 1995).
References


FUNATURA (1990): Sistema nacional de Unidades de Conservação. Brasília. (Presented to the Brazilian Congress to be made into a Law, Fundação Pró-Natureza).


Chile

Inhabitants of national parks: characteristics and problems
Pedro Araya
Claudio Cunazza

Legislation on national parks: use of natural resources
Danilo Gutiérrez Vilches
Inhabitants of Chilean national parks: characteristics and problems

Pedro Araya
Claudio Cunazza

Abstract: The National System of Protected Wildland Areas in Chile comprises three management categories: national parks, national reserves, and natural monuments, totaling 79 areas, all administered by the National Forestry Corporation and covering almost 14 million hectares or 18% of the country. 30 of these units are national parks. There are three different types of inhabitants in protected areas: indigenous communities, private landowners, and illegal occupants, totaling 2,022 persons and occupying 5.6% of the parks' total area. The management plans for the units make particular reference to the indigenous communities, for whom a specific type of management is proposed; the case of Volcán Isluga National Park is cited as an example. The different options proposed to deal with the inhabitant problem, especially as regards private owners and illegal occupants, include the application of legal provisions to regulate the use of their lands, the purchase of such lands, and in the case of squatters range from the granting of concessions to relocation in other state-owned areas or even, in extreme cases, eviction.

Today, more than sixty years after the creation of the first Chilean national park, samples of the majority of the country's many natural environments are protected in some thirty national parks. Others will probably be added in the future to further enhance the ecological coverage. National parks (parques nacionales), national reserves (reservas nacionales), and natural monuments (monumentos naturales) are the three types of areas that make up the National System of State Protected Wildland Areas (Sistema Nacional de Áreas Silvestres Protegidas del Estado, SNASPE). Initially the system only consisted of national parks and forestry reserves (reservas forestales), but in 1980 several natural monuments were created, consisting of former national parks which were reclassified. In this revision of the system, the forestry reserves were renamed and changed to the category of national reserve according to a newly adopted definition. Almost 95% of the system's land area consists of totally unoccupied state-owned lands. The administration of this significant portion of Chilean territory (18%) is in the hands of the National Forestry Corporation (Corporación Nacional Forestal, CONAF), a dependency of the Ministry of Agriculture (Ministerio de Agricultura). CONAF has regional offices in each of the 13 administrative regions into which the country is divided, and in most of the regions there are also provincial offices which
are directly responsible for the administration of national parks and other protected areas. On the other hand, the central office has the technical responsibility for the Wildlife Heritage Program (Programa de Patrimonio Silvestre), entrusted to the department of the same name, which acts as adviser to the technical manager and executive director. This Program consists of four projects: protected wildland areas (áreas silvestres protegidas), wild flora (flora silvestre), wild fauna (fauna silvestre), and environmental education and cultural resources (educación ambiental y recursos culturales).

Basic aspects of the national parks

The current definition of a national park is provided in Law N° 18,362 of 1984 as “an area, usually of considerable size, where ecosystems are found that are unique or representative of the natural ecological diversity of the country and without significant alteration by human interference, which are self-perpetuating, and where the flora and fauna species or geological formations are of special educational, scientific or recreational interest.” The objectives of a national park are “the preservation of samples of natural environments and their associated cultural and scenic features; the continuity of evolitional processes and, insofar as they are compatible with the above, the performance of educational, research or recreational activities.”

There are 30 national parks with a total area of 8,358,367 ha, located in 12 of the country’s 13 administrative regions. The largest proportion of parks, in terms of land area, is located in the southern regions (Aysén and Magallanes), with 87% of the total area of national parks in the whole country. The present situation of national parks, as far as their number and area are concerned, is the result of the efforts of a small number of highly-motivated and interested persons who succeeded in convincing the Government to set aside some lands from settlement and create protected areas to preserve their flora, fauna, and scenic beauties. In this way, they also made a contribution to tourism, as referred to in the decree of 1926 that created Vicente Pérez Rosales National Park. This park, which has an area of 250,000 ha, is located in the Los Lagos region and still exists today.

Human occupancy in national parks

When the country’s first national park, the Benjamín Vicuña Mackenna National Park, was created in 1925, the government showed its intention to avoid future occupancy pressures by expressly stating in the decree that “the lands intended for
Inhabitants of Chilean national parks: characteristics and problems

this purpose ... should not be of great value for agricultural uses, since otherwise the creation of Tourism Parks (Parques de Turismo) would not be economical.

Another of the provisions states that no land should be included “that could be used to respond to the Government’s commitments to establish settlers”. Unfortunately, the legislators’ good intentions were soon frustrated. In 1929 a Supreme Decree merged Benjamin Vicuña Mackenna National Park with a neighboring reserve area and thereby included 90,300 ha that had been destined for settlement purposes (Cabeza, 1988). The detailed history of human occupancy in national parks has not yet been duly documented. It is evident, however, that the existence of private property and occupants in national parks has a variety of origins, the most important being:

- Indigenous communities, particularly in the Tarapacá region in the extreme north of the country.
- Creation of units without adequate studies of their resources, which, after more detailed analysis, proved unsuitable for national park purposes.
- Creation of units in private lands or in areas that had been illegally occupied for years.
- The absence of a national system of state-protected wildland areas, which in practice meant the creation of units on paper only, since there were neither the personnel nor the infrastructure to prevent the occupation of such units or even the assignment of part of the protected land to settlers.
- The existence of natural resources of interest to other state institutions, to which parts of protected areas were often assigned with little or no consultation. Some of these lands still form part of the assets of such institutions and others have been sold to private owners.

Recognition of this situation and the desire to settle the problem gradually have led, during the last ten years, to the development of an intense process of verifying the titles and boundaries of the units that comprise the system. This has resulted in reclassifications, redelimitations, and partial or total divestments of properties in a series of national parks.

Nevertheless, although various types of action have been taken since 1980 and several decrees issued, in some parks illegal occupants and private properties still form an obstacle to the fulfillment of the objectives for which such areas have been created. The inhabitants of Chilean national parks can be classified in the following three categories:

- Traditional indigenous communities: isolated groups or small indigenous villages established since pre-columbian times in areas that are now national parks.
- Owners of private property: persons, companies, or state institutions that hold title deeds to areas included in national parks.
- Illegal occupants: settlers who possess no legal title to their lands but who for many years have been using areas of usually small sizes.
Table 1

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>National Parks</th>
<th>Location (Region)</th>
<th>Area in ha</th>
<th>Year created</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lauca</td>
<td>J</td>
<td>137,883</td>
<td>1970</td>
</tr>
<tr>
<td>2</td>
<td>Volcán Islaña</td>
<td>I</td>
<td>174,744</td>
<td>1967</td>
</tr>
<tr>
<td>3</td>
<td>Pan de Azucar</td>
<td>II+III</td>
<td>43,754</td>
<td>1966</td>
</tr>
<tr>
<td>4</td>
<td>Bosque Fray Jorge</td>
<td>IV</td>
<td>9,959</td>
<td>1941</td>
</tr>
<tr>
<td>5</td>
<td>Rapa-Nui</td>
<td>V</td>
<td>6,666</td>
<td>1935</td>
</tr>
<tr>
<td>6</td>
<td>La Campana</td>
<td>V</td>
<td>8,000</td>
<td>1967</td>
</tr>
<tr>
<td>7</td>
<td>Archipiélago de Juan Fernández</td>
<td>V</td>
<td>9,290</td>
<td>1935</td>
</tr>
<tr>
<td>8</td>
<td>El Morado</td>
<td>R M</td>
<td>3,060</td>
<td>1974</td>
</tr>
<tr>
<td>9</td>
<td>Las Palmas de Cocalán</td>
<td>VI</td>
<td>3,709</td>
<td>1972</td>
</tr>
<tr>
<td>10</td>
<td>Laguna del Laja</td>
<td>VIII</td>
<td>11,600</td>
<td>1958</td>
</tr>
<tr>
<td>11</td>
<td>Natuelhúla</td>
<td>IX</td>
<td>5,415</td>
<td>1939</td>
</tr>
<tr>
<td>12</td>
<td>Tolhuaca</td>
<td>IX</td>
<td>6,374</td>
<td>1935</td>
</tr>
<tr>
<td>13</td>
<td>Conguillío</td>
<td>IX</td>
<td>60,832</td>
<td>1950</td>
</tr>
<tr>
<td>14</td>
<td>Huerniquehue</td>
<td>IX</td>
<td>12,500</td>
<td>1967</td>
</tr>
<tr>
<td>15</td>
<td>Villarrica</td>
<td>IX</td>
<td>6,000</td>
<td>1940</td>
</tr>
<tr>
<td>16</td>
<td>Puyehue</td>
<td>X</td>
<td>107,000</td>
<td>1941</td>
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<tr>
<td>17</td>
<td>Vicente Pérez Rosales</td>
<td>X</td>
<td>226,305</td>
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<tr>
<td>18</td>
<td>Alerce Andino</td>
<td>X</td>
<td>39,255</td>
<td>1982</td>
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<tr>
<td>19</td>
<td>Hornopirén</td>
<td>X</td>
<td>48,232</td>
<td>1988</td>
</tr>
<tr>
<td>20</td>
<td>Chiloé</td>
<td>X</td>
<td>43,067</td>
<td>1982</td>
</tr>
<tr>
<td>21</td>
<td>Queulat</td>
<td>XI</td>
<td>154,093</td>
<td>1983</td>
</tr>
<tr>
<td>22</td>
<td>Isla Magdalena</td>
<td>XI</td>
<td>157,640</td>
<td>1983</td>
</tr>
<tr>
<td>23</td>
<td>Isla Guamblín</td>
<td>XI</td>
<td>15,915</td>
<td>1967</td>
</tr>
<tr>
<td>24</td>
<td>Río Simpson</td>
<td>XI</td>
<td>41,490</td>
<td>1967</td>
</tr>
<tr>
<td>25</td>
<td>Laguna San Rafael</td>
<td>XI+XII</td>
<td>1,742,800</td>
<td>1959</td>
</tr>
<tr>
<td>26</td>
<td>Bernardo O'Higgins</td>
<td>XI+XII</td>
<td>1,523,901</td>
<td>1980/85</td>
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<tr>
<td>27</td>
<td>Torres del Paine</td>
<td>XII</td>
<td>161,414</td>
<td>1959</td>
</tr>
<tr>
<td>28</td>
<td>Pali-Aike</td>
<td>XII</td>
<td>3,000</td>
<td>1970</td>
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<tr>
<td>29</td>
<td>Alberto M. de Agostini</td>
<td>XII</td>
<td>1,460,000</td>
<td>1965</td>
</tr>
<tr>
<td>30</td>
<td>Cabo de Hornos</td>
<td>XII</td>
<td>65,993</td>
<td>1945</td>
</tr>
</tbody>
</table>

Indigenous communities

The indigenous communities are basically limited to two national parks in the Tarapacá region of the Chilean altiplano, in the extreme north of the country: Lauca National Park and Volcán Islaña National Park. Due to their location, their whole area has historically been occupied by Aymara communities. Land ownership is based on custom, thus making it difficult to obtain a clear idea of this aspect. Only a few families have valid land titles.

Lauca National Park contains 18 private lots, most of them belonging to Aymara communities, with a total area of 87,583 ha, representing 63.5% of the park area. In addition, eight state-owned lots (with a total area of 35,643 ha) are permanently
Table 2

Chile: national reserves and natural monuments

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Conservation Units</th>
<th>Area in ha</th>
<th>No. on Map</th>
<th>Conservation Units</th>
<th>Area in ha</th>
</tr>
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<tr>
<td>NATIONAL RESERVES</td>
<td></td>
<td></td>
<td>NATIONAL MONUMENTS</td>
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<td></td>
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<td>Cohueque</td>
<td>2,150</td>
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<td>32</td>
<td>Pampa de Tamarugal</td>
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<td>Katatalalí</td>
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<td>33</td>
<td>La Chimba</td>
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<td>58</td>
<td>Lago Carliota</td>
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<td>Pingüino de Humboldt</td>
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<td>59</td>
<td>Lago Cochrane</td>
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<tr>
<td>35</td>
<td>Las Chimichillas</td>
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<td>60</td>
<td>Lago G. Cariyu</td>
<td>178,900</td>
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<tr>
<td>36</td>
<td>Río Blanco</td>
<td>10,175</td>
<td>61</td>
<td>Lago Jenimient</td>
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<td>37</td>
<td>Lago Peñuelas</td>
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<td>Lago las Torres</td>
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<td>Río Clarillo</td>
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<td>63</td>
<td>Lago Roselot</td>
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<td>39</td>
<td>Río de los Cipreses</td>
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<td>Las Guantecos</td>
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<td>40</td>
<td>Federico Albert</td>
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<td>65</td>
<td>Alcaufres</td>
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<td>41</td>
<td>Laguna Torca</td>
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<td>Laguna Parrillar</td>
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<tr>
<td>42</td>
<td>Los Ríos</td>
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<td>67</td>
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<td>43</td>
<td>Ñuble</td>
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<td>Lago Galletué</td>
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<td>Trapananda</td>
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<tr>
<td>46</td>
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<td>Salar de Surire</td>
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<td>Nalcas</td>
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<td>Cerro Nielol</td>
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<tr>
<td>51</td>
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<td>75</td>
<td>Alcece Costero</td>
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<tr>
<td>52</td>
<td>Lago Palena</td>
<td>41,356</td>
<td>76</td>
<td>Dos Lagunas</td>
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</tr>
<tr>
<td>53</td>
<td>Llanquihue</td>
<td>33,972</td>
<td>77</td>
<td>Cinco Hermanas</td>
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<tr>
<td>54</td>
<td>Valdivia</td>
<td>9,327</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Cerro Castillo</td>
<td>179,850</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

occupied by people from the Altiplano. Although no land surveying has been done in Volcán Isluga National Park, it can be affirmed that virtually the whole area of this Park is private property. Part of it is used for farming on an individual basis, while pasture lands are mostly shared by the community. These indigenous communities total 155 persons in Lauca National Park and 200 in Volcán Isluga National Park.

Additionally, there has been occasional illegal occupation of land in Rapa Nui National Park by the native inhabitants of Easter Island. In this context, it should be noted that the island has an area of 18,000 ha, one-third of which is occupied by the Park. The local population lives outside of the Park and there have been only a few sporadic occupancy problems as referred to above. From a legal standpoint, the lands comprising the Park are the property of the State:
Table 3

Chile: number and area of national parks by administrative region

<table>
<thead>
<tr>
<th>Administrative Region</th>
<th>No. of units</th>
<th>Area in ha</th>
<th>% of region</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Tarapacá</td>
<td>2</td>
<td>312,627</td>
<td>5.3</td>
<td>3.7</td>
</tr>
<tr>
<td>II Antofagasta</td>
<td>0.27*</td>
<td>11,790</td>
<td>0.09</td>
<td>0.1</td>
</tr>
<tr>
<td>III Atacama</td>
<td>0.73*</td>
<td>31,964</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>IV Coquimbo</td>
<td>1</td>
<td>9,959</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>V Valparaíso</td>
<td>3</td>
<td>23,775</td>
<td>1.5</td>
<td>0.3</td>
</tr>
<tr>
<td>VI del Libertador, B. O'Higgins</td>
<td>1</td>
<td>3,709</td>
<td>0.2</td>
<td>0.04</td>
</tr>
<tr>
<td>VII Maule</td>
<td>0</td>
<td>0.000</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>VIII Bio Bio</td>
<td>1</td>
<td>11,600</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>IX Araucania</td>
<td>5</td>
<td>147,538</td>
<td>4.6</td>
<td>1.7</td>
</tr>
<tr>
<td>X de los Lagos</td>
<td>5</td>
<td>463,849</td>
<td>6.8</td>
<td>5.5</td>
</tr>
<tr>
<td>XI Aysén</td>
<td>3.26*</td>
<td>3,026,148</td>
<td>27.7</td>
<td>36.2</td>
</tr>
<tr>
<td>XII Magallanes</td>
<td>4.74*</td>
<td>4,312,408</td>
<td>32.6</td>
<td>51.6</td>
</tr>
<tr>
<td>XIII Metropolitana</td>
<td>1</td>
<td>3,000</td>
<td>0.2</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30</td>
<td>8,358,367</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

* fractional numbers refer to parks located on the borders between regions.

Owners of private property

The existence of private property within the boundaries of national parks affects ten units to a certain extent. Such private properties range from very small lots used occasionally for recreational activities to vast areas chiefly used for livestock-grazing and sometimes also for forestry and agriculture. Although the proportion of private property in the parks is usually not significant, sometimes it affects a large part or even all of the units, making effective protection difficult.

With a view to avoiding this type of problem in future, the current laws regulating the inclusion of areas in the SNASPE prohibit the creation of protected areas on privately-owned lands. Consequently, these areas should only be created on state-owned land or by previously acquiring land from the owners. Nevertheless, the area occupied by private property in Chilean national parks is very small, only 1.84% with a total of 1,485 inhabitants. On separating the properties assigned to State institutions, which generally do not interfere with the management of the units, this percentage drops to 0.6%.

The national parks with the most complicated situation with respect to private land tenure are Palmas de Cocalán and Pali Aike, since their entire area is privately-owned. Of the remaining parks, the most outstanding is the Vicente Pérez Rosales National Park, where there are 144 private properties of different sizes throughout
the Park, with 1,298 inhabitants, who basically engage in agriculture and livestock-raising. In the case of Puyehue National Park, there are two large private estates, essentially cattle ranches, with around 100 inhabitants.

**Illegal occupants**

Illegal occupation is a minor problem involving only seven of Chile's national parks. It chiefly includes people who have built houses for recreational purposes and small-scale farmers and ranchers who settled on lands in some units, usually many years ago, when control or vigilance activities were practically non-existent. Approximately 200 persons live in national parks as squatters.

There are really no parks where the illegal occupancy situation has a significant influence on the management of the area. Nevertheless, to prevent these cases from encouraging further occupancy, a solution to these problems must be found. Some alternatives are proposed in a later chapter.

**General problems affecting the park inhabitants**

According to the last population census, taken in 1982, three of the country’s 13 administrative regions are considered to be “predominantly rural” and four “markedly rural”. Thus, 18% of the country’s population (that is, slightly over 2 million people) are rural inhabitants. All Chilean national parks are situated in rural areas. It is therefore essential to recognize the problems that affect the country’s rural communities, since they reflect the realities of the inhabitants or communities that live in national parks and surroundings. Several of these problems are directly related to the use of renewable natural resources, thus confirming a clear interaction with the national parks. To give a clearer view of the rural sector’s situation in Chile, four problems are addressed in greater detail below:
Table 5

Chile: area of private property and number of inhabitants in national parks

<table>
<thead>
<tr>
<th>National Park</th>
<th>No. of inhabitants</th>
<th>Area of unit in ha</th>
<th>Area of private property in ha</th>
<th>% of area of private property in unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Campana</td>
<td>0</td>
<td>8,000</td>
<td>2,000 (a)</td>
<td>25,0</td>
</tr>
<tr>
<td>Palmas de Cocalán</td>
<td>0</td>
<td>3,709</td>
<td>3,709(b)</td>
<td>100,0</td>
</tr>
<tr>
<td>Laguna del Laja</td>
<td>occasional</td>
<td>11,600</td>
<td>1 (c)</td>
<td>0,1</td>
</tr>
<tr>
<td>Conguillio</td>
<td>2</td>
<td>60,832</td>
<td>137 (d)</td>
<td>0,2</td>
</tr>
<tr>
<td>Puyehue</td>
<td>177</td>
<td>107,000</td>
<td>50,275</td>
<td>47,0</td>
</tr>
<tr>
<td>Vicente Pérez Rosales</td>
<td>1,298</td>
<td>226,305</td>
<td>34,337</td>
<td>15,2</td>
</tr>
<tr>
<td>Chiloé</td>
<td>0</td>
<td>43,057</td>
<td>11,405 (d)</td>
<td>26,5</td>
</tr>
<tr>
<td>Queulat</td>
<td>2</td>
<td>154,093</td>
<td>608</td>
<td>0,4</td>
</tr>
<tr>
<td>Pati Aike</td>
<td>0</td>
<td>3,000</td>
<td>3,000 (b)</td>
<td>100,0</td>
</tr>
<tr>
<td>Torres del Paine</td>
<td>6</td>
<td>181,414</td>
<td>43,782 (f)</td>
<td>24,1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,483</strong></td>
<td><strong>1,492,264</strong></td>
<td></td>
<td><strong>1,8</strong></td>
</tr>
</tbody>
</table>

(a) Premises in litigation with private owners
(b) Not administered by National Forestry Corporation
(c) Property of Los Angeles Municipality, Forestry Institute
(d) Three lots belonging to the State's Agriculture and Livestock Service in process of donation to the State
(e) In process of transfer to the State
(f) 90% of this area belongs to the National Forestry Corporation, in process of donation to the State
(g) Percentage in relation to the total area of Chilean national parks

Unemployment. Birthrates in rural regions are higher than in urban areas. Except for brief periods when agricultural labor is in high demand, however, there are many more offers of employment in the towns, and this contributes to the country-to-city migration process. Technical progress and mechanization, which reduce the need for labor, have significantly affected employment in agriculture. The rural sector's participation in employment has decreased spectacularly by 50%. In 1960, 707,000 persons were employed in the rural sector, representing 30% of the country's total employment figure. Rural sector employment in 1985 amounted to 616,000 persons, only 15% of the national employment figure at that date (ODEPLAN, 1985).

Poverty. In the regions classified as predominantly and markedly rural, 51% of the total population live in extreme poverty, the largest proportion of them living in the Regions IV (47%), VI (43%), VII (53%), IX (59%), and XI (44%).

Small farmsteads. Significant features of the Chilean rural sector include the extremely reduced areas available for agriculture, the great number of small properties (minifundios), and the thousands of families who live on them. The great
Table 6

Chile: illegal occupants in national parks

<table>
<thead>
<tr>
<th>National Park</th>
<th>No. of illegal inhabitants</th>
<th>Area of unit in ha</th>
<th>Area occupied in ha</th>
<th>% of area occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Campana</td>
<td>9</td>
<td>8.000</td>
<td>1 house only</td>
<td></td>
</tr>
<tr>
<td>Laguna de Laja</td>
<td>occasional</td>
<td>11.600</td>
<td>houses only</td>
<td></td>
</tr>
<tr>
<td>Puyehue</td>
<td>20</td>
<td>107.600</td>
<td>70</td>
<td>0.07</td>
</tr>
<tr>
<td>Vicente Pérez Rosales</td>
<td>120</td>
<td>226.306</td>
<td>1.500</td>
<td>0.70</td>
</tr>
<tr>
<td>Chiloé</td>
<td>8</td>
<td>44.037</td>
<td>6</td>
<td>0.01</td>
</tr>
<tr>
<td>Queulat</td>
<td>11</td>
<td>154.093</td>
<td>2.361</td>
<td>1.50</td>
</tr>
<tr>
<td>Bernardo O’Higgins</td>
<td>14</td>
<td>3525.901</td>
<td>10.500</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>182</strong></td>
<td><strong>14.437</strong></td>
<td></td>
<td><strong>0.20</strong></td>
</tr>
</tbody>
</table>

* Percent in relation to total area of Chilean national parks.

The majority of these families have very low incomes and lack the necessary technical training and resources for their production to gain access to the market on competitive terms (Comisión Interministerial, 1986). As to the size of their properties, according to COPAGRO (1980), 70% of a total of 305,428 properties in Chile are farms with an area equivalent in production to only one hectare of irrigation in the Maipo Valley. According to the Agricultural Development Institute (Instituto de Desarrollo Agropecuario), out of a total of 425,522 rural families at national level almost 57% are small farmers (minifundistas) and salaried rural workers. In all, their properties only occupy 1.5% of the country’s exploitable agricultural lands.

**Destruction of the environment:** Negative alterations of the environment are already common in most countries of the world. The rural sector in Chile is no exception to this, since rural lands disappear or are modified to make way for the expansion of towns and cities, the construction of public works and industrial facilities of all kinds, often completely alien to rural production. In addition, other actions more directly related to the natural resources of the rural sector, such as forest fires, overgrazing, removal of protective vegetation, the use of land for agriculture and livestock in unsuitable areas, have all contributed significantly to the deterioration of the rural environment. A good indicator of this are the high erosion levels that affect soils all over the country, particularly in regions VI and VII, where more than 50% of the regional area are affected by serious and very serious erosion.

Efforts to combat the destruction of the environment can be made in several ways, for example by training the land cultivators, harmonizing production processes with the environment, and developing a conservationist conscience. In this sense, national parks and protected areas in general can make a significant contribution to solving serious problems of the rural environment. This would also be of
Chile. Photo 18: The grazing of goats is one of the main threats to the fragile vegetation in the high Andes of Southern Chile. Photo 19: Mapuche Indians have been living in remote valleys of the Andes for generations. Araucaria seeds ("pehuén") play such an important role in their traditional diet that they call themselves "pehuén-che" (men of the pehuén).
Chile. Photo 20: Great amounts of native trees and shrubs are cut to produce charcoal. Photos 21/22: In the National Reserve of Ralco, Mapuche Indians and traditional settlers live side by side. Their herds of cattle, sheep, goats, and horses generally graze freely, causing serious problems, especially for the renewal of the endangered araucaria forests.
Table 7

<table>
<thead>
<tr>
<th></th>
<th>No. of inhabitants</th>
<th>Area used in ha</th>
<th>% of total park area used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous communities</td>
<td>355</td>
<td>297,950</td>
<td>3.6</td>
</tr>
<tr>
<td>Private properties</td>
<td>1,485</td>
<td>149,264</td>
<td>1.8</td>
</tr>
<tr>
<td>Illegal occupants</td>
<td>182</td>
<td>14,437</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>2,022</td>
<td>461,651</td>
<td>5.6</td>
</tr>
</tbody>
</table>

benefit to the national parks themselves, since a major part of the perils that threaten them are actually expressions of what is occurring outside of their boundaries in adjacent areas.

Incorporating inhabitants in national park planning:
Volcán Isluga National Park

One of the national parks inhabited by indigenous communities is Volcán Isluga, located in the extreme north of Chile. The National Park has an area of 174,744 ha and a population of 200, mostly of Aymara origin, 160 of whom live in the Altiplano and 40 in the pre-cordillera region. Most of the inhabitants are concentrated at Chapicollo, Enquelga and Carahuano.

Land ownership in the Altiplano is of two types: community and family. In general, pasture lands are community property and agricultural lands are family property. Communal lands support extensive livestock-grazing: llamas, alpacas, and, to a lesser extent, sheep. Agricultural lands in the Altiplano normally are subdivided into family properties which are inherited from generation to generation. The most important crops are quinoa (*Chenopodium quinoa*), some varieties of tubers, and recently, garlic.

The pre-cordillera area of the Park is used by the resident population for agriculture and grazing. There are three villages in the extreme southwest of the Park where terracing is typically used for crops, especially corn. The variety and high quality of their production has maintained to the present their exchange system with Altiplano villages, particularly Isluga. In the winter season, natural prairies in the pre-cordillera are leased to shepherds, mainly from Isluga, who move there with their flocks. In addition to the traditional use of the vegetation for forage, a large number of plants are used for medicinal and food purposes. A study of 52 species of native plants revealed that 20% of them had medicinal use and 15% had food uses (CONAF, 1988).
The park's management plan, which was prepared in 1988 by CONAF professionals and covers a ten-year period, expressly takes into consideration the presence of inhabitants within the Park and their relation to the existing natural resources. Among the objectives, rules, and specific activities contained in the plan's management programs, those most closely related to the Aymara communities are to be found in the Environmental Management Program, Cultural Identity Sub-Program (Programa de Manejo Ambiental, Subprograma de Identidad Cultural), which states: 'Consideration of the socio-cultural characteristics of the Aymara communities within the unit, who have succeeded in living in harmony with their environment and organizing their production process in accordance with the conditions imposed by that environment, together with the respect due to every human activity with its own cultural content, make it imperative that the planning of the unit's development and management should consider their effect on the communities that live there and, as far as possible, create the necessary conditions for reinforcing this ethnic group's cultural identity.' The rules for the involvement of these indigenous inhabitants define the following:

- An effort shall be made to maintain the traditional production organization, consisting basically of camelid and sheep-grazing, and the cultivation of potatoes and quinoa, by orienting and coordinating all management action from other institutions, whether in the form of transfer of technology or otherwise, in accordance with the Park's objectives and the local inhabitants' expectations.
- An evaluation (before and after) shall be made of any innovative action proposed, either as part of the park management or by other institutions.
- Visitors will always be oriented concerning how they should interact with the indigenous people, in order to avoid conflictive situations.
- All management action in the unit shall be carried out bearing in mind the expectations of the resident population.
- Management actions in the unit shall be for the benefit of all and shall not favor any particular communities or persons, or cause conflicts among them.
- Activities directly or indirectly involving local communities shall be considered through the latter's own formal and informal organizations and communication channels.
- The use or manipulation of the population's cultural activities for purposes that are at variance with their true nature shall only be permitted with the consent of those involved.
- Other organizations connected with the population in the unit shall be oriented so that they give due consideration to cultural variables in their programs.

The protected area was divided into six zones of use. One of these is the historical-cultural zone, where the Aymaras live and work and for which specific management objectives and regulations were established. One of the management rules for this zone determines: "Management action in the area should be explained to, and accepted by, the inhabitants, and should respond to their expectations as far as possible."
Prospects and courses of action

The objectives pursued in developing improved integration between national parks and rural communities of indigenous groups, private owners or illegal occupants have been determined based on the relations between these inhabitants and the parks administration, the problems that affect them and the contributions that both of them can make, depending on their own particular features. Possible and appropriate objectives to be attained are:

- Contribute to the creation, development, and maintenance of a conservationist attitude and conscience in rural communities, aimed at reducing or eliminating damage to the environment within, and adjacent to, national parks directly connected with the activities of the rural sector (erosion, forest fires, damage or extraction of endangered species of flora or fauna).
- Contribute to the creation of employment in rural communities, either through concessions or direct hiring in the areas or by encouraging the provision of recreational services for visitors.
- Generate understanding and support of rural communities in relation to the significance, functions and benefits of national parks.
- Create or increase opportunities for access to, and knowledge and enjoyment of, national parks by rural communities, particularly children and young people, through the development of recreational and educational activities.

The need for interaction

National parks are generally situated in rural areas, and experience has shown that permanent influences or interactions of many kinds operate in both directions and affect the characteristics and objectives of such areas. In many cases, the management units occupy a significant proportion of the communal territory, which is the basic administrative and social unit with which the areas must necessarily relate. In addition, most of the direct and indirect permanent benefits generated by protected wildland areas are located or felt in their immediate vicinity (soil and water protection, employment, etc.) This also applies to problems generated outside the unit, as mentioned above.

The definition and objectives of the three categories of wildland areas include public use of them (research, environmental education, recreation) provided that the natural resource and conservation objectives are not affected by such use. In summary, integration between national parks and rural communities is essential not only because of the areas' positive ecological and social effects, particularly in their immediate vicinity, but also because of any adverse effects originating in that vicinity that may thus be prevented or reduced.

Resuming, present and future links between rural communities and national parks may be enhanced by various types of interaction, including:
- hiking and guide services for visitors;
- supply of firewood and basic products in public use areas, brought from outside the units;
- direct employment in the units;
- indirect employment through the performance of services in tourist or other concessions in the units;
- training in techniques for the protection and management of renewable natural resources to be applied in the rural zones surrounding the areas;
- appreciation of the value and significance of national parks, both inside and outside the units.

Opportunities for the enhancement of present links so as to obtain mutual benefits for the communities and national parks occur, among others, in the following units: Pan de Azúcar, Archipiélago Juan Fernández, Rapa Nui, Chiloé, Vicente Pérez Rosales. New links can be established by formulating specific ideas and plans that would enable some rural communities to participate in the regulated management of certain natural resources or to provide services for visitors that are not yet offered. Units where this would be possible include La Campana, Alerce Andino, Hornopirén and Queulat.

Other ways of dealing with the problem of human occupancy

Additional ways of handling the problem of inhabitants in the protected areas may be considered, especially in the case of private owners and illegal occupants who interfere significantly with the unit's objectives.

Private owners

Enforcement of legal dispositions. There are two legal provisions that prohibit or at least regulate the commercial exploitation of private lands situated inside national parks. These are especially useful instruments in cases where the exploitation of the resources in private properties endangers a unit’s objectives. Article III of the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (“Washington Convention”) specifically states: “The resources they (national parks) contain shall not be exploited for commercial profit. ... The Contracting Governments agree to prohibit hunting, killing and capturing of members of the fauna and destruction or collection of representatives of the flora in national parks, except by or under the direction or control of the park authorities, or for duly authorized scientific investigations.” Article 4 of the Chilean law No. 18,378 indicates. “The President of the Republic, subject to a report from the National Tourism Service (Servicio Nacional de Turismo), may, through the Ministry of Agriculture (Ministerio de Agricultura), issue a prohibition to fell trees situated up to one hundred meters from public roads and from the banks of rivers and lakes that
Inhabitants of Chilean national parks: characteristics and problems

are national property for public use, as well as in gorges and other areas not appropriate for agriculture or livestock-grazing, when required for the conservation of touristic wealth. Once such prohibition has been decreed, trees may only be exploited in the manner and conditions established by the Ministry of Agriculture."

A third legal provision, which has already been enacted and is soon to go into effect, specifically addresses the issue of private property in national parks. Article 34 states: “in both, private lands which at the time of enforcement of this law are included within the limits set for a management unit, and those situated within one thousand meters outside the boundaries of the unit, the following actions are prohibited: ... f) Carry out any activity that may cause erosion of soils or sedimentation of watercourses ... g) Execute any other action that affects or endangers the flora, fauna or natural environments existing in the wildland area.”

Acquisition of property. The final solution to the issue of privately-owned lands in national parks and the difficulties caused by their inhabitants is the purchase of such lands by the State. While this solution presents financial problems, the National Forestry Corporation has drawn up a priority list of such properties, and some lands have already been purchased. In the specific case of areas belonging to State institutions, application has been made for their donation to the National Treasury.

Illegal occupants

Although in many cases the situation is quite complex due to the inhabitants’ scant financial resources, several alternatives have been used or are planned for the problem of illegal occupants:

Concessions. The possibility of granting life-time concessions or some other type of legal figure should be studied, particularly in critical cases due to the occupants’ financial situation. At the death of the concessionaire, the land would revert to the national park administration. In such cases, use of the natural resources in the concession area should be subject to regulation.

Relocation. in consultation with the Ministry of National Property (Ministerio de Bienes Nacionales), which administers state-owned lands, and also with the respective municipal authorities, consideration should be given to the possibility of relocating occupants, either on other available state-owned lands or, in the case of those who only occupy houses and small lots, in urban areas.

Eviction. although this is an extreme measure, some occupants possess other lands and certain financial resources, and they could therefore be required to move out of the park lands they occupy. Legal action may even be used if they do not show willingness to cooperate. If this is not done it will set a dangerous precedent for future occupancy.

Institutional agreement. there are a number of park occupants, particularly in the case of state or municipal institutions, the armed forces, and universities, whose
situation should be legalized through some type of concession contract or institutional agreement.

Disencumbrance. In a few cases of lands under private ownership or illegal occupancy which do not possess any ecological values that require protection and management by the State, consideration should be given to the disencumbrance or dismemberment (desafectación) of such areas in the redelimitation process that is still pending in some national parks.

Preventive measures. In addition to the above measures, a number of actions are being undertaken to prevent the expansion of the present illegal occupants and the entry of others that could aggravate the existing problems. Emphasis has been laid on all protection activities in the parks, increasing where possible the number of park guards in conflictive areas or in the vicinity of private property.

Editorial update: Fifty-four of the 83 identified vegetation-formations in Chile are already included within one or more of the protected areas. CONAF is aspiring to including at least one sample of each formation in the SNASPE, which at present covers 18% of the national area (Naranjo, 1994). Since 1991, management plans have been prepared for Laguna Parrillar and Río de las Cipreses National Reserves, as well as for Fray Jorge and Lagoa del Laja National Parks. Two new national reserves have been established: Lago Galletué (1991; 107,540 ha) in the Region of Araucanía, and Trapananda (1992; 2,305 ha) in the Region of Aysén. While Trapananda has no inhabitants, Lago Galletué includes nine indigenous communities, whose economy is based on agriculture and livestock-grazing. At the moment of its creation, the Reserve consisted of 21,000 ha of private lands, 60,000 ha of indigenous communities' land, and 76,520 ha of land belonging to a State agency. On this land, 22 indigenous families had established prior to the creation of the protected area. Due to a mistake, they were told to leave the Reserve according to a legal decision. Since the indigenous group refused to move and the Government had no interest in their forced expulsion, the latter proceeded in buying these lands from their private owners and assigning them to the indigenous occupants by land title. While this problem has been settled, the fact remains, that Lago Galleté National Reserve has been declared in disregard to existing laws, on private lands and before having come to terms with the owners. Therefore, CONAF is now requesting to dissolve this recently declared Reserve, stating that the administration and management of a strict protected area that consists almost entirely of private lands and is inhabited by indigenous communities, is practically impossible. Additionally, the development process required for these inhabitants would not be compatible with the aspirations of a national reserve. Instead CONAF proposes to declare the area a protected tourist area (área de protección turística). This category is usually established on private lands and permits the regulation of the felling of trees in certain areas, like the banks of rivers and lakes, gullies, etc. (pers. com. P. Araya, September 1994).
Chilean legislation on national parks: 
use of natural resources

Danilo Gutiérrez Vilches

Abstract: Chile is recognized as a pioneer in Latin America in the establishment of a legal basis for national parks. Although the legislation on natural protected areas has often been considered inadequate, the country was able to adopt the legal measures necessary to safeguard the natural and cultural heritage and to create a network of national parks. Additionally, management criteria were established that have been perfected through the course of time. In 1984, Law 18,362 was enacted, and although it has not yet been enforced, its principles and concepts have already served to establish a National System of State Protected Wildland Areas as well as more precise and complete orientations for such areas in accordance with international standards. Both current legislation and the 1984 law provide a positive solution for reconciling the parks' basic objective of conservation with the desire for sustained use of natural resources by park inhabitants.

Since 1925, when the first law providing protection for natural resources under the national park concept was enacted (Decree Law 656), over 20 legal texts have been issued on this subject. This abundant legislation, however, was dispersed, ambiguous and contradictory, enacted to address particular situations, based on varying criteria, and lacking in the necessary technical considerations.

Thus there arose a paradox: the enactment in Chile of the first known legislation on the continent intended to protect natural areas, was followed by periods in which it often seemed that little importance was assigned to the parks and their role in preserving the country's natural and cultural heritage, and where concepts and practices contrary to the nature and objectives of the parks were introduced, such as encouraging settlement. Moreover, since 1984 obsolete legislation has remained in force side by side with a modern law which, although issued several years ago, has not yet gone into effect.

Special reference should be made to certain outstanding texts in the development of Chilean legislation on this subject, due to their particular importance in the organization of the country's vast network of national parks, their contribution to the establishment of management concepts and orientations with more scientific criteria, and, in general, since they have served to establish the present system for protection of these natural areas.

These texts are: the Forestry Law (Ley de Bosques) of 1931, the Washington Convention, enforced in 1967, and Law 18,362 of 1984, creating a National System
of State Protected Wildland Areas (Sistema Nacional de Areas Silvestres Protegidas del Estado, SNASPE). Together with the provisions of Decree Law (Decreto Ley) 1,939 of 1977, these laws represent the present legal framework for Chilean national parks. An important contribution was also made when protection of the environment was included in the 1980 Political Constitution, which guaranteed the rights of all citizens to live in a pollution-free environment, thus making it the State's duty to see that this right not be impinged upon and its obligation to safeguard the preservation of Nature.

The 1931 Forestry Law

The Forestry Law was the first legislation in Chile to address national parks, and it is therefore the oldest of all relevant laws in force today. It is contained in Supreme Decree (Decreto Supremo) No. 4363 of 1931 and was promulgated by the Ministry of Lands and Settlement (Ministerio de Tierras y Colonización).

This decree has the force of law because it was issued by the President of the Republic under attributions vested in him by the legislative powers to recast previous legislation regulating exploitation of forests. Its only provisions on the subject refer jointly to national tourism parks (parques nacionales de turismo) and forest reserves (reservas de bosques), which it also calls national parks (parques nacionales) and forestry reserves (reservas forestales).

"In order to regulate timber trading, guarantee the survival of certain tree species, and preserve scenic beauty", this law empowers the President of the Republic to set up forest reserves and national tourism parks on suitable state-owned lands and on privately-owned lands acquired by purchase or expropriation. In addition, such lands may not be used for any other purpose, except under a law, thus guaranteeing the stability of the system of which they form part.

The original provisions of the Forestry Law were again covered under Law 17,286 of 1970, which granted wide administrative powers to the agency in charge of national parks and forest reserves with a view to making better use of these resources. Also, under a modification introduced in 1988 by Law 18,768 the National Forestry Corporation (Corporación Nacional Forestal, CONAF) was entrusted with the administration and control of national parks and forest reserves, although this agency had in fact been performing that function since 1971 through a cooperation agreement with the service in charge at that time.

The chief objections to the above legislation derive from its lack of concepts concerning the nature of national parks and forest reserves. The fact that this law has been in force with these shortcomings for 60 years has led to the creation of several units that did not have the appropriate qualifications or with errors in their classification. Notwithstanding the above objections as to its form and concept, the Forestry Law made it possible for national parks to be created in Chile over several
decades and established certain criteria that served as the basis for the present protection system. Such criteria included the type of property on which national parks may be created, creation by presidential decree, and divestment by law; the objectives for which protected areas are created; the administration of such areas by a specialized agency; and the feasibility of their use by the public.

**The Washington Convention**

Although the Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere (Convención para la Protección de la Fauna, de la Flora y de las Bellezas Escénicas Naturales de los Países de América, signed 1940 in Washington) only went into effect in Chile 27 years after its approval by the Organization of American States (by which time its concepts were probably already outdated) its enforcement had a significant influence on the country’s internal jurisprudence, on introducing a more definite concept of Nature and the role of national parks.

This was instrumental in overcoming ambiguities in the 1931 Forestry Law and in clarifying the erratic application of this law as to the uses and purposes that could be assigned to such areas. Subsequent to the 1931 law, various laws and decrees had permitted the establishment of, and the granting of title deeds to, settlers and other occupants in national parks, thus further weakening the already feeble conservationist purposes of this law. The Convention added several positive elements to the legislation then being applied to national parks:

- it extended the national park concept to cover the preservation of natural resources, objects and regions of national significance by reason of their scenic, historic or scientific value;
- it underlined the inalterable character of national parks by providing that modification of their boundaries or alienation of any part of them may only be carried out by the competent legislative authorities, and prohibiting exploitation of their resources for commercial purposes.

The Washington Convention made an effective contribution to the legislation then being prepared on national parks in Chile by orienting the interest in the preservation of Nature and the environment. More specifically, it made way for a redefinition of the State’s protected wilderness heritage on a more scientific basis.

Since this is an international treaty, the Convention’s rules prohibiting the commercial exploitation of the national parks’ valuable resources have usually prevailed over attempts to carry on extractive activities (such as mining) which are incompatible with the objectives of such areas.

Without overlooking the importance of the part played by the Convention in the regulation and protection of national parks in Chile, there is some justification for the criticism regarding the absence of a set of rules to order and control their management, which limits their application and effectiveness. In this context, a
document analyzing 14 international treaties, "Internal implementation and control
of the fulfillment of treaties underwritten by Chile for protection of the environment
and renewable natural resources" (Weber, 1982) made several recommendations
which are valid for the Washington Convention:
- the establishment of regulations in future conventions that each country can
  apply at once;
- the need to regulate conventions already signed that lack clear operativity
  standards;
- the inclusion of rules providing full access to information on the operativity and
  fulfillment of such conventions.

Decree Law No. 1,939 of 1977

The Decree Law No. 1,939, which was issued for administrative regulation
purposes, in actual practice made little contribution to the legislation applicable to
national parks, since the few references made to the latter generally address the
same aspects dealt with in the 1931 Forestry Law. Due advantage was not taken of
all the information, experience and legislative precedents, including the Washington
Convention, available at the time of its enactment. The following are modifications
of Decree Law No. 1,939 that concern national parks:
- protection of the environment and ecological balance were included among their
  purposes;
- their creation was made subject to prior evaluation by the appropriate govern-
  ment agency;
- previous provisions of 1972 and 1974 were reiterated to the effect that with-
  drawal by presidential decree should be preceded by a favorable report from the
  Ministry of Agriculture;
- administrative rules were modified by providing that parks where occupancy
  and human activities in any way endanger the ecological balance may only be
  assigned or granted for use to government agencies or non-profit organizations
  (such as CONAF) with a view to conservation and protection of the environ-
  ment.

In actual application, the provisions of this law were useful in the protected areas’
redelimitation and reclassification process undertaken in the past ten years.

Additional legislation

Other legal provisions in force were issued gradually as they were required. This
resulted in some legal vacuums and also a lack of clarity as regards their validity
and application. Since such provisions are not of essential importance in the
consolidation of the national park system and its administration and management, a
detailed list is not necessary here. They include:
Decree No. 65 of 1960 regarding settlement and the granting of land titles within national parks;
- Decree No. 15 of 1968 authorizing the confiscation of products originating from illegal exploitation in parks;
- Law 17,288 of 1970 which excludes areas declared national parks from the law on national monuments (monumentos naturales);
- Law 18,248 of 1983 which makes it necessary to obtain the authorization of the regional intendant to perform mining in national parks.

Law 18,362 of 1984 (not in force)

In 1980, the abundance of such obsolete and dispersed legislation on national parks led the National Forestry Corporation to propose the enactment of a law that would regulate matters relating to these and other natural protected areas on an overall basis, in response to the demands of national and international realities regarding the conservation of nature and protection of the environment. This initiative finally resulted in the enactment in 1984 of Law 18,362, creating a National System of State Protected Wildland Areas. This law, which has not yet gone into effect for administrative and financial reasons, defines, among other things:
- general conservation objectives;
- management categories and their objectives: wilderness reserves (reservas de regiones vírgenes), national parks, natural monuments, and national reserves);
- procedures for creating, reclassifying or withdrawing units and modifying their areas and limits;
- administration and control responsibilities of the Ministry of Agriculture, to be performed through the National Corporation for Forestry and Protection of Renewable Natural Resources;
- the obligation to prepare management plans for each unit according to the definitions and objectives of its respective category;
- the powers of officials who perform inspection duties;
- regulation of use concessions;
- infringements of the law and system of penalties;
- legal procedure, public reports and the Corporation’s power to take part in litigation;
- limitations on use of private properties within a unit and for those situated within 1,000 meters of its boundaries.

The fact that the administration and control of wildland areas were entrusted to the National Corporation for Forestry and the Protection of Renewable Natural Resources, an agency created under a previous law whose validity was suspended immediately after its enactment, has also prevented the provisions of that legal entity from going into effect.
Administration of national parks in Chile

This function has been performed by the National Forestry Corporation (CONAF) since 1971, first through a cooperation agreement with the service then entrusted by law with this task and later, since 1988, under legal powers vested in it directly. Generally speaking, the law authorizes CONAF to enter into all kinds of contracts relating to national parks and to fix and charge rates and fees for public access to the units. The administrative activities include park control and maintenance, conservation of the area and its resources, and control of the activities permitted inside the park. The Corporation may also take bids and enter into contracts for the execution of works that are essential for the administration of the areas or for visitors’ facilities, as well as concessions for services relating to board and lodging, supplies, and recreation. It may also make educational and research agreements with both national and international researchers, universities, technical and scientific entities, in addition to the research it undertakes directly.

CONAF’s administrative powers, however, are not as encompassing as they might seem to be. Some years ago, a study performed by Henríquez (1979) stated: “The National Forestry Corporation, the agency entrusted with the legal custody and control of national parks in Chile, is in fact a private corporation and therefore does not possess either the necessary powers and attributions for that purpose or the appropriate supervision and inspection mechanisms, and thus its management often does not obtain effective results.”

This situation still exists today. The National Forestry Corporation does not have sufficient powers to enforce the rules established for the parks in the management plans, because the latter are technical instruments with no punitive force. CONAF’s administration is also hindered by the fact that none of the laws currently in force give a clear definition of what constitute violations in national parks, and thus the only offenses subject to penalty are those referred to in common legislation and dealt with under ordinary procedures. By the same token, the Corporation’s park guards have no authority to search for, or confiscate, weapons or tools and thus take rapid and efficient action to safeguard the integrity of the units. In summary, the entities in charge of the control and administration of national parks in Chile are not fully vested with the appropriate powers, since CONAF is a private law corporation. The solution to this problem lies in the ratification of Law 18,362 of 1984.

Unit management, planning policies, and zoning

The management, use and development of Chilean national parks is performed by the CONAF in accordance with the directions received from the Ministry of Agriculture and the general orientations established in the CONAF manual (1989).

The policies as far as national parks are concerned are based essentially on the concepts and objectives defined in Law 18,362 of 1984: “The term National Park refers to a generally extensive area containing ecosystems that are either unique or
representative of the country’s natural ecological diversity, not significantly altered by human action and self-perpetuating. (...) The objectives of this management category are the preservation of samples of ecosystems and their associated cultural and scenic features; the continuity of evolitional processes and, insofar as they are compatible with the above, the performance of educational, research or recreational activities.”

In accordance with the above definition and objectives, the manual provides standards for the selection of territories to be included in the park system and for their transfer to State ownership under the mechanisms recognized by the legislation; guidelines for the general operation of the units; definition of the personnel responsible for the administration and the manner in which it is organized. The policy document establishes technical criteria for planning at the unit level. Each unit should have a basic “management plan” defining the tasks and activities to be performed, or “management guides” when short-term basic planning is required and it is not possible to develop the plan. In the absence of both instruments, essential works or activities may only be executed with authorization from CONAF’s highest authorities. Planning takes place on three levels, to which a fourth level may occasionally be added:

- management plan: basic planning document covering the entire unit, containing its essential history, objectives, zoning and management programs, and providing general orientation for other planning levels;
- specific plan: detailed planning document covering activities of the same type (programs) from the management plan;
- site plan: detailed planning for a specific area;
- operational plan: planning document indicating activities to be performed and defining basic aspects for their execution (budget and others).

The guidelines recommend that a unit should be divided into different management zones according to its natural and cultural resources, its specific objectives and the possibility of attaining them without damaging such resources. Zoning of Chilean national parks should be based on the following zones: intangible, primitive, cultural resource, extensive use, intensive use, recovery, and special use. Other types of zones may be added depending on the unit’s characteristics and resources.

Any civil works necessary for the administration of the unit or to improve its use should be oriented towards the attainment of its basic objective: the protection of its natural resources. Such works should either be included in the unit’s management plan or have been authorized by CONAF. They should be compatible with the conservation of the area’s resources, combining aesthetic and functional qualities, and making use of typical materials or styles where possible.

Natural and cultural resource management

Natural resource management includes making biogeographical inventories, evaluating land tenure, gathering information for environmental protection tasks and
recreational activities, minimizing the impact on resources or habitats and avoiding alterations to the area's natural state or the conditions governing its natural evolution. The technical policies also provide orientation for management, with particular reference to flora and fauna, soils, water, air, and minerals.

The cultural resource management includes past and present cultural expressions, the knowledge, conservation, study and diffusion of which are of significance for the national heritage and for the integration and identification of Chileans with their national character and the historical legacy to future generations. These expressions consist of archaeological resources, historical or architectural resources, and anthropological or social resources. Of particular interest within this last category are the indigenous communities, their customs and beliefs, and also the rural way of life, handicrafts, and local artistic, religious and folklore activities. The intention is that such cultural expressions and elements should remain within their own units as part of the national cultural heritage associated with natural environments. The removal of cultural artifacts is permitted only with the authorization of CONAF for research, education or restoration purposes. Also, archaeological excavations must be previously authorized by CONAF and the National Monuments Council (Consejo de Monumentos Naturales).

Public use of resources

According to the definition of 'national park', the use of resources depends on the unit's objectives and characteristics. The following types of use are recognized:
- indirect community use, including the parks' contribution to maintaining an unpolluted environment, and protection of resources to be used outside the area;
- non-consumptive use, such as research, or educational and recreational activities based on the unit's natural and cultural resources. With regard to the latter, policies have been established relating to information, environmental education and interpretation, research, recreation, fees, and safety of visitors.

National park occupancy in Chile

A considerable number of parks have a history of human occupancy that has generated problems and jeopardizes the proper functioning of these parks, either because the situation prevents the administration from fulfilling its obligations or because the management objectives are seriously endangered by the occupants' pressure on the area's natural resources. The existence of private properties within national parks and the occupation of state-owned lands declared as parks affected a total of 14 units in 1989, according to a study made by Cunazza (1989). This study provides indications as to the origins of such occupation and its effect on the management of the units involved:
Approximately 63% of Lauca National Park and the entire area of Volcán Isluga National Park consist of privately-owned lands, most of them belonging to Aymara communities.

In Rapa-Nui National Park, there have been sporadic cases of illegal occupation by natives of Easter Island who claim ancestral rights.

The entire area of Las Palmas de Cocalán National Park (3,709 ha) is contained in two private properties, and is therefore not being administered by CONAF.

In the middle of Torres del Paine National Park, a 4,400 ha private estate is situated. Efforts have been made without success to have it transferred to State ownership, not only to prevent it from deteriorating but also because of the problems it creates with domestic livestock.

Other national parks with occupancy problems are: La Campana, Laguna del Laja, Conguillio, Puyehue, Vicente Pérez Rosales, Chiloé, Queulat, Bernardo O’Higgins and Pali Aike.

**Suggested solutions**

Taking into consideration the origins of national park occupancy in Chile, some solutions can be proposed, subject to due investigation of the area’s ecological environments and values and their importance in the system’s representativity. First of all, an evaluation of the resources of interest that exist in the occupied lands should be made, so as to analyze whether or not such resources are adequately represented in the national park system. The information thus obtained could be analyzed by region to have a wider range of options and facilitate decision-making. Any lands which according to the evaluations do not need to be maintained in the national park system should be released from the system through the appropriate legal procedures. Lands requiring legal protection because of their resource features should remain under the park system and their occupancy problems should be dealt with according to the type of occupants:

- people with land titles to their property;
- occupants making temporary use of the land, such as mining;
- illegal occupants; and
- indigenous communities with ancestral rights.

**Private owners**

Privately-owned lands consist of lands to which the occupants or owners hold regular title deeds, this includes lands belonging to municipalities, State agencies, settlers and other private individuals. In the case of occupants who are private owners, the acquisition of such lands by the State should be studied under current legal mechanisms. However, in the case of lands belonging to municipalities and government agencies, the appropriate procedure would be to transfer them to State
ownership so as to bring them under park management. The legal and autonomous nature of municipalities, however, could give rise to difficulties in making such transfers. In this case, it might be possible to agree on an exchange with other state-owned lands or, as a last resort, loan contracts for the longest possible term in favor of the State or CONAF. No problems should arise with the actual occupants of this type of land, since they will usually be guardians or workers with no rights other than the usual labor rights.

In Chile, the Forestry Law of 1931 provides for the establishment of national parks on state-owned lands and on privately-owned lands acquired through purchase or expropriation. Purchase for the State is made through the Ministry of National Property (Ministerio de Bienes Nacionales) under Decree Law 1,939 of 1977. On the other hand, Article 19 of the Political Constitution specifies that expropriation must be authorized by a general or special law. Another possible solution is exchange, which is also carried out through the Ministry of National Property under Decree Law 1,939. In this case, of course, the State would have to own land outside the park suitable for such an exchange.

Temporary occupants engaged in mining

Although the legislation favors mining activities, the performance of such activities in national parks is limited by the Washington Convention and Law 18,248 (Mining Code), within the scope of which the following measures may be taken against occupants engaged in mining:

- Those who do not have explicit legal rights to mine in the area should be evicted.
- In the case of parks created prior to the issue of the current Mining Code (December 13, 1983) or parks established before that date which have been designated “for mining purposes”, proper authorization under Article 17 of such Code should be required from the regional intendant to carry out mining activities there.
- In the case of units with resources of historical or scientific importance, the feasibility of having them designated “sites of historical or scientific interest” should be studied. Under Article 17 of the Mining Code, such designation would make it necessary to obtain a mining permission from the President of the Republic.
- If the respective permits are not granted, mining work should be stopped and legal eviction proceedings instituted; if authorization is granted, strict control should be exercised to maintain the work within its scope.

Illegal occupants

Efforts should be made to remove such occupants through legal proceedings instituted by CONAF under Articles 10 and 11 of the Forestry Law and Articles 15
and 21 of Decree Law 1,939, which authorize that agency to take the necessary protection measures to guarantee the integrity of national parks. The actions taken will depend on the circumstances, with special attention to the socioeconomic situation of those involved. Public or private entities (municipalities, clubs, universities or other occupants) should be asked to vacate the land as soon as possible. If no agreement is reached, legal action should be taken. In the case of persons who occupied the land prior to the creation of the park, an effort should be made to relocate them on other state-owned lands. If this is not possible, they could perhaps be relocated on lands belonging to municipalities or government agencies that authorize the use of land for that purpose. If they occupy only houses or small dwellings, some housing solution might be found in a nearby village with help from the competent services.

If the above actions are not successful, legal eviction measures should be undertaken. In critical socio-economic situations where eviction is not advisable, concessions for use could be granted for the sole benefit of the concessionaire, limited to an area large enough for his subsistence and taking care not to jeopardize the park’s objectives. These concessions would be granted for very long periods, even for life. This would lead not only to the rational and controlled use of resources, in accordance with the rules established in the contract, but also to the restitution of the land on termination of the concession at the concessionaire’s death or for any other reason. Another solution in such cases would be to employ the occupant for the park administration, providing him with housing facilities so that he could surrender the occupied land.

The above solutions do not apply to occupants who have settled in the units subsequent to their declaration as national parks. Such occupants should be evicted through the ordinary proceedings.

Indigenous communities

In the case of communities claiming ancestral rights, solutions should be sought both for those that possess title deeds recognized by common legislation and for those that have no such documents. Due to the social, historical and cultural implications of such situations, the actions proposed for privately-owned property cannot be adopted here. Once it has been established that the area qualifies for designation as a national park, it should no longer be possible to include it in State-owned lands or remove the communities from the lands they have occupied for generations. The solution here should be to make the park’s objectives compatible with the inhabitants’ use of its natural resources.

Involvement of the local population in park management should be encouraged through contacts with their traditional organizations, informing them of the park’s objectives, permitting their cultural expressions, respecting their practices for rational use of the resources and, in general, accepting their customs and way of life.
life. All this should be provided for in the management plans, taking into consideration the community's normal development expectations, subject always to control by the authorities so as to avoid infringements of the objectives of national parks in general or those of the unit concerned in particular. In this effort toward integration, the park administration should also consider wherever possible the direct involvement of the community's inhabitants in park guard work or other employment.

The proposals for this type of occupants can be supported within the framework of current legislation on national parks, particularly the Washington Convention, which permits as an exception the use of an area's natural resources under the supervision of the park authorities (Article III). Moreover, the idea of "conservation" as applied in Chile permits the use of natural resources in such a way as to obtain the greatest sustainable benefit from them, at the same time ensuring that they will meet the needs of future generations. As provided in the Washington Convention, whatever type of resource use is authorized in the national parks, it should never involve commercial exploitation. All activities undertaken to obtain gain or profit in excess of the amount necessary for the subsistence and natural development of the communities involved, are to be considered as being commercial activities.

Conclusion

The establishment of appropriate rules for the administration and management of national parks in Chile is an issue to which CONAF has assigned the highest priority. It has fulfilled this obligation by setting up general policies and specific management plans which aim at obtaining maximum benefits from the parks while respecting their essential nature. Such policies and plans, which are subject to periodic review and updating, have been prepared in the light of nationwide experience acquired in managing such areas for many years, as well as current concepts and orientations at international level duly adapted to the realities of the country in general and each park in particular. The ever-increasing complexity of national park administration means that the preparation of management plans often requires the participation of interdisciplinary teams of specialists, if necessary, from branches of the government outside of CONAF.

These policies and management plans have also addressed the issue of human occupancy in national parks and sought different ways of controlling the effects of such occupancy on the natural resources and values of these areas to prevent them from jeopardizing their basic conservation objectives. Although the problem has a wide variety of origins, in most cases it relates directly or indirectly to deficiencies in national park legislation from the very beginning. Just as the lack of clear and coherent regulations in the past led to the creation of national parks that did not really qualify to form part of the system, today it is becoming difficult to protect the territorial integrity of such areas and achieve their effective management as parks.
In addition to illegal occupancy, such difficulties include lawsuits by the State to establish ownership rights to national park lands or obtain land titles, in addition to the constant pressures to use park lands for mining, agriculture, forestry, fishing, or other productive activities. To deal with all these issues, the country must have appropriate legislation and clear, stable policies to protect its natural heritage. The agency entrusted with their care and management must have sufficient legal and executive powers to take all the preventive and other actions necessary to eliminate disturbances of any kind. The solutions and actions defined with respect to the occupancy of national parks and the resulting use of their resources should eventually form part of the basic management orientations for natural protected areas, with special respect and consideration for indigenous communities with ancestral rights.

**Editorial update:** Until 1994, no changes in specific legislation on national parks have occurred. In 1993, however, the Indigenous Law (Ley Indígena) was enacted that includes regulations directly related to protected areas. In one of its articles it expressly states, that the administration of protected wildland areas located in Indigenous Development Areas (área de desarrollo indígena) should consider the direct participation of indigenous communities in the management process of these areas. For each case, CONAF, in agreement with the Indigenous Development Corporation (Corporación de Desarrollo Indígena, CDI), will establish the form and extent of such participation and of the permitted use of natural resources. Indigenous Development Areas are proposed by the CDI and declared by the Ministry for Planning and Cooperation (Ministerio de Planificación y Cooperación). They are defined as “areas where State agencies will undertake efforts to harmonize the socio-economic development of indigenous communities with their natural surroundings.” For the ethnic group of Rapa Nui on Easter Island, the law determines the creation of a Development Commission (Comisión de Desarrollo de Isla de Pascua). One of its objectives is to collaborate with CONAF in the administration of Rapa Nui National Park, which covers an important part of the island (pers. com. P. Araya, September 1994).

Cabeza, Angel (1988): Aspectos históricos de la legislación forestal vinculada a la conservación: la evolución de las áreas silvestres protegidas de la zona de Villarrica y la creación del primer parque nacional de Chile. Santiago (Workpaper No.101, CONAF).


Saelzer, Federico (1973): La evolución de la legislación forestal chilena. Facultad de Ingeniería Forestal, Universidad Austral de Chile.


Colombia

Human occupancy of national parks: policies and prospects
Carlos Castaño Uribe

Amacayacu National Nature Park: settlement of conflicts between local inhabitants and the park administration
J. Antonio Villa Lapera
Human occupancy of Colombia’s national parks: policies and prospects

Carlos Castaño Uribe

Abstract: Presently, Colombia has 42 areas assigned to the national park system. These are considered the most inviolate territories of the country’s special management areas and consist of four different management categories: national nature parks, fauna and flora sanctuaries, national nature reserves and unique natural areas. They are administered by INDERENA, the Renewable Natural Resources Development Institute, and cover approximately 10% of the territory of Colombia. This chapter reviews the policies of the last five years and the most pressing problems relating to the areas’ legal and illegal human occupants, analyzes the different traditional uses practiced by indigenous communities in 20 of the system areas and, lastly, analyzes Colombia’s experience in other multiple-use protected areas where national parks form core zones for regional development (Integrated Management Districts).

Colombian national parks and the other protected areas that form part of the national system were created to preserve certain biogeographical areas of the country and to conserve the nation’s natural heritage. The national park system is composed of 33 national nature parks (parque nacional natural), 6 flora and fauna sanctuaries (santuario de fauna y flora), 2 national nature reserves (reserva nacional natural), and one unique natural area (área natural única). In all, these areas cover approximately 9,100,000 ha, an area almost equal to that of Costa Rica, representing 10% of the total land area of Colombia.

The development of national park legislation in Colombia dates from 1941, when the government ratified the “Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere” (Washington Convention). The idea of protecting certain areas of the country because of their ecological significance and their great value to the public was manifested in 1948 with the creation of the country’s first protected wilderness area: the Sierra de la Macarena National Reserve. This was followed by the enactment of Law 2 of 1959 which established the basic principles for the creation of national nature parks, declaring them “public use areas” (área de utilidad pública). This Law also provided that all the nation’s snow-covered mountains and the areas around them should be protected, thus setting up seven vast forest reserves (reserva forestal).

The basic rules for the administration, management, and development of protected areas under a national parks system were issued in 1971 in the Statute on
the Reservations of the National Parks System (Estatuto de las Reservaciones del Sistema de Parques Nacionales), by agreement of the board of directors of the newly created National Institute of Renewable Natural Resources and the Environment (Instituto de Desarrollo de los Recursos Naturales Renovables, INDERENA).

Law 23 of 1973 subsequently established the basic principles for the conservation and management of natural resources and granted special powers to the President of Colombia to draw up the Code of Renewable Natural Resources and Protection of the Environment (Código de los Recursos Naturales Renovables y de Protección al Medio Ambiente), which was issued under Decree-Law 2,811 of 1974 and is the principal body of environmental legislation in Colombia.

The code defines the national park system, its purposes, the types of areas included, and formulates general rules for their administration and use. The category of national nature park is defined in Article 329. The code’s rules for the national nature park system are regulated, along with part of Law 23 of 1973 and Law 2 of 1959, through Decree 622 of 1977, which contains a more specific set of rules on protected areas. This decree contains rules on declaration and delimitation; administration, management and development; and use and control of the areas that form part of the national nature park system.

Environmental policy

The government is presently formulating the environmental policy for the 1991-1994 presidential period, and INDERENA and the National Planning Department (Departamento Nacional de Planeación) are jointly preparing the final document for presentation to the National Council for Economic and Social Policy (Consejo Nacional de Política Económica y Social, CONPES) for budget approval.

This is taking place at a very favorable time for conservation, not only because of the government’s current interest in completely reorganizing environmental management in the country but also, and particularly, because of the State’s intention to include some general guidelines on this subject (principles, obligations, and environmental ethics) in the National Constitution (Constitución Nacional). The government has also made a very significant effort to draft a bill to restructure the environmental sector through the creation of the Ministry of Renewable Natural Resources and the Environment (Ministerio de los Recursos Naturales Renovables y del Ambiente).

The Social Economy Plan (Plan de Economía Social) established the general policies and actions of all state entities during the 1987-1990 presidential period. The Plan’s general objective was “to progress simultaneously toward attainment of high and sustainable growth in the GNP and improvement in the quality of life of the lower-income communities and regions.” The Plan’s two basic strategies covered social development and economic growth, each with a series of sectorial
Colombia. Photos 23/24: Amacayaca National Park covers extensive, mostly undisturbed, rainforest areas between the Putumayo and Amazon Rivers, along the border of Colombia with Brazil and Peru. It is the home of Ticuna Indians, who live in small groups of dwellings near the rivers, on hills not subject to flooding.
Colombia. Photos 25/26: In Amacayacu National Park, the Ticuna Indians make their living via shifting cultivation, hunting, fishing, and gathering. Several Ticuna men of the village of Buenos Aires on the Cotuhé River work together to make a dug-out canoe.
programs. A third macroeconomic management strategy provided support and feasibility for the first two.

The social development strategy was based on three central programs: the National Rehabilitation Plan (Plan Nacional de Rehabilitación), the Integrated Rural Development Plan (Plan de Desarrollo Integral Campesino) and the Plan for the Eradication of Extreme Poverty (Plan para la Erradicación de la Pobreza Absoluta). The economic growth strategy sought to establish the conditions for sustainable growth of production and employment by concentrating on priority sectors of production such as agriculture and livestock, industry, petroleum and mining, and construction.

The government's environmental protection policies, with emphasis on the conservation of natural areas, are included in the chapter on Sectorial Programs for Economic Growth (Programas Sectoriales para el Crecimiento Económico), specifically in the part dealing with the agricultural sector. The environmental policies included in the plan focused particularly on the efficient use of hitherto under-exploited natural resources because of their potential contribution to economic development. Rational exploitation of resources was identified as an additional ingredient in ensuring preservation of their production potential to achieve sustainable growth.

Land use planning was proposed for various regions of the country, along with projects on integrated management of renewable natural resources, particularly in the rural sector policy. This resource management included actions relating to the institutional aspects of planning and administration; the evaluation, review, and regulation of Decree-Law 2,811 of 1974; the organization of an information system on ecological risks; and the strengthening of the program of basic and applied research.

In the policies for protected areas, national park programs were focused on the identification and delimitation of national parks, clarification of ownership, and the establishment of specific regulation and integral management plans. Also included were development projects, the national park regulation plan, an information system, environmental training, a conservation and management plan for natural areas, an inter-institutional and international integration plan, the “Green Campaign”, and the environmental protection and control plan.

The National Park Regulation Plan

The National Park Regulation Plan (Plan de Ordenamiento Parques Nacionales) was directed towards the conservation and maintenance of national parks through the execution of management plans, the expansion of educational and recreational programs, and the creation of new national park areas. The plans in progress in the national park system also contribute to the INDERENA research component, which is identified as a priority among the policies listed in the Social Economy Plan.
Map 1

Colombia: protected areas and indigenous territories

- National park
- Other protected area
- National park with indigenous communities
- Other protected area with indigenous communities
## Colombia: national park system

<table>
<thead>
<tr>
<th>No. on Conservation</th>
<th>Map</th>
<th>Location (Departments)</th>
<th>Area in ha</th>
<th>Year created</th>
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<td>NATIONAL NATURE PARKS:</td>
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<tr>
<td>1 Macuira</td>
<td></td>
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</tr>
<tr>
<td>2 Sierra Nevada de Santa Marta</td>
<td>Magdalena, Guajira, Cesar</td>
<td>383,000</td>
<td>1964</td>
<td></td>
</tr>
<tr>
<td>3 Tayrona</td>
<td></td>
<td>Magdalena</td>
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<td>1964</td>
</tr>
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<td>1969</td>
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<tr>
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<td></td>
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<td>1977</td>
</tr>
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<td>1977</td>
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<td>Meta</td>
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<td>Huila</td>
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<td>1968</td>
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<td>25 Amacayaca</td>
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<td>Amazonas</td>
<td>293,500</td>
<td>1975</td>
</tr>
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<td>26 La Paya</td>
<td></td>
<td>Patumayo</td>
<td>422,000</td>
<td>1984</td>
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<td>27 Gorgona</td>
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<td>Caqueta</td>
<td>49,200</td>
<td>1968</td>
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<td>28 Tatamá</td>
<td></td>
<td>Chocó, Valé, Risaralda</td>
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<td>29 Cabornari</td>
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<td>30 Ensenada de Utría</td>
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<td>31 Tinigua</td>
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<td>Meta</td>
<td>201,785</td>
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<td>32 Catatumbo-Bari</td>
<td></td>
<td>Norte de Santander</td>
<td>158,125</td>
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<td>33 Chiribiquete</td>
<td></td>
<td>Caquetá, Guaviare</td>
<td>1,128,000</td>
<td>1989</td>
</tr>
<tr>
<td>34 Old Providence</td>
<td></td>
<td>San Andrés / Providence</td>
<td>will be declared in 1995</td>
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### Table 1b

**Colombia: national park system**

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Conservation Units</th>
<th>Location (Departments)</th>
<th>Area in ha</th>
<th>Year created</th>
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<td>Ciénaga G. de Santa Marta</td>
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<td>35</td>
<td>Los Flamencos</td>
<td>Guajira</td>
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<td>36</td>
<td>Los Colorados</td>
<td>Bolívar</td>
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<td>1977</td>
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<td>37</td>
<td>Iguáque</td>
<td>Boyacá</td>
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<td>38</td>
<td>Isla la Corona</td>
<td>Nariño</td>
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<td>39</td>
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<td>40</td>
<td>Guanenta - Alto Río Fonce</td>
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<td><strong>NATURAL NATURE RESERVES</strong></td>
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<td>Nukak</td>
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<td>41</td>
<td>Puinawai</td>
<td>Guainía</td>
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<td>42</td>
<td>Los Estoraques</td>
<td>Norte de Santander</td>
<td>640</td>
<td>1988</td>
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The extension policy of the National Nature Parks Division (*División de Parques Nacionales Naturales*) includes the following programs (which are currently being developed): the university in the parks, education in the parks, recreation in the parks, park publicity, volunteer park rangers, infrastructure and public use, and community-based conservation of renewable natural resources in buffer zones. By using the reserve areas to promote university research, education, and recreation, these programs seek to contribute to the conservation, perpetuation, maintenance, and understanding of the values inherent to these areas through community development programs.

**A new orientation for environmental policies**

Establishment of a macro-policy for Colombia should be based on two fundamental objectives: conservation of the natural and cultural heritage and rational use of renewable natural resources within the framework of sustainable development. The specific objectives now under discussion in this governmental process of environmental re-evaluation are the following:
- conserve representative samples of the country's different biogeographical areas;
- protect areas considered exceptional because they contain: unique ecosystems, outstanding landscape features, ethnographic or cultural values, endangered
natural communities or species, or feeding and reproductive habitats of wildlife species;
- maintain *in situ* genetic reserves of native species;
- develop facilities for scientific research, particularly research directed towards sustainable development and identification of technical models;
- foster the development of practices for the sustainable use of natural resources;
- promote the recovery of degraded ecosystems;
- provide opportunities for Man to live in harmony with the environment;
- create opportunities for environmental education and recreation (ecotourism) in appropriate areas;
- develop a representative system of management units or categories to achieve proper fulfillment of environmental policy objectives;
- limit human impacts on Amazonian ecosystems to a level compatible with their carrying capacity.

This re-organization of institutional policy seeks to emphasize two indisputable aspects: the natural heritage as the property of the Nation and its citizens, and the role of biodiversity in the re-orientation of the country's economic and foreign policy.

Biodiversity is life's response to the environmental conditions with varying degrees of imposed limitations, resulting in different levels of speciation, which in the case of Colombia, are of great significance due to its complex geological, climatic, geographical, and evolutionary history. The term biodiversity refers to Nature's degree of variety which includes both the number and frequency of ecosystems and species and the total of all genetic information contained in the genes of plants, animals, and microorganisms at a given place.

From this point of view, Colombia is undoubtedly one of the richest countries in the world in terms of biodiversity, since it possesses 10-12% of the world's species of fauna and flora. But "diversity" as a concept and methodological framework for political strategies for the country and the national park system should not only be identified solely with biological "values" (of genes, species, and ecosystems), but also with the cultural and ethnic values in which Colombia is also one of the most diversified countries.

Cultural diversity cannot and should not be understood as a resource that is independent of, and distinguishable from, its natural surroundings. Although such surroundings are determined by historical and social factors, it is the environment itself that has served to produce this cultural differentiation and this complex mosaic of human adaptations.

As far as protected areas are concerned, one of the objectives of establishing national nature reserves, national parks, and wildlife sanctuaries is the perpetuation of historical and cultural values. Since the legislation does not make such areas incompatible with indigenous settlements, the national parks system should contribute to the survival of these cultural expressions of the national heritage.
Management problems relating to human occupancy

Occupation of areas that form part of the national nature park system, both by individuals and by government projects, has become the most significant threat to the ecological balance of areas whose biological, physiographic, and genetic features make them extremely fragile and vulnerable. Although the quantitative and qualitative extent of such occupancy are not well known, improvement of this situation is one of the principal objectives of the parks administration, since it is the best way to ensure fulfillment of the purposes for which the protected areas were created.

Landowners, illegal occupants, and “narcoguerrilla”

As Table 2 shows, private occupancy of the park system’s 42 areas is indeed critical. The status of occupancy is well known in only 13% of the areas, namely Tayrona, Amacayacu, Nevados and Utria National Nature Parks, for which studies of land tenure have been done. General information is available for 58% of the areas, as gathered by park officers or as part of the research for the preparation of management plans. Finally, there is no information at all on human occupancy for 24% of the areas, mostly because INDERENA is not present in these protected areas due to lack of financial resources.

The area occupied by settlers and owners is estimated at 8.68% of the total land area of the system, that is, at least 700,000 ha. The occupants consist of over 4,750 low-income families and 87 families with higher incomes. Since their very creation, many national parks overlap with privately owned lands, but the State has made little effort to settle the problem of such occupants, who should receive compensation for their properties that were included within the park limits, based on appraisals by the Agustín Codazzi Geographical Institute.

There are also other occupants who, unaware of the protected area’s boundaries, settle inside the area and carry out substantial alterations to the soil, which the State calls “improvements”. These settlers, who could be called “settlers in good faith”, are a result of pressures generated by Colombia’s rapid demographic growth and the demand for land. Another type of settlers, who could be referred to as “settlers in bad faith”, invade the park or reserved area even though they are aware of its boundaries, with the intent of making improvements, thus creating a de facto situation for the State and obliging it to negotiate to the invader’s benefit.

A preliminary balance sheet of all these problems indicates that at least 86% of the conservation units show acute settlement impacts, the most seriously affected being Sierra Nevada de Santa Marta, Sierra de La Macarena, La Paya, Isla de Salamanca, Sanquinga, El Cocuy,Paramillo, Las Orquídeas, Sumapaz, Cordillera de los Picachos, and Farallones de Cali. Drug trafficking and narcotic plant cultivation have also given rise to significant problems in Tayrona, Sierra Nevada,
Table 2

<table>
<thead>
<tr>
<th>Conservation Units</th>
<th>Area occupied by settlers or owners</th>
<th>No. of families establ.</th>
<th>Hunting</th>
<th>Fishing</th>
<th>Burning</th>
<th>Lawlessness</th>
<th>Logging</th>
<th>Drug Traffic</th>
<th>Public Works</th>
<th>Mining</th>
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</tr>
<tr>
<td>Macuira</td>
<td>0.00 %</td>
<td>0</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Sierra Nevada de Santa Marta</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Isla de Salamanca</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td></td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>Nevado del Huila</td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>Sanquinga</td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<td>Los Estomipes</td>
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<td>x</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>8,759</strong></td>
<td><strong>12</strong></td>
<td><strong>9</strong></td>
<td><strong>28</strong></td>
<td><strong>30</strong></td>
<td><strong>33</strong></td>
<td><strong>16</strong></td>
<td><strong>25</strong></td>
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</table>
Ciénaga Grande, Amacayacu, Macarena, and La Paya, where the lives of some INDERENA officials have even been threatened.

The most serious problem, however, is political violence, which makes management of these areas difficult, and in some cases, totally ineffective. Political violence resulted in the destruction, explosion, or burning of ranger stations in Cueva de Guácharos, Tamá, and El Cocuy. In Orquídeas, Tayrona, and Tamá, there were cases of pillaging and threats to officers, and in at least 22 units, there have been direct confrontations between guerrillas and the Army.

Since 1989, the national park system has worked on consolidating management policies for human communities and achieving compatibility of interests. Work has been done on developing terms of reference for buffer zone management and on the legal and conceptual establishment of the Integrated Management Districts (Distrito de Manejo Integrado). The necessary contacts were made in the National Planning Department and other government entities in order to program the required financial and technical resources.

**Impacts of other government projects**

Another form of occupation in the national park areas results from the construction and operation of government projects, such as roads, power stations, and organized settlements. In most cases, these projects do not recognize the existence, legal status, or regulations of the national parks system, and construction is generally begun without consulting INDERENA so as to cooperate in seeking alternatives with fewer environmental and social costs. Although national parks are usually located at some distance from urban centers, they can still be affected by urban pollution. For example, Corales del Rosario National Park's submerged coral reefs are endangered by sewage from the cities located on Cartagena Bay. Infrastructural projects are sometimes planned without taking into account the parks. These projects include roads to be built through certain parks and hydro-electric dams that would flood others. A typical example of this is a road which was planned to run right through Chingaza National Park, and would have been the only access road to San Juanito, an isolated village in the Meta Department. The parks are also subjected to pollution from the herbicides used by State agencies to eradicate marijuana and coca plantations, especially in Sierra Nevada de Santa Marta.

In summary, the direct and indirect problems caused by civil works and mega-projects include: settlement in 30 of the 42 protected areas; hunting and fishing in 32; and burning and extraction of timber in at least 30. Of equal or greater significance is the “lawlessness” found in 20 areas; narcotic drug cultivation or traffic in 16 areas, which creates serious problems for the administration and management of the units and even seriously endangers the lives of park officers. Another problem is mining, which is carried on in at least 6 units, and public works that have generated irreversible expansion of the agriculture and livestock-grazing in at least 24 areas (see Table 2).
Indigenous communities: legal occupation of national nature parks

Colombia has 81 different ethnic groups, which belong to 18 linguistic families and are very diverse in terms of their material, spiritual, and cultural expressions. These ethnic groups (which speak over 1,068 different dialects) are distributed throughout 27 of the country's 32 political-administrative divisions.

Colombia is one of the countries that have shown the greatest interest and desire to recognize the rights of indigenous communities in recent years, and many measures for their protection are now established in law. The history of this approach to the indigenous problem can be summarized as follows:

- 1810-1850: an integrationist policy, aimed at destroying the resguardos (territories owned by indigenous communities) that existed in colonial times.
- 1850-1886: a policy of integration of indigenous communities, influenced by radical liberalism, aiming at the total integration of such communities into national life.
- 1886-1890: during the government of Rafael Nuñez, an agreement was made with the Catholic Church, and indigenous affairs were returned to the hands of the clergy.
- 1890-1950: Law 89, enacted in 1890, indicated how the "savages" were to be converted to civilization. Although this law was discriminatory and racist, it established important principles, such as the non-application of the general laws of the Republic to such savages.
- 1950-1958: the political violence that broke out during this period led to an intense migration of poor farmers to indigenous regions where there was no violence.
- 1958-1990: important laws affecting the indigenous question were enacted during this period, such as the Agricultural Development Law (Ley de Fomento Agropecuario) and the Agrarian Social Reform Law (Ley de Reforma Social Agraria).

As indicated by Walshburger, an indigenous territory can be viewed from three perspectives: the indigenous peoples' own viewpoint, the legal viewpoint, and the ecological viewpoint. Generally, to be able to acquire ownership of land it is necessary to transform its ecosystem in some way. The indigenous conception of territory, however, is quite different. For these people, there is a mythical territory and an ethnic territory, each of which having definite and limited resources. A basic concept in indigenous territories is the critical minimum area, and consideration should thus be given to protected areas that are used by indigenous communities.

As far as natural resources are concerned, there is no legal incompatibility in Colombia between special management areas like national parks and nature reserves and the indigenous territories, and these may exist simultaneously, as stated in the Natural Resources Code (Código de Recursos Naturales) and Decree 622 of 1977 which regulates national parks. Twenty of the 42 areas in the national park system have indigenous people present within their boundaries. Many of these communities
are established in formally constituted resguardos (lands owned and administrated by indigenous communities) or reserves (state-owned lands managed for indigenous peoples).

The existing 31 resguardos and 1 reserve have a total area of over 9 million hectares and overlap the protected areas to a great extent (83%), such that the protected areas of Colombia are the home to over 73,000 indigenous people of 36 different ethnic groups (see Table 3). These communities exert pressure on natural resources, and the strength of this impact increases with the difficulty of maintaining their traditional subsistence lifestyles, due to unavailability of "critical minimum areas" for their subsistence, and their degree of acculturation. In many cases, damage to the environment has become serious. Furthermore, the situation will continue to deteriorate in coming years as the indigenous population grows and acculturation increases their willingness to assume capitalist economic models.

**Integrated Management Districts**

Decree 1974, issued on August 31, 1989, gave legal authority, for the first time in Colombia, to a long-standing project in both national and international forums. This decree promotes sustainable development through the establishment of Integrated Management Districts (Distrito de Manejo Integrado, DMI), which, together with the national park system, water conservation districts (distrito de conservación de aguas) and soil conservation districts (distrito de conservación de suelos), constitute land zoning units and, as land-use categories, give real significance to the special management areas provided for in the code.

The DMIs fill an enormous legal, technical, and administrative vacuum, because it is only through this type of mechanism that vital areas can be managed in a systematic and rational manner. A DMI is defined as an area of the biosphere that is delimited, for environmental or socio-economic reasons, so as to permit planning and regulation of the sustainable use and management of the area's renewable natural resources.

This legal mechanism was applied for the first time in Colombia to the La Macarena Special Management Area (área de manejo especial). Located at the convergence of the Andean, Orinoco, and Amazon biological regions, the area supports a great diversity of flora and fauna, including many endemic species, and is clearly worth protecting for future generations. Decree 1,989 of September 1989, made it possible to execute a complex environmental regulation plan covering an area of approximately 3,400,000 ha, including 2,024,125 ha in DMIs and four protected areas belonging to the national park system (Macarena, Tinigua, Sumapáz and Picachos).

Several years of research led to the proposal for creation of the Special Management Area, in order to reconcile two pressing needs: the conservation of a site with exceedingly rich biological diversity, and attention to the urgent social and economic
Table 3

<table>
<thead>
<tr>
<th>Protected Areas (P.A.)</th>
<th>Indigenous &quot;Resguardo&quot; (I.R.)</th>
<th>Total I.R. area in ha</th>
<th>I.R.'s % of total P.A.</th>
<th>Ethnic Group</th>
<th>No. of Persons</th>
<th>No. of Families</th>
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needs of the nearly 25,000 people who have settled in the area since 1948. The intensification of conflicts is the result of many still unresolved socio-economic problems, which the government expects to minimize with this new type of management. The numerous technical arguments in support of Decree 1,989, which
established the Special Management Area of La Macarena and its internal land zoning, include the following:

Ecological. Compatibility between natural resource conservation and human resource use is sought, and management should be based on the principles of sustainable development, through a spatial analysis of environmental supply and potential demand.

Agronomic. Use of the soil should be planned according to the potential in each of the different ecosystems and geological formations. Zoning includes protection of slopes and poor soils, and further aims at the recovery of degraded soils, use of recent alluvial soils, terraces, and high plateaus. The development of fish-farming and other agricultural techniques as options for the progress of the inhabitants is also promoted.

Socio-economic. The basic aim is to improve the quality of life of the area’s inhabitants by reconciling the scant supply of land with the high demand, thus reducing settlement pressures on the reserve. This can be done by setting up a buffer zone around the protected areas and also through education, extension, and training on the appropriate use of natural resources, by the Technical Agricultural Institutes (Institutos Técnicos Agrícolas), SENA, and other government and non-governmental entities.

Political. Formulas for negotiating with local populations and their organizations should be identified. Provision of state services, strengthening of pacification processes, development of the area, and the formation of an organization to promote the conservation of renewable natural resources may be possible approaches. The idea is to coordinate institutional, national, regional, and local interests in taking integrated action for development.

This law provides the best option for the conservation of strictly protected zones, since it responds to the need for rational use of resources and proposes specific solutions for social conflicts. Its application can be considered to have initiated a new phase in the management of Colombia’s renewable natural resources. It has the support of the scientists on the Colombian Ecological Society’s National Committee for Research on Amazonia (Comité Nacional de Investigación de la Amazonia, Sociedad Colombiana de Ecología), as well as that of conservation NGOs. The most important factor in the development and application of this law, however, is the support of the poor farming community that has lived in the region for 30 years, which has given almost unanimous support to the application of this first model of directed sustainable development in the country.

Two years of experience in programs and projects developed in the light of the Macarena Integral Management District have shown the urgent need to declare other DMIs in other parts of the country where growing environmental deterioration is evident. Thus, DMIs are being planned for the Serranía de Perijá, the San Andrés
Archipiélago, and the Bahía de Málaga, all of which contain national parks. Last, but not least, the possibility is being studied of declaring DMIs as a type of buffer zone around all the national parks, thus assigning to national parks the role of core zones and strengthening their management.

**Editorial update:** In December 1993, the Ministry of the Environment (Ministerio del Medio Ambiente) was created by the Government and the Congress (Law 99). The autonomous Special Administration Unit for the National Park System (Unidad Administrativa Especial del Sistema de Parques Nacionales), a branch of the Ministry, managed to increase government funding by 900%, and international cooperative support by 700%. Two new protected areas have been declared in Colombia in the last few years: Old Providence National Park in the Archipiélago de San Andrés y Providencia, and the 10,000-ha Guanenta-Alto Rio Fonce Flora and Fauna Sanctuary in the Department of Santander. The first phase of Colombia’s National Strategy for the Conservation and Sustainable Use of Biodiversity (Estrategia Nacional para la Conservación y Uso Sostenible de la Biodiversidad) was launched by the President on the 5th of July, 1993. It includes four components: a national biodiversity study, biodiversity and genetic resources legislation, a strategy for management of the national park system, and a forestry policy. For the final formulation of this strategy, the President set up a coordinating committee, in which state agencies and NGOs participated, as well as a technical secretariat which, amongst other things, organized regional workshops on this matter (Becerra 1993; WRI / IUCN / UNEP 1994). With the strategy for the national park system, the government intends to evaluate the situation of the 44 existing protected areas in Colombia. At least five main issues will be considered: strengthening of planning; estimation of the economic benefits of protected areas; fostering regional and local support; increasing, and making more effective, state presence in the areas; and improving knowledge of the ecosystems being protected (pers. com. C. Castaño, January 1995).
Amacayacu National Nature Park: settlement of conflicts between local inhabitants and the park administration

J. Antonio Villa Lopera

Abstract: Amacayacu Park is located in southern Colombia, near the borderlines with Peru and Brazil. The inhabitants of the reserved area are mainly of the Ticuna ethnic group. This chapter outlines the resource use problems from the perspective of the local population to give an idea of how the conservation challenge is perceived in the area. It shows the interdependence and interaction between conservation efforts and the inhabitants' standard of living and presents examples of specific projects to generate income from productive rather than extractive activities. An attempt is made to demonstrate how conservation can be an option for the population if the activities inherent to it are developed in a climate of equity and horizontal communication. The accompanying "leaflet" illustrates the discussion that is under way to define management guidelines for Amacayacu that will enable it to advance toward the objectives of the Colombian National Park System.

Amacayacu National Park is located in the Special Amazon Commissariat (Comisaría Especial del Amazonas), in the region between the Putumayo and Amazon Rivers. The boundaries of this Park were drawn at the end of 1975, including an approximate area of 293,500 ha. The relief includes a mosaic of moderate to strongly dissected low hills and marshy or swampy zones. Mean annual rainfall is around 3000 mm, with an average temperature of around 27°C and a relative humidity of over 90%. The vegetation in the Amacayacu region greatly depends on the climate and in most parts consists of very moist ombrophilous lowland forest. In the southern part of the Park, edaphic conditions in the flood plains of the Amazon River produce a tropical riparian forest (UNESCO, 1981).

The inhabitants of Amacayacu Park

Most of the inhabitants of Amacayacu National Park belong to the Ticuna ethnic group of the Tukano linguistic macro family, and Nimuendajú (1952) has made an excellent report on this group. The Ticunas formerly lived on the banks of the small tributaries of the Amazon, Amacayacu and Cotuhé rivers, in communal dwellings built of round logs with two-slope roofs of braided palm leaves. Today nearly all the Ticunas in this area live in small groups of dwellings located on hills not subject to
flooding. They have left the banks of the small rivers and moved to the banks of the Amazon, the lower Amacayacu River, and the Cotuhé River. Their settlements are composed of individual family dwellings of varied design and construction, including wooden planks, coarse canvas, and zinc sheeting. Only in a few cases there are family dwellings at some distance from the settlements.

Today, the population of the villages within or near the Park is of varied racial composition, since the mixture with “white” people of Peruvian, Colombian, and Brazilian nationality has been and still is frequent. There is also some mixture with other ethnic groups such as Cocamas, Yaguas, and Huitotos. Each community has undergone a marked process of social and cultural change, which in the case of the Ticunas of the Brazilian Amazon has been the subject of detailed study by Cardoso de Oliveira (1972). The present situation of the Ticunas of San Martín del Amacayacu has been studied by Torres (1985), Fajardo (1985), and Mosquera (1986). Indigenous culture and social organization has always been under constant influence, from missionaries and traders in the past to officials, researchers, and tourists in more recent times. The processes of adaptation and change go on, and, to all appearances, are irreversible.

Amacayacu National Park includes the villages of Palmeras, with almost 100 inhabitants, and San Martín del Amacayacu, with 350 inhabitants. However, there are other villages, situated close to the Park’s boundaries, which have an influence on significant areas of the Park itself: Mocagua (220 inhabitants), Buenos Aires (70), Cañabrava (30), Macedonia (380), and El Vergel (75).

Land tenure and the use of natural resources

A national park in Colombia “establishes a special natural resource management regime, even though the area in question includes privately-owned lands, homesteads, and collectively-owned property” (Castañeda, 1990). The communities of Mocagua, Palmeras, San Martín del Amacayacu, Buenos Aires, and Cañabrava possess indigenous resguardos, comprising large areas of the territory delimited as Amacayacu National Park. These resguardos, in contrast to the indigenous reserves, represent perpetual community ownership of the land.

The lands surrounding the National Park include a forest reserve (reserva forestal) and a forest reserve exemption zone (sustracción a la reserva forestal). The former constitutes a form of State ownership of the land and permits regulated use of plant resources. The latter permits private ownership of the land and has different resource use regulations. Agricultural practices from other regions, such as livestock-grazing, have been introduced to these forest reserve exemption zones, which consist of narrow strips along the banks of some rivers.

The subsistence of the region’s inhabitants is based mainly on itinerant agriculture, hunting, fishing, and gathering. Glenbosky (1983), Prada (1986), and Campos (1985) have illustrated the present use of natural resources by the Ticunas
Colombia: main human settlements in the region of Amacayacu National Park

Settlements:
1. San Martín
2. Palmeras
3. Mocagua
4. Macedonia
5. El Vergel
6. Cañabrava
7. Buenos Aires
8. Puerto Nariño
9. Caballo-cocha
10. Cuchillo-cocha
11. Tarapacá

- international boundary
- park boundary
- villages
- ranger station
of Puerto Nariño and San Martín del Amacayacu. The inhabitants usually satisfy their needs for clothing, utensils, transport, recreation, education, etc. through timber, fruit, and fish trading, wage labor, small shops, sale of handicrafts, and domestic animal raising. However, illegal activities such as trading in wildlife species or unauthorized forest products, or participation in narcotic drug processing operations, often generate higher incomes than the other activities mentioned. Demand from outside the region has become the principal driving force for unsustainable extractive activities. Trade is carried out chiefly with the towns of Leticia, Puerto Nariño, and Tarapacá, in Colombia, but also with Caballo Cocha and Iquitos in Peru, and with Tabatinga, Benjamín Constant, and Manaos in Brazil.

The use of natural resources in lands belonging to any of the following four categories is permitted for subsistence requirements, but their use for commercial purposes is strictly regulated:

- In park areas, no commercial exploitation is permitted.
- In the resguardos, the community members may perform commercial exploitation subject to regulation by the government and by the community. In areas where resguardos and the Park overlap, very limited exploitation is permitted to satisfy the Indian’s subsistence needs.
- In forest reserve areas, any Colombian citizen may apply for a forestry exploitation permit.
- In the forest reserve exemption zone, although forestry exploitation is regulated, there is a greater amplitude in the use of non-fauna resources.

With the exception of some aquatic species, trade in wildlife products originating directly from the natural environment is prohibited throughout the country for all citizens and ethnic groups. Threatened or endangered wild flora and fauna species receive preferential treatment since the hunting of such species is totally prohibited in all cases, even if only for subsistence.

Thus, current resource use by the native population is both conflictive and dynamic. On the one hand, the natural resources must be preserved at all cost. On the other hand, these resources are used to satisfy the basic needs of the population. Problems occur because tropical forest inhabitants are in contact with “modern” society, characterized by large-scale production and consumption of goods and services. The forest dwellers, however, have not yet developed production or exchange systems appropriate for that foreign social and cultural environment and are thus placed in a disadvantaged position.

The local inhabitants bear a great burden as far as conservation is concerned, because the limitations on the use of the resources in their territories lower their standard of living. At the same time they are expected to take care of the resources so that these may be available to the country and the world for use in a different manner, however, they receive no compensation for their services. It is difficult for them to use the resources in a sustainable manner, since the value of rural labor and products fares unfavorably on the market when exchanged for articles manufactured outside the region. The native is thus compelled to extract more and more natural
resources from his surroundings, thereby potentially even threatening his own future welfare.

Conservationists, therefore, must aspire to change these conditions. Genuine, efficient conservation requires equity in the face of the opportunities and responsibilities involved. Indeed, the greater the pressure applied for conservation, the greater has become the pressure to use resources freely and unsustainably. The positions maintained on either of the two extremes have generated conflicts detrimental both to the environment and to the peoples’ standard of living. The creation of some type of culture and society in accordance with the local inhabitants’ own conditions, requirements, and expectations comes within the concept of ecodevelopment, defined by Golley (1983) as “the development of any site taking into account the greatest sustainable benefit of its physical, biological, and cultural resources.”

Management review: involvement of the local communities

Management of the Amacayacu National Park involves a set of activities called “linkage with the communities”. The aim of these activities is to:
- understand the population’s problems from their own perspective;
- inform the population regarding the environmental problems facing the country and the world, as well as government policies designed to deal with such problems;
- support, and collaborate in, community organizations, so that the people themselves become increasingly more involved in solving their own problems;
- spread the idea that peoples’ well-being depends to a great extent on the quality and quantity of the resources they are able to maintain or conserve,
- inform the public that it will be very difficult for people living in absolute poverty to protect the resources that they require for their own survival.

Since 1985, efforts have been made to unify objectives within the above framework, so that conservation will become a real alternative for the population and pressure on the Park and its resources will gradually be reduced. Periodic meetings have also been held with the communities in an attempt to involve them in the administration of the Park. These meetings have addressed two complementary issues: first, publication of the current regulations with explanation of the motives for them, and second, the search for economic, technological, or social options that could increase the population’s income without causing damage to the natural and social environment. Discussions have revolved around possible developments of agroforestry and ecotourism, management and reproduction of wildlife species that are endangered or subject to great hunting pressures, or fish-farming activities. The formation of cooperatives that could enhance the value of regional products has been another subject of discussion, along with the testing of organizational systems that would enable the communities to take the reins in solving their own problems. Examples of the proposals presently under consideration are set forth in work and
discussion papers. Within the preliminary guidelines for interaction of Amacayacu Park with the local communities, the following immediate objectives have been identified:

- the development of sources of income that are free from seasonal hazards and accessible to all members of the community;
- the creation of a close relationship between the area’s inhabitants and researchers to adopt technologies appropriate to the historical, socio-cultural, and natural conditions of the region and thus to permit the conservation and sustainable use of natural resources; and
- the raising of awareness as to the importance and validity of traditional knowledge so that community members themselves will devote time and resources to compiling, organizing, evaluating, and publishing such knowledge.

These immediate objectives are based on five primary goals:

- use of natural resources through techniques that prevent their depletion and degradation and avoid the extinction of species;
- linkages between the communities and the Park based on common welfare and conservation interests;
- self-sufficiency of the communities with respect to their basic needs;
- acquisition of skills and confidence by the communities in solving their own problems;
- satisfaction of the communities’ needs for conservation and sustainable use of natural resources.

One overall goal for the long-term planning and management in the Amacayacu National Park must be the striving for genuine participation and involvement of the population (Villa, 1989).

Some alternatives and their results

Actions in various areas have been undertaken over the past six years: the design, construction, and start-up of an ecotourism project; joint management of a portion of land with dual park-resguardo status; construction of a pond for fish-farming; and the creation of a handicrafts cooperative. These alternatives have gradually expanded, with encouraging results. Other proposals involving agroforestry projects and projects for the reproduction of endangered species are slowly progressing towards implementation.

In the operation of the “Yewae” Visitors’ Center for ecotourism activities, the inhabitants participate on a rotating basis to ensure the provision of all services, fair distribution of income, opportunities to take part in the administration and evaluation of activities, opportunities for open and frank dialogue with different sectors of the population, the collection of fees to be used in a community fund, and the administration of financial resources in a serious and reliable manner.
Limits to forest exploitation in a zone where the park and the resguardo overlap were agreed as follows:
- Only community members may apply for a permit in this zone;
- The permit is granted by the traditional community authority and is subject to technical endorsement by park personnel;
- The beneficiary must report the yield harvested to both authorities and deposit a fixed percentage of the profits in the community fund.

This system provides the opportunity not only to involve the community in the protection and administration of their resources, but also to quantify all exploitation, reduce specific local pressures on forest resources, make joint park-community acknowledgments, and greatly improve relations between the parties concerned.

The construction of the fish-farming pond led to the formation of an interested group and made the community aware of the need to overcome internal differences for their own benefit, handle larger financial resources, and coordinate work on a medium and long-term basis, as opposed to the traditional immediateness of most of their activities. Implementation was based on preparation by the community of a plan to orient goals, activities, and evaluation, which has shown the population that they possess valuable knowledge, although at times this knowledge may be incomplete. The most important tangible achievement and the specific objective of the fish-farming project was to provide the community with a reliable and constant source of protein.

The design and operation of a handicrafts cooperative seeks above all to stimulate the organizational and administrative ability of intra-community associative groups. The cooperative operates at the Visitors’ Center and consists of some 150 members from 11 community groups. A park officer assists with its organization and operation, which are gradually being handed over to representatives elected by the communities themselves. Issues now being addressed are the conservation of species and resources, management of money, report preparation, planning, and quality control. The importance of product and labor values can be clearly appreciated in this activity, which is comparatively well remunerated.

The common denominators of the above four options are their success in arousing an interest in conservation in a population that is beginning to see the Park’s usefulness; the possibility of inter-cultural respect instead of the abuses that were more frequent in the past; and the presence of prior dialogue in situations of imminent conflict, leading in many cases to bilateral cooperation and understanding. It is significant that one of the basic objectives is the gradual assumption by communities of the leadership in implementing solutions. This process could even change or replace the institutional or individual action that has been customary in the relations between government and population. The problems and imperfections are many, but little by little, nature conservation and human welfare are becoming mutually understandable and compatible.
WHAT ARE WE TRYING TO DO IN AMACAYACU NATIONAL NATURE PARK?

- We are trying to reconcile regional development with respect for, and conservation of, Nature.
- We are trying to keep some natural resources safe from the consumer, industrial, market society.
- We are trying to think of development in terms of the mind and the spirit of Man rather than in terms of civil works or technical achievements, which are not excluded, only subordinated.
- We are trying to begin and maintain constant, peaceful, and free conservation among those who inhabit and visit the region, whether visitors are administrators, researchers or tourists; with special attention to life, conservation, and equity - economic, political, social, and cultural equity.
- We are trying to make conservation the concern and commitment of all, instead of the interest of only a few, and the responsibility of fewer still.
- We are listening to, and trying to understand, the challenges that face the local inhabitants who belong to other cultures, races, and conditions.
- We are starting from the premise that we are all ignorant in some way and about some things, and also that, depending on our own personal and social history, we are all experts in different ways and on different subjects. We, therefore, wish that all opinions be valued, so that they may complement one another.
- We are trying to unite academic skills and research methods with local knowledge and experience on a two-directional basis: from local to national and international and vice-versa, to respond to a local question, interest or expectation at the same time as one from the outside, since we consider a national nature park to be a common area. And, at the same time, we are seeking compensation for all those who contribute to conservation and knowledge.
- Lastly, we are trying to achieve self-sufficiency and the possibility of self-determination for the Amazon peoples, so that they may have not only the natural resources of their territories, but also their proper place in the world of Men.
References


Ecuador

The system of protected natural areas
Sergio Figueroa

The Galapagos Islands: scientists, tourism and settlement pressures
Alfredo Carrasco V.

Machalilla National Park: community involvement and sustainable use
Carlos Zambrano Bravo
Abstract: In 1981, the Ecuadorian government issued a decree creating the System of Protected Natural Areas, which presently consists of 15 national parks, ecological reserves, and other protected areas, covering a total area of 1,254,763 hectares — approximately 11% of the country’s territory. The planning and management of these areas is the responsibility of the Natural Areas and Wildlife Division within the Ministry of Agriculture and Livestock. Serious problems confront the conservation of these areas, due to the traditional, and more recent, inhabitants who live in and around them. There are social problems that are potential "time bombs" since they seriously endanger the existence of the country’s natural areas. The technical, political, and economic support that the government, as well as Ecuadorian and foreign non-governmental organizations, can provide for the management of natural areas and wildlife is a positive step toward the conservation and rational management of Ecuador’s most outstanding ecosystems, many of which are unique in the world. This chapter summarizes the successes and shortcomings of the Ecuadorian System of Protected Natural Areas, and proposes solutions that are now being applied or should be applied in the near future.

Due to its tropical location and the presence of the Andes, Ecuador’s area of 281,341 km² contains the climates of all the latitudes of the world. In accordance with the Holdridge system there are 26 life zones in Ecuador, and it is therefore one of the most biologically diverse countries in the world.

Factors such as the accelerated exploitation of natural resources in the last 20 years, unplanned settlement, environmental pollution, and development without regard for ecological issues, have all degraded the environment, threatening wildlife and the quality of human life as well. To guarantee the conservation and sustainable use of natural ecosystems and biodiversity, the Ecuadorian government issued Executive Decree No. 74 on August 24, 1981, creating the System of Protected Natural Areas (Patrimonio Nacional de Areas Naturales), consisting of 15 areas, and more areas will probably be added in the near future (Map 1).

The planning, development, management, and protection of the System is the responsibility of the Natural Areas and Wildlife Division (División de Areas Naturales y Vida Silvestre) of the Subsecretariat of Forestry and Renewable Natural Resources (Subsecretaría Forestal y de Recursos Naturales) of the Ministry of Agriculture and Livestock (Ministerio de Agricultura y Ganadería). Natural areas in the System are presently classified into the following administrative categories
Art. 70 of the current Law on Forestry and Conservation of Natural Areas and Wildlife, *Ley Forestal y de Conservación de Áreas Naturales y Vida Silvestre*):
- national parks (*parques nacionales*);
- ecological reserves (*reservas ecológicas*);
- wildlife refuges (*refugios de vida silvestre*);
- biological reserves (*reservas biológicas*);
- national recreation areas (*áreas nacionales de recreación*);
- fauna production reserves (*reservas de producción de fauna*);
- hunting and fishing areas (*áreas de caza y pesca*).

Not all of these categories are currently represented within the System (Table 1). Moreover, the management categories identified in the law are inadequate and insufficient and new categories are being proposed. Twenty-one of the 26 Holdridge life zones found in the country are protected and managed within the System. The life zones currently not represented are:
- tropical desert,
- low montane thorny steppe,
- tropical dry forest,
- low montane rain forest, and
- super-humid alpine tundra. The continental aquatic ecosystems are well represented in the System, but not the mangrove ecosystem or other coastal ecosystems, such as coral reefs, and nearshore and pelagic environments (Cifuentes *et al.*, 1989).

### The strategy for the national system of protected areas

The Strategy for the Ecuadorian System of Protected Areas, Phase II (*Estrategia para el Sistema de Áreas Protegidas del Ecuador, II Fase*, Cifuentes *et al.*, 1989), is the official document that guides actions guaranteeing the conservation and management of the country’s natural areas, with at least a sample of its outstanding life zones and ecosystems. The system of protected areas proposed in Phase II consists of a minimal system of 24 natural areas and an optimal system of 32 areas (Table 2). However, research being carried out by interdisciplinary teams, such as the Rapid Assessment Program of Conservation International, may result in the inclusion of one or more additional areas within the optimal system.

### Conservation objectives

The objectives for creation of protected areas in Ecuador are:
- preservation of samples of ecosystems in their natural state;
- preservation of genetic resources and ecological diversity;
- protection of endangered wildlife species, outstanding wild flora and fauna, and aquatic resources;
- protection of unique landscapes and geological formations;
- preservation of watersheds through control of erosion and sedimentation, thereby protecting resources downstream;
- protection of historical, archeological, and paleontological sites;
- promotion of the survival of indigenous populations and cultures by guaranteeing their territorial rights within protected areas;
- promotion of rational use of forest products, wildlife, and coastal and marine resources;
- provision of opportunities for environmental education and research;
- provision of opportunities for recreation and tourism; and
- maintenance of alternatives and management flexibility, including multiple use where applicable.

Management plans

Ten of the 15 protected areas have management plans, and preparation of the remaining five plans is already projected. However, the existing management plans were written by only one or two technicians and therefore have a narrow, disciplinary focus. Only one management plan has been evaluated and none has been updated, so the improvement of these plans is an urgent matter. Moreover, management plans have not been approved at the appropriate political and decision-making level to allow for their effective application.

The budget

The System finances itself to a great extent through income from tourist entrance fees, the majority of which come from Galapagos National Park. The government only finances part of the salaries of the technical, administrative, and service personnel. Funds are inadequate and represent only the minimum amount required for administration and management of the System. However, there is a strategy for obtaining additional funds through debt-for-nature swaps, national and international NGOs, private enterprises, and specific projects, in addition to the development of tourist facilities in the natural areas, and the re-evaluation of the entrance fees. The annual budgets of the Division of Natural Areas and Wildlife for 1989 and 1990 (including salaries), were US$ 979,000 and US$ 946,300, respectively. This represents an average of US$ 63,000 for each of the 15 areas in the latter year.

Personnel

The number of technical, administrative and service personnel working in the System is insufficient. The entire Division has only 275 employees, 17 of whom work in the central office in Quito, 241 in the field, and 17 in the control of wildlife trade and management outside of protected areas. There are 15 area superintendents, 20 conservation officers, and 198 park guards (Table 3). The technical personnel in Quito, as well as those in charge of some areas, are university graduates with some
The Ecuadorian system of protected natural areas 223

Table 1

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Protected Areas</th>
<th>Year created</th>
<th>Final boundaries</th>
<th>Area in ha</th>
<th>Location (Province)</th>
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<td>4</td>
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<td>13</td>
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</table>

years of experience. The conservation officers have similar backgrounds. Most of the park guards and wildlife wardens, however, have no secondary education, and an attempt is being made to remedy this problem through training carried out with the assistance of the Ecuadorian NGO Fundación Natura.

The role of the System

The most important task of the System is undoubtedly to guarantee the physical integrity and proper administration of the protected natural areas. To this end, the Subsecretariat of Forestry and Renewable Natural Resources is carrying out activities that include the conservation, and rational use of renewable natural resources
### Ecuador: proposed protected areas

<table>
<thead>
<tr>
<th>Protected Areas</th>
<th>Reclassification of area proposed</th>
<th>Proposed new area</th>
<th>To be included in minimum system*</th>
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<tr>
<td>Laguna de Cube</td>
<td></td>
<td></td>
<td></td>
<td>Esmeraldas</td>
</tr>
<tr>
<td>Mindo</td>
<td>x</td>
<td></td>
<td>*</td>
<td>Mindo</td>
</tr>
<tr>
<td>Lagartococha (*)</td>
<td></td>
<td></td>
<td>*</td>
<td>Napo, Sucumbios</td>
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<tr>
<td>Awa</td>
<td>x</td>
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<td>*</td>
<td>Esmeraldas, Carchi</td>
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<tr>
<td>Coyabeno (*) (see No. 12 in table 1)</td>
<td>x</td>
<td></td>
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<td>Sucumbios, Napo</td>
</tr>
<tr>
<td>Cutucú</td>
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<td>Morona Santiago</td>
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<td>Padmi</td>
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<td>Zamora-Chinchipe</td>
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<tr>
<td>Tiguino</td>
<td></td>
<td></td>
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<td>Pastaza</td>
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</table>

* Areas proposed for additional inclusion in a minimum system according to the Strategy for the National Protected Areas System of Ecuador, Phase II (Estrategia para el Sistema Nacional de Areas Protegidas del Ecuador, II Fase).

(*) Area declared in the last years, but not necessarily in the category proposed: see editorial update.
The Ecuadorian system of protected natural areas

Table 3
Ecuador: personnel in protected areas

<table>
<thead>
<tr>
<th>Conservation Units</th>
<th>Total personnel per unit</th>
<th>Professional</th>
<th>Technical</th>
<th>Park Guards</th>
<th>Administrative</th>
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<tr>
<td>NATIONAL PARKS</td>
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<tr>
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<td>10</td>
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<td>Sangay</td>
<td>28</td>
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<td>NATIONAL RECREATION AREAS</td>
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<td>16</td>
<td>16</td>
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</tr>
</tbody>
</table>

Total personnel at national level: 225 240 15 34 30 38 198 152 8 16

under the concept of "ecodevelopment", taking into account the following guidelines:
- assist in overcoming the national economy's current dependence on petroleum (52% of the total budget) by promoting new economic activities and the use of non-traditional products compatible with conservation;
- promote economic growth of the communities that live in or near the protected areas, in order to help them overcome extreme poverty;
- ensure wildlife conservation and sustainable development for the local peoples' benefit:
- sponsor and strengthen the coordination of governmental and non-governmental institutions in their efforts aimed at the conservation and management of the country's natural areas and wildlife;
- foster participation by the private sector; businessmen, communities, and the general public, in activities relating to ecodevelopment and the sustainable use of resources, in coordination with the Subsecretariat of Forestry and Renewable Natural Resources;
- sign and enforce national and international agreements relating to the conservation and management of wildlife and protected areas;
- evaluate and apply the Strategy for the System of Ecuadorian Protected Areas;
- develop a strategy for conservation and management of Ecuadorian wildlife outside the protected areas;
- strengthen the technical and administrative capacity of the Natural Areas and Wildlife Division (The increase in administrative status through creation of a Natural Areas and Wildlife Institute is a medium-term goal);
- strengthen the institution's image through participation with, and support from, NGOs and the press;
- promote and support basic and applied research, undertaken by Ecuadorian and foreign scientists, on issues relating to the conservation and management of protected areas and the natural resources found there, as well as on social, cultural, and historical aspects of these areas;
- support environmental education and interpretation in the protected areas themselves, as well as through the creation of a specialized department in the Quito office;
- develop interpretation centers with basic facilities in the System's protected areas, which will serve to strengthen the public relations, environmental education, and interpretation programs;
- offer opportunities for private enterprises to set up nature-oriented tourism projects in the System's protected areas, in accordance with the standards established in the current laws and management plans (The government will soon issue a set of regulations applying to the establishment and operation of tourism and related activities in natural areas);
- review and update the current Law on Forestry and Conservation of Natural Areas and Wildlife and the general regulations for its application.

Current problems in the administration of the System

A number of problems currently affect the conservation and management of the protected areas. In order of importance, these problems are:
- lack of adequate governmental, political, and economic support;
- lack of inter-agency coordination and clarity regarding legal definitions and jurisdictions, leading to: the existence in some areas of mining or petroleum...
operations in conflict with conservation objectives; uncontrolled settlement (involving deforestation, illegal use of flora and fauna, livestock-grazing, and inappropriate soil use); and construction of roads that threaten the integrity of natural areas;
- minimal participation of local populations in the identification, planning, and development of conservation sites;
- lack of environmental education programs for the people that live in and around protected areas;
- lack of implementation, evaluation, and revision of management plans; and
- lack of training of personnel to handle the mentioned problems with a new approach, promoting sustainable development around the protected areas.

The greatest threat to the integrity, conservation, and management of the System, however, is the execution of development projects, without consideration of environmental factors that directly or indirectly affect the protected areas. At times, the indirect effects are more serious than the direct ones: for example, mining and petroleum operations often include the construction of roads, which in turn encourage invasion of squatters, deforestation, and indiscriminate use of the protected area's natural resources.

**National park problems**

During the 1970s and the 1980s, national parks were conceived of in Ecuador as vast areas (10,000 ha minimum) with one or more complete ecosystems, free from human occupancy, whose basic objectives are the conservation of ecosystems and wildlife. Activities such as mining, oil exploitation, or use of flora and fauna are incompatible with the regulations established for this administrative category, and the only activities permitted should be scientific research, environmental education, natural resource interpretation, and on a limited scale, nature-oriented tourism. In reality however, all the Ecuadorean national parks suffer from problems related to human activities. The following main problems have been identified:

**Galápagos National Park**
- Growing pressure of human activities on natural resources.
- Unplanned transformation of population centers into tourist support centers.
- Excessive commercialization and development of tourist activities.
- Provincial administrative systems that are out of touch with social reality, as well as with regional conservation and development objectives.
- Progressive deterioration of the Park's institutional structure.
- In addition to all the above aspects, referred to in the General Tourist Management and Ecological Conservation Plan for Galápagos (Comisión Multisectorial, 1991), there are also the pressures exercised by opposing political and economic interests.
Sangay National Park
- Unclear land tenure.
- Introduction of exotic animals and overgrazing.
- Garbage at sites frequented by visitors.
- Illegal hunting.
- Unauthorized settlement.
- Road construction.
- Fires set by people.

Cotopaxi National Park
- Unclear land tenure.
- Logging for firewood and for sale as timber.
- Illegal hunting and fishing.
- Vandalism at sites frequented by visitors.
- Soil erosion due to cutting down of natural vegetation.
- Conflicts in the management of park flora.
- Overgrazing and fires set by people.

Machalilla National Park
- Unclear land tenure.
- Logging for firewood and for sale as timber.
- Introduction of exotic animals and overgrazing.
- Garbage at sites frequented by visitors.
- Conflicts between park guards and the community.
- Road construction.
- Illegal hunting.

Podocarpus National Park
- Unclear land tenure.
- Logging for firewood and for sale as timber.
- Introduction of exotic animals and overgrazing.
- Illegal hunting and fishing.
- Fires set by people.
- Graffiti, vandalism and accumulation of garbage at sites frequented by visitors.
- Mining, causing soil and water pollution by chemical substances.
- Air pollution (smoke).
- Conflicts in the management of park flora.
- Conflicts between park guards and the community.

Yasuni National Park
- Unclear land tenure.
- Logging for firewood and for sale as timber.
- Conflicts in the management of park flora.
- Oil exploration.
- Possible oil extraction in the near future.
Ecuador. Photos 27/28: In Machalilla National Park, archaeological discoveries have played an important role in the integration and mutual understanding of the local population and the Park's administration. Some of the artifacts of the Valdivian and the Manteña cultures (3,900 B.C.-750 A.D.) are on display in a small community museum in Agua Blanca.
Ecuador. Photos 29/30/31: The unique Galapagos Islands, declared a World Heritage Site by the UNESCO in 1979, are visited by more than 50,000 tourists per year. Although most animals are amazingly tame (here: Blue-footed booby, Sula nebouxi; Marine iguana, Amblyrhynchus cristatus; and a male Sea lion, Zalophus californianus, with his harem), some have started to show signs of stress due to increased visitor pressure.

Ecuador. Photo 32: Confiscated hides show that in Amazonian Ecuador the trafficking of endangered species is a serious problem. Photo 33: In the Cuyabeno Fauna Production Reserve, demands for land titles by traditional inhabitants and non-traditional settlers led to demonstrations and political controversy. In 1993, the settled part of the Reserve was released from its strict protected area status and declared a "forest heritage", which permits communal land titles but assures management as a buffer zone for the rest of the Reserve. Cooperative agreements are being formulated with the indigenous communities that together claim ownership of nearly the entire Reserve.
Ecuador. Photo 34: Petroleum operations cause great impacts on the fauna, flora, and watersheds of the protected areas of Cuyabeno, Limoncocha, and Yasuni. The use of innovative technology and the enforcement of certain standards would greatly contribute to reducing environmental impacts. Photo 35: Nature tourism that respects and conserves physical and cultural characteristics ("ecotourism") can be a viable option for the economic use of certain protected areas.
It should be noted that generally the process of park establishment and management was conducted without consultation of the local residents. However, it would have been desirable to involve them in the various phases of area identification, designation, management, and the evaluation of objectives, activities, and goals of each protected area. Nonetheless, there have been some community development projects carried out that were compatible with the objectives of conservation and sustainable use of renewable natural resources.

Some national parks have been preserved, for the time being, from serious risks to their physical integrity, thanks to international technical and financial support (Galápagos), or because of their distant location and difficult access (Yasuni), but if appropriate and timely action is not taken, these national parks may soon be severely threatened.

Legal status of inhabitants in national parks

Indigenous communities

Article 38 of the Law on Forestry and Conservation of Natural Areas and Wildlife provides that “indigenous communities shall have the exclusive right to use forest products, other than timber and wildlife, in the lands that belong to them, in accordance with the regulations”. It should also be emphasized that it has been, and continues to be, a policy of the Ministry of Agriculture and Livestock to guarantee the long-term existence of the indigenous communities and inhabitants that have traditionally lived in the national parks and other protected areas, such as the Huaoranis and Quichuas in Yasuni National Park; the Cofanes and Quichuas in the Cayambe-Coca Ecological Reserve; the Sionas, Secoyas, Quichuas, and Cofanes in the Cuyabeno Wildlife Production Reserve; and the Chachis in the Cotacachi-Cayapas Ecological Reserve. One of the major issues to be addressed when reviewing protected area management plans is the establishment of cultural zones for the benefit of the indigenous communities that live in or near these protected areas.

Privately-owned land

Another set of problems involves inhabitants who are not members of indigenous groups but have settled legally inside protected areas. Article 73 of the current Law on Forestry and Conservation of Natural Areas and Wildlife applies in such cases: “privately-owned land and natural resources within the boundaries of protected areas shall be expropriated or shall revert to state ownership under the respective laws.” Legal and financial studies are presently being carried out for the application of Article 73. Up to now, efforts have been made to maintain good
relations with the owners and regulate the use of the land and its resources so as to avoid further alteration of semi-natural environments and protected area objectives. In certain critical areas, however, it would appear necessary to apply the law and proceed with expropriation, with the possibility that state-owned lands be provided as compensation.

Squatters

In case of squatters, the actions to be taken will depend on the magnitude of the problem. If the “invasion” is recent and involves only a few people, eviction and resettlement may be carried out. In fact, a policy of constantly informing local residents of the existence and location of the protected areas, including an effective program of demarcation, adequate signs and patrolling of park boundaries, should be adopted by the national park administration to avoid illegal settlement of protected areas. The situation becomes more complicated when recent settlement involves large numbers of people, making it necessary to design and execute a strategy for reconciling the national park’s objectives with the interests of these inhabitants. Illegal settlement occurs due to inadequate patrolling, lack of information, and lack of coordination between institutions. Road construction through or near protected areas leads to the arrival of settlers, who presently cause the most problems and the greatest destruction of the environment. Lack of timely attention to this problem has led to cases like that of Cuyabeno Fauna Production Reserve, where approximately 60,000 ha are held by 1,000 squatter families. In order to settle this problem, the Ministry of Agriculture and Livestock designed the following strategy for the Cuyabeno Reserve:

- Active participation of all parties involved in the identification and solution of problems.
- Formulation of new regulations that will satisfy the requirements of the illegal settlers and the objectives of the Reserve.
- Preparation, application, and evaluation of an overall management plan for the Reserve (This plan is being prepared).
- Identification and execution of pilot projects for sustainable use of resources with the indigenous communities and settlers whose presence has been legal.
- Obtaining of technical and financial support for this strategy from Ecuadorian and international NGOs and private companies (Some support has already been committed).

There is a potential threat of illegal settlement in Yasuni National Park due to petroleum explorations nearby. The strategy for this protected area is as follows:

- Coordination and dialogue with the oil companies so as to avoid, or at least minimize, direct or indirect environmental impacts.
- Preparation, application, and evaluation of an overall management plan for Yasuni National Park.
Technical and financial support to upgrade programs for control, environmental education, and service to the community through sustainable use of the natural resources (specific offers have already been made).
- Support for scientific research and monitoring of the area through the creation and operation of an international scientific station.
- Extension of the Park’s boundaries to include adjacent pristine areas which are of great interest for conservation but (so far) of no interest to the oil companies.

Miners

As one of its natural resource development policies, the government in the past has encouraged mining activities in several areas of the country, including Podocarpus National Park, which possesses gold and limestone deposits. Relatively high short-term profits are possible from the exploitation of these resources, but the probable environmental impacts are serious and incompatible with the objectives of a national park. There are already individual miners in the area who are causing direct negative impacts on Podocarpus National Park, and for this reason the Ministry of Agriculture and Livestock has not authorized mining within this protected area. Since it is impossible to eliminate mining altogether, and due to the high social and political costs involved, a strategy should be devised to deal with and minimize these problems, including the following actions:
- Identify and quantify the problem;
- Take a socio-economic census of the affected zones;
- Try to get the individual miners legally organized into companies;
- Provide technical advice enabling them to carry out efficiently the various stages of exploration, exploitation, and marketing;
- Require companies to perform environmental impact studies; prepare impact mitigation, environmental restoration, and contingency plans and carry out the respective activities;
- Perform continuous follow-up evaluations to ensure fulfillment of agreements;
- Coordinate closely with the Ministry of Energy and Mines to avoid contradictions regarding legal definitions and jurisdictions;
- Extend the National Park’s boundaries to other adjacent natural areas which are of great interest for conservation, but not for mining.

The outlook for Ecuadorian national parks

Notwithstanding the above problems, the Ecuadorian natural areas system has had some important successes at both national and international level:
- Ecuador’s protected natural areas system has been consolidated based on the national strategy for natural area conservation.
The strategy for expansion of the natural area conservation and management system has been reviewed.

- Fifteen protected areas (totaling 3,200,000 ha) have been set up to preserve and manage the most outstanding natural ecosystems.
- The conservation units have each been equipped with the basic infrastructure and minimum personnel necessary for their control and administration.
- Of the protected areas’ boundaries, 800 km have been delimited on the ground in various conflictive zones.
- The conservation and management of natural areas and wildlife is supported by the current Law on Forestry and Conservation of Natural Areas and Wildlife, which, although far from ideal, regulates extractive and other activities.
- The Subsecretariat for Forestry and Renewable Natural Resources is open to all actions that involve joining forces for the conservation and management of natural areas and wildlife, and agreements have thus been signed with governmental and non-governmental organizations.

Despite the limited number of personnel in charge of administration and management of the country’s natural areas and wildlife, there is a great esprit de corps and a keen desire to improve the situation of the national parks. Conservation and management of natural areas and wildlife is an activity that knows no frontiers, especially if one considers that many of the wildlife species recorded in Ecuador are unique in the world and there is national and international concern and support for their conservation.

The 1990s are considered to be a key decade for the conservation and ideal management of the System of Protected Areas. On the one hand, there is interest in carrying out development without respect for the environment and thus directly or indirectly affecting the national parks, but on the other hand, in Ecuador today there is a growing awareness of the importance of conservation of natural areas and the sustainable use of renewable natural resources. There is a great desire to link national parks to the harmonious development of the country.

Ecuador already has a strategy for its System of Protected Areas, and work is in progress to review the Law on Forestry and Conservation of Natural Areas and Wildlife, as well as to propose a new Environment Law (Ley de Medio Ambiente). New forms of financing and easier access to technical advice and financial resources are being studied and applied. Priorities have been established for the administration and development of natural areas, and constant efforts are being made to obtain sufficient political and financial support to achieve autonomy as well as economic and administrative self-sufficiency for the Ecuadorian natural areas and wildlife system. Most important, however, are community development projects, since they are instrumental in improving the quality of life of the people who live in and around the protected areas.
The 1990s — the decade of ecodevelopment — compel us to move on from conservation for its own sake to conservation linked to sustainable development. This is the only way to guarantee the continued existence of natural areas and wildlife, as well as a higher quality of life for the Ecuadorian people.

Editorial update: In late 1992, the Ecuadorian Institute for Forest, Natural Areas, and Wildlife (Instituto Ecuatoriano Forestal y de Areas Naturales y Vida Silvestre, INEFAN) was founded as an independent agency attached to the Ministry of Agriculture and Livestock, and substituting the Subsecretariat of Forestry and Renewable Natural Resources. Protected areas are now managed by the Administration of Natural Areas and Wildlife (Dirección de Areas Naturales y Vida Silvestre), which has the same ranking as the forestry administration.

The protected areas system was enlarged by the creation of two ecological reserves: El Angel in the province of Carchi (15,715 ha) and Antisana in the province of Napo (120,000 ha). In 1994, the Sumaco-Galeras National Park in the Napo province was declared in the eastern range of the Andes, protecting the area of the Sumaco Volcano. Although this newly protected area itself has no inhabitants, it is planned to incorporate the neighboring indigenous communities in the management of the area from the beginning.

In the Cuyabeno Fauna Production Reserve, the conflict with the settlers was solved by changing the management category in the zone occupied by settlers. This zone now has the legal status of a “forest heritage” (patrimonio forestal), which permits settlement and the allocation of communal land titles, but resource use is regulated by INEFAN. Since both categories (fauna production reserve and “forest heritage”) are managed by INEFAN, an integrated management is sought. The indigenous groups who live in the rest of the Cuyabeno Reserve (Sionas, Secoyas, Quichuas, and Cofanes) are about to sign agreements with INEFAN for co-administration of the Reserve and taking a more active role in stopping colonization, since this process affects their traditional territories as well. The next step to be taken is the creation of an advisory board for the Reserve’s administration, with representatives of indigenous groups, settlers, tour operators, petroleum industry, and NGOs, and where their different concerns will be discussed and hopefully integrated into the management of the Reserve (pers. com. Dr. Vladimir Valarezo, Dirección de Areas Naturales, INEFAN, March 1995).

In Ecuador at present, several legal initiatives are under way, including a National Environment Code (Código Nacional de Medio Ambiente, first presentation expected for December 1995), a Biodiversity Law (Ley de Biodiversidad, the proposal is being drafted), and a Law on Environmental Management (Ley de Gestión Ambiental, expecting its approval in August 1995). An Executive Decree (No. 1,802, dated June 1, 1994) established 17 basic environmental policies for Ecuador.

In September 1993, an Executive Decree was issued to create the Presidential Environmental Advisory Commission (Comisión Asesora Ambiental, CAAM), presided over by a delegate of the President, comprising representatives of the public and private sectors as well as environmental NGOs. The CAAM Secretary is the Director of the Environmental Unit of
the National Development Council, which was also created by the above decree. The main duties of CAAM are: to coordinate the environmental actions of public, private, and civil society agencies; to rule on environmental conflicts, and to coordinate the allocation of domestic and external resources for environmental matters. Additionally, CAAM is coordinating the development of the Ecuadorian Environmental Plan (Plan Ambiental Ecuatoriano, PAE), with full participation of the NGOs, a process which will culminate in the Second Ecuadorian Environmental Congress. CAAM is not intended to supplant any other agency, but attempts to strengthen other governmental bodies, within a coherent environmental framework, so they can all implement their roles and responsibilities (CAAM, ~1994; pers. com. Dr. Roberto Troya, Advisory Board CAAM, April 1995).

At present, CAAM's National Biodiversity Task Force (Grupo de Trabajo Nacional sobre Biodiversidad, GTNBD) is preparing the proposals for the Biodiversity Law and for a National Strategy for the Use and Conservation of Biodiversity in Ecuador (CAAM / GTNBD, 1995). Additionally, this group coordinates actions with the other Andean countries to sign an agreement (based on the Biodiversity Convention of Rio de Janeiro, 1992, and the Cartagena Agreement, 1969) on the Conservation and Protection of Genetic Material, which, to a great extent, is housed within the protected areas of the region (pers. com. Ing. Jaime Estrella, Member of the Coordinating Committee GTNBD, April 1995).
The Galapagos Islands: scientists, tourism and settlement pressures

Alfredo Carrasco V.

Abstract: Since the Galapagos Archipelago was discovered in 1535, the Islands have been visited by various human groups that used them as a temporary refuge or settled there. Man and his activities affected some of the fragile endemic species and altered several important ecosystems due to the introduction of species and the exploitation of resources. Due to their special natural features, the Islands have become a growing attraction for visitors (42,000 tourists in 1990). The mean migration average for the last ten years is 12% per year and the population doubled in the same period, such that now 10,000 people live permanently in Galapagos. Man's presence in general has brought a series of problems that are affecting the integrity of the Islands' ecosystems, but the growing tourism industry has become an important source of income. In view of the importance of preserving the Islands' natural values while respecting economic and social realities, management of Galapagos has to be structured within environmental conservation concepts.

The Galapagos Archipelago, is a group of islands of volcanic origin that emerged from the sea around four million years ago. They are situated in the Pacific Ocean, right on the Equator, some 1,000 km west of the South American coast. Their isolation from the mainland, their recent geological history and hostile environment all contributed to limit natural colonization to a few founder organisms, which developed unique characteristics that enabled them to live in that environment. Thus, these Islands are one of the most exceptional places in the world for scientific and educational activities, not only because of their unique biodiversity but also due to their spectacular landscapes.

The first initiative for the conservation of the Islands' ecosystems took place in 1934 when the Ecuadorian government issued Executive Decree 607 R.O. Nº 257, which prohibited taking possession of land without prior authorization. It also limited the collection of specimens of island fauna for scientific purposes, prohibited the capture of animals for commercial purposes, and mentioned the possibility of designating some of the islands as refuges and national parks (asilos reservados y parques nacionales). Subsequently, in 1936, 14 islands of the archipelago were declared wildlife reserves (reservas para la flora y fauna; Nº 31 R.O. Nº 189).

These conservation actions were carried out under the idea that the island fauna was in danger of disappearing due to the behavior of tourists, and that it was therefore urgent to take measures for protection and to foster the development of science. In 1937, Misael Acosta Solis, a member of the Ecuadorian National
In the last 30 years, most attention has been devoted to terrestrial environments. Evaluations made on the condition of the animal and plant populations prompted the concern of scientists and administrators working in the park, mainly because there was clear evidence of the impacts caused by different species of introduced animals, soil misuse, and natural resource exploitation. Plans were drawn up to protect the most threatened populations, and programs were initiated to eradicate goats from the smaller islands and to control them on the larger ones, with favorable results on islands such as Española, Santa Fe, Plazas, Baltra and Pinta; however, the goat problem continues on Isabela and Santiago.

Despite the efforts to preserve the integrity of the island ecosystems, one race of turtles has almost gone extinct and at least three species of sea birds are endangered. Twelve plant species are extinct and 180 are believed to be threatened. Of the 6 original endemic rat species, only 3 survive, and 18 species of native snails are endangered due to the destruction of microclimates caused by agricultural and urban activities. Decreases in the turtle and iguana populations made it necessary to set up a breeding center at Puerto Ayora, which has been successful. Over 1400 little Galapagos Turtles have been repatriated to their islands of origin, and on Española Island, newly-hatched Galapagos Turtles have been identified whose parents were repatriated 20 years ago. In the same way, iguanas are being reintroduced to Baltra
Island, where they had disappeared in the 1940s. Sea birds have also received special attention. The dark-rumped petrel (Pterodroma phaeopygia), in particular, is considered endangered due to impacts of rats and other animals in their main nesting zone on Floreana Island. These birds nest in cavities in the ground, and their eggs and chicks are therefore at the mercy of any predator, but survival rates have increased considerably in recent years. Studies of "vocalization" of petrels have been started on Santa Cruz Island to encourage nesting at protected sites. The flightless cormorant and penguins are threatened by the use of nets for fishing.

Introduced bird species, such as chickens and pigeons, transmit diseases that can cause serious and irreparable damage to native birds. Introduced Smooth-billed Anis (Crotophaga ani) compete with native birds, such as cucubes and finches. Anis are established on at least five islands and it is considered extremely difficult to eradicate them.

The Galapagos Archipelago is a particularly interesting area for the study of invertebrates. Due to its simple ecosystems and different climatic regimes, a great diversity of species and populations can be found in relatively short distances. The exact number of invertebrate species that inhabit the Islands is unknown, but they are estimated at around 2,000. The few studies performed have revealed that 66% of the beetles and 46% of the spiders are endemic species. There is an endemic bee (Xilocaipa Darwini) and one or two species of scorpions. The invertebrate species
are threatened by the gradual introduction of organisms. The introduced red ant (Wasmania auropunctata) is displacing the native ant and an estimated 18 other invertebrate species are endangered by the presence of this ant. During the last two years, the presence of a very aggressive wasp (Polistes versicolor) has been detected. It was reported for the first time on Floreana and is now present on most of the islands. This wasp may soon displace the carpenter bee and the Galapagos wasp (Odynera galapagoensis). Tourist and fishing boats act as carriers between the islands, and there is no management plan to control it.

The Galapagos Islands contain a total of 925 known plant species, 24% of which are endemic, 39% native and 37% introduced. Twelve species are extinct due to the pressure of human activities, such as burning and farming, and to the effects resulting from the introduction of herbivorous animals. Plant species introduced in national park areas, particularly those adjacent to the agricultural zones, often displace native plant species. The areas of Miconia robinsoniana on Santa Cruz require special protection due to the aggressive advance of cinchona (Cinchona succirubra) and guava (Psidium guajava). Similar problems affect the forests of Scalesia pedunculata. The presence of tupirrosa (Lantana Camara) on islands such as Floreana and Santa Cruz, and mulberry on San Cristóbal, is a serious problem.

Agricultural and livestock activities in the areas adjoining the Park create imbalances which affect both the park and the inhabitants. Present management of agricultural areas and watersheds leaves much to be desired. In order to regulate activities in these critical areas, a management plan is being drawn up for micro-watershed protection on San Cristóbal Island. Research is being carried out in forest nurseries with native (or, at least, non-aggressive introduced) species as an alternative for reforesting water-capturing areas and solving timber scarcity problems, and thus minimizing the use of the “matazarno” (Piscidia carthagenensis), an endangered native timber-yielding species.

Due to the development of the region, construction material requirements have increased considerably in the last ten years. Sand is taken from the beaches near populated areas, some of which had been nesting sites for the green sea turtle (Chelonia mydas) before this species disappeared from those beaches. Important geomorphological features are being drastically altered due to the demand for materials for road or airport foundations. In addition, the Park's integrity is being threatened by the growth of the human population, which is pressing for space for dwellings and agriculture. The zones of Scalesia on Santa Cruz, El Junco and La Poza Colorada on San Cristóbal, or Alemania on Isabela, are especially attractive areas for new settlements.

Conflicts and conservation in marine environments

The marine environments are characterized by their isolation from the mainland; their privileged position with unique land-sea features; climatic, marine and oceano-
The Galapagos Islands: scientists, tourism and settlement pressures

The Galapagos Islands have unique geographic conditions with seasonal fluctuations; and abundant shallow-depth invertebrate fauna. Hence the ecosystems possess high rates of species diversity, of endemism (about 30% of the species are endemic), and of habitat diversity (Arcos et al., 1988). The waters of the Galapagos Archipelago are visited by baleen whales, sperm whales, sea turtles and dolphins, for which this region constitutes their main breeding area. The Ecuadorian State protects whales, dolphins, and sea turtles in all its territorial waters. The underwater topography consists of steep slopes that permit passage from shallow to deep water in relatively short distances. Marine currents play an important part in marine life, having significantly influenced the evolutionary processes of the area, as well as contributing to climate regulation (Hauvenaghel, 1977).

Several attempts have been made to establish management policies for marine resources. In 1966, Grimwood and Snow recommended protection of the marine areas adjacent to the national park (Smith, 1990). In 1972, the management plan for Galapagos National Park also pointed out the importance of protecting this environment. Zoning to regulate resource use was proposed in 1975, and a fishery development plan was formulated in 1982. The Marine Resources Reserve was created in 1986, covering approximately 70,000 km² of coastal waters and open ocean (Arcos et al., 1989). In general, all the proposals underlined the need to protect the marine environment under a management plan that reflected the scientific value and significance of the resources for the Islands' economy.

In recent years, there has been increased human interaction with the marine environment through fishing and tourism. Conflicts of use have arisen in some places because the management plan has not yet been implemented and there is no competent administrative authority. Planning exercises orient management toward the regulation of certain fishing activities, but in general, there has been no appropriate regulation of commercial and small-scale fishing, tourist use of marine areas, exploitation of black coral, or the use of sand taken from beaches.

Several effects of human activity on marine ecosystems have been identified. Pressures on some fishery resources have led to a reduction in species. The percentage of codfish capture per unit of effort decreased from 42% in the period 1977-1981 to 15% in 1988-1989. Effects are also reflected in the size of the fish: from 60 cm in the first period to 46-50 cm in the latter. Lobster fishing has increased 300% in the last seven years (Comisión Multisectorial, 1991), while the level of capture per unit of effort has declined remarkably compared to the 1970s. Certain fishing activities have generated conflicts: shark fishing for the sale of only their fins caused a very strong reaction internationally. The government outlawed this practice since it was in conflict with both conservation and tourism.

In general, little is known about the Islands' marine environments, but there is growing interest in underwater tourism. This will provide a new source of opportunities for use of this resource as well as a little-explored field for scientific research. Population growth and infrastructural development lead to pollution, cutting down of mangroves and loss of the shellfish species that live in the intertidal area due to
overfishing. Tourism creates a demand for a series of local handicrafts, usually articles fashioned from black coral. The increased number of visitors causes an increase in the exploitation of this resource, and often the local artisans have to use material imported from the mainland. Black coral can be classified as an endangered species in the Galapagos, as in some regions it can no longer be found.

Institutional, economic, and social realities

Tourism is undoubtedly the most important consequence of conservation activities on the Islands, with positive financial results both for the economy of Ecuador and for the companies that operate in the region. This has created interest in investing in the Islands. The number of visitors has doubled in the last ten years, reaching a total of 42,000 persons in 1990.

Economic expectations generated by tourism have led to a high immigration rate, with an average of 8% for the last ten years. There have been no well-defined policies to orient tourist activities on the Islands, or studies to determine their support capacity. The 1975 management plan establishes parameters for the use of some visitors' sites and draws attention to the damaging impact on the ecosystems resulting from the mass movement of visitors. It also points out the importance of organizing a system so that the local inhabitants may benefit economically. In 1982, the carrying capacity was estimated at 25,000 visitors, unless there is an improvement in the National Park Service's ability to manage the area. The policy was not reformulated, nor was the necessary action taken to strengthen the Park. Nevertheless, 42,000 tourists visited the Galapagos Islands in 1990.

In addition to uncontrolled use of natural resources and introduction of exotic species, pollution from solid waste scattered over almost the entire archipelago has become a difficult environmental problem and leads to the contamination of water for human consumption when organic wastes reach the aquifer. It is evident that standards should urgently be established and respected.

Continuing human migration to the Islands generates additional pressure on the Park. The newcomers must seek places to settle and obtain the basic services to meet their needs. This leads to a vicious cycle of consequences that are not quantifiable in the short term, but not difficult to predict: social tensions, dissatisfaction due to unmet political promises, distrust of the system, and its resulting collapse. Furthermore, the existing public services in the population centers are not prepared to offer appropriate services even to the long-term residents. There are deficiencies in the public health, education, power, water, and sanitation systems. Public administration is not very professional, and this causes problems in the execution of public works and in urban planning. In addition, the actions taken are often based on considerations of a political nature and therefore lack continuity in the long term. The planning systems are based on mainland models, which are usually not applicable to the Islands.
Figure 1

Ecuador: evolution of tourist visits in the Galapagos Islands

- Total
- Ecuadorians
- Foreigners

Figure 2

Ecuador: migration to the Galapagos Islands

Period
1. 1897-1904
2. 1904-1905
3. 1905-26
4. 1926-38
5. 1938-49
6. 1949-56
7. 1956-62
8. 1962-73
9. 1973-80
10. 1980-1990

Period: % annual migration

- 1904: M.J. Cobos assassinated
- Ambato Earthquake
- Tourist Boom
The above situation made it necessary to create a multisectorial commission to prepare a management plan establishing what is the acceptable tourism capacity for the Islands, within the framework of clear conservation policies and nature-oriented tourism (Comisión Multisectorial, 1991). The recommendations put forward include: a freeze on the number of visitors, strengthening of the Park Service, establishment of mechanisms for limiting migration to the Islands, reinforcement of the management capacity of local institutions (such as INGALA and the municipalities), and promotion of development in accordance with the Islands’ potential and limitations. The commission would also perform a follow-up on the plan’s execution.

**Human development on the Islands**

Man’s presence in the Galapagos ecosystem and his influence on the environment, positive or negative, is always a subject of discussion and should be analyzed from the perspective of Man’s integration with the environment, not with the idea that the world would not exist without Man and that Nature should submit to him. Since Man is a “creature of the environment” (Arasa 1982), he can form the greatest and most perfect symbiosis with the environment. But it is Man who must maintain this symbiosis. In the area of science, the islands have drawn the attention of thousands of researchers ever since Darwin visited the archipelago in 1835. These scientists attempt to comprehend or discover the mysteries of evolution in this special natural laboratory which offers a range of examples of evolutionary processes in a small, isolated area.

How has research contributed to the development of the Islands? The spread of scientific knowledge gleaned from the Galapagos has undoubtedly acted as a multiplying factor, bringing the Islands to the attention of not only scientists, but also adventurers and romantics. In this way, the scientist and his work have become a factor in development. Scientists therefore have a responsibility for offering alternatives and solutions to the increasingly critical problems that persist on the Islands from both the ecological and the human standpoint.

In addition, one should not forget the settlers who arrived for other reasons, not necessarily associated with research, such as the pioneers Villamil, Manuel J. Cobos, Valdizán, and numerous “ecological refugees”. In order to understand the process of human migration to the Islands, it is appropriate at this point to identify those who came to settle and their reason for doing so.

**The pioneer settlers**

These are people who came to the Islands more than 30 years ago, settled, and started families. Many of them have links with the Islands dating from early this century. No accurate information is available regarding demographics during the
first half of this century, but it is assumed that the majority were Quichua-speaking peasants and mestizos attracted by false hopes of earning higher incomes on the large estate of La Predial on San Cristóbal Island (Sylva, 1983). Foreigners (some university-educated) arrived and settled mainly on Floreana and Santa Cruz Islands, coping with the rigors of a difficult and hostile environment. For the most part, they settled in the more humid areas and took up farming or else settled on the coast and engaged in fishing. The economy was generally one of subsistence and barter, with a certain amount of fish and livestock sold on the mainland.

The main features of this period were the almost total isolation, lack of state control, lack of national recognition of the Islands' value, and great numbers of foreign immigrants. Today, these pioneers face new challenges and must adapt to a system that is becoming more urban and commercial. This departure from their traditional way of life imposes situations for which they are probably not prepared, including an economic system that depends almost entirely on tourism.

The old residents

This second group consists of settlers who arrived from the late 1960s to the end of the 1970s. They can be characterized as the “back-to-Nature” settlers: a group that fled from the social pressures of the seventies to take refuge in an unaltered natural environment. Most of them took up agriculture and trade, and some went into the budding tourist business, which had already started to show signs of being profitable (Junta Nacional de Planificación, 1975). In general, the goal of these settlers was personal fulfillment rather than economic stability.

The old residents identified with the beauty of the landscape and the refuge they found in the Islands, far from the mundane problems they left behind, made more apparent by the extremely sporadic communications system. Usually, by the time news reached the Islands, it had already become history. Their lifestyle was strongly influenced by the pioneer settlers, from whom they learned many skills for adaptation to, and enjoyment of, the island environment. This group maintains relatively strong ties with the mainland, but does not depend on it.

The new residents

Another group of people started to arrive in the 1980s, drawn to the Islands by the stories of financial opportunities. Some are “ecological refugees” (devastation of their homesteads on the mainland due to earthquakes, etc.), but the great majority come with the idea of investing in the tourist field, since there is a potential for enormous profits to be obtained in a relatively short time. The people who have arrived in the last five years have no long-term relationship with the Islands and their environment. They have a relatively high educational level: twenty-three percent of the persons in this group finished college, 40% stopped at high school, and only 29% have solely a grade school education (INEC, 1991).
The new residents have different behavior patterns that are reflected in their daily interaction with the environment; in the type of construction they select for their dwellings; and in their music and the work they choose. Most of them have very strong ties with the mainland, with the conscious or unconscious assurance that if they should have to leave the archipelago for any reason, they can simply return and find work there.

Social impact

The changes and deterioration in the environment of the Galapagos Islands are evident to those who settled there more than 20 years ago, from both a social and an environmental standpoint. In the Galapagos, there is an ambivalence of customs. On the one hand, there are the pioneers and old residents, and on the other the new generations; the former identified with their surroundings and the latter causing a disproportionate pressure on the environment. This is reflected in the chaotic distribution of different soil management systems. There is no systematic application of practices that are compatible with the Islands' realities. Those with experience in Galapagos understand the different ways of managing the Islands' soils, while practices brought in from the mainland do not always meet with success.
Residents suffer the consequences of population growth; the sewage waters of Santa Cruz trickle into the aquifers from which water is extracted for human consumption, and refuse dumps are focal points for the breeding of rats and other species harmful to human health. There has also been an increase in the level of delinquency on the Islands. Previously, the Man-environment relationship reinforced interpersonal relations, since people needed each other in order to survive in the difficult conditions of the Islands. Today, the value of interpersonal relationships has been displaced by social stratification that depends on the degree of economic or political power attained.

Moreover, almost all residents seek some kind of direct or indirect participation in tourism, either as operators or in the performance of services. However, the majority do not have the necessary experience, training, or financial means to enter the market. Investors from the mainland manage around 70% of the Islands’ activities, and many jobs require a high level of academic training. This situation has led to political and social conflicts that were rare until a few years ago.
Regional economy

“The discovery of natural resources has led Man to make his environment aggressive, thus resulting in countless adaptation problems. Adaptation is the element that allows Man and Nature to co-exist. We live, one could say, in artificial environments created by Man, by scientists and technicians who gave no thought to the side effects or the consequences of their audacious projects” (Arasa, 1982).

For the last 25 years or so, Ecuador has been fostering nature-oriented tourism, whose steady growth has accelerated in the last ten years, partly due to the popularity of the Galapagos Islands, and also because of several public and private entities that have promoted this resource. In addition, tourist operators have become more professional and offer first-class services. In the case of the Galapagos, the economic prospects generated by tourism have radically changed the traditional activities of the region. Traditional means of subsistence, such as livestock breeding, agriculture, and fishing, have taken a second place to the service sector. In 1974, agriculture, livestock, and fishing accounted for 30% of the economically active population (EAP) and services represented 37%; in 1982, 22% of the EAP was agriculture, livestock, and fishing, and 42% services (INGALA, 1984); and in 1990 the percentages were 16% and 40% respectively. These significant changes in production systems and economic activities are closely related to a series of changes that have taken place in the region. The provincial status of Galapagos, increased tourism, the presence of SPNG, INGALA, and other public and private institutions, have all increased the demand for, and supply of, services such as public administration, trade, tourism, transportation and communications.

International tourism to the Galapagos is estimated to bring in approximately US$ 180-200 million per year to the country. The income that remains in the region, however, is quite small (only 11.5%). Most of the profits stay on the mainland to cover the operational costs of the travel agencies, promotion costs, or go directly to the State through taxes (FCD, 1991). The amounts collected in national park entrance fees (US$ 942,000 in 1988) are handed over to the National Forestry Administration in Quito, and only about 20% of this income returns to the SPNG for operational expenses. Most of the population that works in tourism is concentrated on Santa Cruz Island, while public employees are centered on San Cristóbal. Since 1987, there has been an increase in the population engaged in tourism on San Cristóbal, chiefly due to the opening of an airport at Baquerizo Moreno, the provincial capital. A subsistence way of life is still maintained on Isabela Island, where the main activities are agriculture, livestock, and fishing.

Conservation and management policies

The Islands’ physical limitations must be seriously considered when making decisions on policies for human settlement and development. The Islands have no
permanent source of natural fresh water, and the water supply that exists on San Cristóbal, for example, is scarcely enough to meet the needs of the local population. Construction materials are scarce, with most of them located in the national park area. The basic services cannot be maintained due to the lack of adequate reinforcement of the local institutions. Educational systems are limited, and the lack of incentives causes teachers to take up other more profitable activities or return to the mainland. Disposal of solid waste and sewage is a highly problematic environmental challenge. All these factors, together with the Islands' isolation from the mainland, make it inadvisable to develop infrastructures that are not in keeping with the nature of the Islands. Management should be on an integrated basis, where each institution takes a coherent part in decision-making.

How can this be achieved? First, by identifying each institution's field of action, reviewing its mandate and avoiding duplication of effort; secondly, by seeking more joint efforts and by "depoliticalizing" the decision-making; and thirdly, by maintaining a coherent plan for development of the Islands, which is integrated into government policy. All proposed actions should be appropriately analyzed, both scientifically and technically.

The permanent risk of deterioration of the Islands' ecosystems has prompted the Ecuadorian Government to make great efforts to preserve this important heritage. The international community has also shown interest in supporting programs to guarantee conservation of the Islands, particularly UNESCO, WWF, World Bank, and UNDP, among other international organizations and agencies, and foreign governments. As an orienting principle for human activities in the Galapagos Islands it is stated that: "preservation of the Islands' land and marine ecosystems, with their unique elements that have led to their worldwide scientific recognition, take priority over economic interests and conditions their development" (Comisión Multisectorial, 1991). This declaration synthesizes the national position that has traditionally been maintained in regard to the Islands.

The Ecuadorian Government has defined policies in several issues relating to the Galapagos. The chief objectives of the conservation plan include "the preservation and environmental conservation of the island ecosystems." Since it recognizes that tourism is a significant source of income for the Ecuadorian economy but also causes a high migration rate with harmful side effects for both the environment and the inhabitants, the Ecuadorian government bases its policy on the premise that preservation of the Islands' land and marine ecosystems is a condition for any proposed development action in the region.

It is undoubtedly human settlements that cause the greatest problems in the region. Management strategies require the establishment of mechanisms for reducing population growth to levels similar to the national average by: restricting tourist installations; improving training systems in the local community; strengthening the education system; and orienting tourism. Selectivity in the types of visits to the region is proposed, as well as limiting operations to facilitate a functional administrative structure.
In order to minimize pressures on black coral, artisans' unions will be encouraged to diversify their activities by including ceramics and T-shirt manufacturing and the use of certain types of wood for handicrafts. The resident community will be guided so as to take part in tourism without causing damage to the natural resources of the National Park or Marine Reserve. Regulation of urban and agricultural expansion should hopefully discourage human migration to Galapagos, minimize the uncontrolled extraction of resources, permit preservation of the Islands' ecological features, and allow for recovery of degraded areas.

**Final thoughts: Galapagos for Man or Man for Galapagos?**

This point should perhaps form part of a philosophical discussion aimed at defining Man in relation to the Islands or the Islands in relation to Man. It might be appropriate to begin with the initial formation of the Islands, when the first streams of lava gushed forth from the earth to the surface of the ocean floor. The slow accumulation over thousands of years and the Islands' final rise from the sea was the beginning of a gradual population of species, which being isolated in the middle of the ocean developed unique features that distinguish them from other known species around the world.

Man is an element of the biota, and therefore should contribute to it, both as a living being and as a social being. His current reasoning about his environment should not lead him to destroy it; human beings should contribute to the continuity and maintenance of life - their own and that of all the species that surround them. They should form part of the ecological system and feel deeply that it is their own.

When UNESCO designated the area a World Heritage site, it did so in the name of all mankind; it made us responsible for the protection of these fragile natural resources. We should all share moral obligation to support the efforts made to conserve the Galapagos Islands, so that future generations may be proud to acknowledge that they are descendants of the generation that assumed the responsibility of preserving this heritage.

**Editorial update:** The same law that created the Ecuadorian Institute of Forestry, Natural Areas and Wildlife (INEFAN) in August 1992, also elevated the administrative status of Galapagos National Park. Current efforts aim at the ratification of a special "Galapagos Law", that could convocate a Special Directorate for the Islands and decentralize the administration by assigning certain executive liberties to its director. According to official figures, the Galapagos Islands have been visited in 1994 by approximately 54,000 visitors (40,600 of which were foreigners), spending an estimated total of US$ 55 million. The entrance fees for the national park have been raised to US$ 80 for foreign visitors and to US$ 5 for Ecuadorians. The tour operators of Galapagos have been given permission to take
a combined total of 110,000 tourists per year to the Islands. The local population is increasing by about 8% per year, meaning that the population doubles every eight years. Currently, around 14,000 people reside permanently on the Islands. If this trend continues, between 25,000 and 30,000 people will live in Galapagos in the year 2002, increasing the current problems of pollution, sewage and solid waste (among others). In order to solve the area's problems and to foster integration and identification of the local people with their environment, the Permanent Commission for the Galapagos Islands maintains public discussions and participative planning meetings. A management plan for the Marine Reserve (put into force also in August 1992) does not receive due respect by several of the fishing sector authorities. Conditions in the marine environments of the area have worsened and many companies put pressure on INEFAN and the Ministry to allow extraction and commercialization of sea cucumbers (Isostichopus fuscus) on a large scale. The Charles Darwin Foundation estimates that although legal permits established a maximum of 550,000 sea cucumbers to be extracted during a two-month period in 1994, more than 5 million individuals of these echinoderms have been exported to Asian countries, where they form part of the traditional diet (pers. com. A. Carrasco, March 1995).

Additionally, severe problems for the marine and island environments of Galapagos are caused by the presence of factory ships (that take great amounts of tuna) and mostly Japanese trawlers, which specialize on the capture of sharks (cutting their fins for export and dumping their bodies in the ocean). Several reports claimed that the cucumber fishermen also collect sea horses, sea snails, sea urchins, and black coral. When the cucumber fishery was officially closed by the authorities, due to abuses that occurred in the first two months, the people involved in such lucrative, yet devastating, enterprise did not accept the decision calmly. During the first days of January 1995, they took over the installations of the Park Service and the Darwin Station, keeping all the people inside as hostages. They threatened to kill the tortoises held in captivity at the Station and to start fires on little islands like South Plaza and Santa Fe. The minister of Fisheries met with the fishermen and the people involved in these actions and after getting pressure from environmental groups, the ecotourism association, travel agents, and tour operators, he felt in the position to close the cucumber fisheries until October 1995. The mid-term goal of the mentioned pressure groups is to persuade the Ecuadorian government to close all types of industrial fisheries in the Galapagos, to eliminate all resource exportation from the Islands, and to include the marine area within the National Park, which would be managed by a single institution (pers. com. M. Green, January 1995).

Two new kinds of introduced exotic wasps that impact the native fauna and flora have been reported. INEFAN plans to begin an inspection and quarantine program to stop further introduction of exotic species. In 1994, a great fire on Isabela Island destroyed 4,600 ha of mostly secondary forests. As a side effect of this conflagration, more than 85 carcasses and shells of recently killed Giant Tortoises were found, which indicates a dramatic increase in 1994 in the poaching of this strictly protected species, seriously endangering its survival. Given this situation, several tortoises from the newly established breeding center in Villamil were re-introduced to their natural habitats on the southern slopes of Sierra Negra Volcano.
On a more positive note, international cooperation has improved considerably, with scientific research and park management projects receiving support from UNEP, UNESCO, WWF, USAID, the World Bank, the European Community, and the Frankfurt Zoological Society. With the technical and financial support of the Spanish Government, nature interpretation centers are under construction on all the inhabited islands (pers. com. A. Carrasco, March 1995).
Machalilla National Park: community involvement and sustainable use

Carlos Zambrano Bravo

Abstract: When Machalilla National Park was created in 1979, the majority of its inhabitants had no idea of what the Park was or the functions it performed. In fact, the local population saw the declaration of the Park as an unnecessary government decision, which only served to further complicate their already tenuous socio-economic situation. This conflictive attitude of the local people endangered the survival of the Park and was successfully softened via informal educational methods and small sustainable development projects in communities in and around the Park. In the village of Agua Blanca, located within the Park, the mutual interest in the conservation of an archaeological site played an important role in the change of attitude of the local population toward “their” Park.

Machalilla National Park is located on the Ecuadorian coast in the southern part of Manabi Province. It has an extension of 55,095 ha and comprises a continental area, the islands of Salango and La Plata, and a part of the Pacific Ocean extending two nautical miles from the coastline. Mainly for political and geographical reasons, this park was not established as a single territorial unit but has been divided into three clearly differentiated sectors: the offshore islands of Salango and Isla de La Plata with its outstanding coral reef formations and sea bird populations; and two parts on the mainland extending from the coast into the highest ridges of the Cordillera de la Costa that reach up to 800 meters above sea level.

Two basic types of vegetation can be distinguished in the mainland section of the park: dry forest and fog forest. The latter can be found several kilometers inland on the highest hills. This fog forest of the ridgetops rapidly turns into dry forest on the middle and lower slopes, separated by only a very narrow band of transitional moist forest (Parker / Carr 1992). Even though the original dry forest, that covers 60% of the Park’s area, has been greatly impacted, it is of ecological importance since Machalilla National Park is the only protected area in Ecuador intending to conserve this biotic province.

Apart from its natural value, the Park contains outstanding archaeological resources comprising areas with scattered ceramics and lithics, as well as large, stone-structured, architectural complexes. In fact, all sites in Machalilla National Park are of some archaeological interest. Based on research performed in recent years, (particularly in the Buena Vista River valley and the Agua Blanca area in some 180 exploration sites) various Ecuadorian coastal cultures have been identified in the area, ranging from Valdivian, Machalilla, Chorrera and Bahía to Manteña.
Despite this, the archaeological value of the National Park is still little known. It is possibly the only area on the Ecuadorian coast, however, that has not undergone major destruction, in contrast to other coastal areas where archaeological remains have been subject to illegal plundering and hence to national and international trafficking.

Main management problems

There are several settlements located within the park boundaries and it is estimated that about 30% of the park area is privately or community owned. Incorrect use of natural resources, mainly in recent times, has caused a strong negative impact, particularly on the vegetation and wildlife. Especially birds and mammals have been hunted as sources of protein. Deforestation has also caused an evident reduction in soil humidity and the impoverishment of water sources: most of the streams have dried up. Other problems that create difficulties are the presence of domestic livestock in the park and the extraction of timber.

When the Park was created in 1979, certain measures were taken to restrict resource by the inhabitants. This caused a breach in the relations between the Park and the communities. Finally, management options had to be found changing the population's unfavorable attitude towards the Park.

The Agua Blanca community's integration

With the creation of Machalilla National Park, one of the communities affected was Agua Blanca. The restriction on some subsistence activities, particularly forest exploitation for timber, charcoal and firewood generated animosity of the inhabitants toward the Park, which they regarded as an unnecessary creation of the State. Since this attitude threatened the stability and even the existence of the unit, a new policy of developing the inhabitants' environmental awareness was applied, with the intent that Machalilla National Park be a catalyst for community development among the local residents. To this end, the 1986 management plan established some alternative support projects that intended to benefit the small-scale farmers, as well as the Park's ecological health:

- reforestation with native species in communities where the soil has been over-used, thus promoting recovery of the natural vegetation;
- creation of community vegetable gardens with ecological features (where there is enough water);
- promotion of small-scale livestock-breeding with rational management based on the principle of sustainable development.

In 1988, a project called "agricultural vegetable cultivation and hog development at Agua Blanca" was set up. The Agua Blanca community was selected due to its
location in the center of the Park, its population of 42 families, their willingness to work, and the overuse of forest resources by the inhabitants. The following strategies were instrumental in achieving the participation of the community:

- inclusion of three leading community members in the Park's activities;
- bilateral participation in decisions affecting the community and the Park;
- integration of the community members in archaeological research;
- environmental education (conducted by professional instructors);
- provision of training courses (to prepare them to work as tourist guides or park guards, as well as general courses on natural resource management);
- promotion of responsibility in the protection of cultural resources; and
- the development of the local archaeological site for tourism.

Taking into account the opinion of the Agua Blanca community, the following four action points were considered and carried out together:

1. review of the management plan (conservation objectives and zoning);
2. integration of the village with the Park (awareness, job possibilities);
3. protection of archaeological sites (enclosure of four structures, protection of each structure, drainage trenches, bridges, footpaths with steps);
4. provision of basic tourist services (information center, guides, rest huts, signposts, garbage cans, sale of local foods, archaeological museum, parking lot).

These measures created confidence for the establishment of the conservation project, which today is an example of sustainable development and effective park-community and Man - Nature relationship in Ecuador.

Conclusion: Integration of the Park and the community for the defense of natural and cultural resources

The only way to prevent the deterioration of the Park's natural and cultural resources is to involve the communities. This is a difficult objective when one considers that the majority of the people who live in the Park make use of the protected wilderness area for many purposes: traditional agriculture, cattle and goat grazing, logging, hunting, and brick-making. The park administration considers that part of the sustainable use component consists in influencing conduct regarding the rational use of natural resources, by motivating the communities connected with Machalilla National Park to decide and act on their own account in favor of the Park. Environmental education programs conducted by trained teachers from local schools played an important role in changing people's attitudes.

In 1988, based on the park integration experience with the Agua Blanca community, work was begun on agricultural projects with ecological features in several other communities. Experience has shown that one cannot work in a protected area in an isolated manner, seeing only the national park and not the needs of the human population. One must work under the new concept of rational use of park resources with a sustainable yield. This implies ethical responsibility for the future and respect
for essential ecological processes. A protected area's educational campaign in the local communities may be considered successful once the population's collaboration with the Park, like in the case of Agua Blanca, consists of:
- establishing local partners in the management of the Park's environmental problems;
- informing other communities about environmental problems and ways of solving them;
- forming community ecological youth clubs; and
- maintaining mutual discussions of community problems and with the park administration.

The park's collaboration with the community should be based on:
- carrying out environmental education programs to transmit knowledge, create environmental consciousness and seek joint community solutions;
- making the community aware of the Park's objectives;
- facilitating inter-institutional coordination in seeking solutions to community problems that will serve to support community organization; and
- taking part in practical activities, such as the construction of seed-beds, vegetable gardens, reforestations, or the search for economic alternatives.

The administration thus acquires the necessary experience that will benefit the local communities and, at the same time, help to conserve the integrity of the Park.

Editorial update: Among the threats for Machalilla National Park, a report of the "Parks in Peril Program" mentions: uncontrolled resource extraction by local communities, contamination by solid wastes and sewage, air pollution caused by a local fish factory, introduced exotic animals, and uncontrolled tourism in La Plata island (INEFAN / Fundación Natura, 1994). The park administration's environmental education programs for the local population were slightly modified and are now always combined with the search for economically viable income alternatives. In order to better organize this task, the administration has divided the protected area into three sectors: a coastal sector with fishing and tourism possibilities; a central sector with arqueological, touristic, and artisanal potentials; and the interior sector, where several productive activities are fostered, like community vegetable gardens, gathering and semi-elaboration of ivory-nuts, agroforestal activities, and reforestations with native tree species. This management modification arose from the understanding that the development of an environmental sensibility can not be expected from a population living in extreme poverty. In addition, the average local dweller is generally not able or capacitated enough to identify the best potential use of the resources that surround him. He usually only knows of the direct, consumptive uses. Special training programs have to be developed to foster understanding of non-consumptive uses like tourism, handicrafts, or the management of arqueological sites. At present, workshops are being held in all the settlements within or near the Park in order to identify the community interests and potentials and design adequate development strategies (pers. com. C. Zambrano, April 1995).
References


References


French Guiana

Protected areas and human activities

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Protected areas and human activities in French Guiana

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Abstract: The present state of conservation in the French Overseas Department of Guiana is quite good, due to the low density of the human population. However, the successful conservation of an area with very diverse flora and fauna requires the careful evaluation of any development project. Following an introduction to French Guiana’s environment (landscapes, vegetation, and wildlife) this chapter presents an analysis of human activities and their environmental impacts (timber exploitation, shifting and modern agriculture, dam construction, mining, tourism, and the operation of a space center). A critical evaluation of the history of nature preservation in French Guiana is followed by a presentation of the protected natural areas that have already been designated or that are proposed.

French Guiana is situated in the northern part of the South American continent, bordered on the north by almost 300 km of the Atlantic Ocean, on the west by the Maroni River (its border with Suriname), on the east by the Oyapock River (which separates it from Brazil), and on the south by the watershed between the Amazon basin and that of the Guianas. This French overseas department (located between 2° and 6° north latitude and 52° and 57° west longitude) occupies part of the Guianan Shield, which is made up of crystalline and metamorphic Precambrian rocks.

The climate is equatorial, with mean temperatures ranging from 26° to 30° during the day and from 18° to 28° at night. High temperatures of over 30° are common during the dry season. There are two principal seasons: the rainy season, from the end of November until the middle of July, interrupted by a short dry period known as “the little March summer”, and a dry season lasting from August to November. Mean annual rainfall is usually over 2,000 mm; in some regions it may exceed 4,000 mm, even reaching 8,000 mm at certain spots.

In outline, Guiana has three major ecosystems: the coastline, the rivers and the interior uplands. The coastal plains consist of rocky or sandy beaches, mangrove swamps, mudbanks and interior wetlands. The rocky shoreline is exceptional for northern South America, since between the Amazon and the Orinoco the Guianan Shield only reaches the coast in French Guiana. About 10% of the coastline is sandy beaches, with yellow sands serving egg-laying for many sea turtles, such as the green turtle (Chelonia mydas), the Olive Ridley turtle (Lepidochelys olivacea) and, above all, the leatherback turtle (Dermochelys coriacea). The mangrove swamps that cover the rest of the coastline (over 80%) vary in length from only a few meters
in the Sarcelle savanna region to over ten kilometers at the mouth of the Sinnamary river. They consist almost entirely of black mangrove (Avicennia germinans). These mangrove swamps are important nesting sites for birds like herons, egrets, and the scarlet ibis. Lastly, the mudbanks provide refuge for many migratory birds that divide their lives between the Guiana coasts in winter and their nesting places in the north of Canada and the United States in the summer. Behind the coastal belt are almost 200,000 hectares of wetlands, covering a large part of the recent coastal plain and extending mainly towards the east of Cayenne with the Kaw Plain and the expanses of the Approuague and Oyapock Rivers. The “dry savannas”, which are situated on the ancient coastal plain, from Cayenne to Organabo, are low savannas on white sand soils, and high savannas on yellow ferralic soils. They are subject to fires in the dry season.

The rivers, which act as routes of human penetration, flow towards the north, distributed in a fan-shaped manner from the Maroni to the Oyapock Rivers. Far from the effects of tidal influences, falls and rapids succeed one another, formed by rocky masses that impede the rivers’ flow, and some of which are impassable most of the time, depending on the water level.

Lastly, the interior zone that covers over 80% of the country, consists mainly of low hills with relatively steep slopes, seldom over 100 meters high. From the newest parts of the granite base arise the so-called “Inselbergs” in the “rocky savannas”. These outcrops of rock, occurring principally in the southern half of the country, may be simple granitic slabs scattered over the hillsides, or veritable domes. The most spectacular of these is the chain of hills called “Tumuc-Humac” in the extreme south-west (and shared with Suriname), which is over 700 meters high. The highest reliefs are to be found in the southern-central region, on a base of extrusive rock: great table mountains (“tepuis”) between 600 and 800 meters above sea level.

Flora and vegetation

French Guiana has over 8 million hectares of undisturbed forest, while low herbaceous zones and secondary formations occupy under 5%. The works of G. Cremers (1984a and b) and M. Hoff et al. (1988, 1989a and b) show that Guiana has quite high floristic diversity. Some 4,900 species have been reported, over 4,000 of which are vascular plants, and it has been estimated that there are over 6,000 plant species, 4,800 of which being vascular. About 170 species are endemic to French Guiana (Cremers et al., 1994). Around twelve new species for science and 200 new species for Guiana are identified every year. The most common type of vegetation, rainforest on well-drained ferralic soils (de Granville, 1979, 1981, 1988), has an estimated 746 tree species for Guiana as a whole.

The greatest species diversity is found in four areas: Saül and the central region; Kaw-St. Georges; Montagnes de la Trinité-Paul Isnard; and Tumuc-Humac. Other
areas with a relatively high species diversity include: the Maroni valley; Apatou-St.Laurent; the Cayenne-Régina route; and the mountainous area between Maripasoula and Inipi, including the upper valleys of the Mana, Sinnamary and Approuague Rivers.

Fauna

Except for a few species found only in the coastal belt, such as the white-tailed deer (Odocoileus virginianus), the red-bellied macaw (Ara manilata), the red-shouldered macaw (Ara nobilis), or restricted to very specific habitats (such as the Guianan Cock-of-the-Rock, Rupicola rupicola), most animals found in French Guiana are distributed throughout the Department, as well as in Suriname and the Amapa state of Brazil. French Guiana’s 150 species of mammals include:
- eighty species of bats;
- five species of ungulates: the Brazilian tapir (Tapirus terrestris), the largest of the forest mammals, usually found near rivers and creeks; two species of peccaries (Tayassu pecari and Tayassu tajacu); and two deer (Mazama americana and Mazama gouazoubira);
- two species of sloths (Choloepus didactylus and Bradypus tridactylus), which make up 70% of the biomass of tree mammals;
- the kinkajou (Potos flavus) and the South American coati (Nasua nasua), both belonging to the raccoon family (Procyonidae);
- various monkeys, notably the red howler monkey (Alouatta seniculus), the black spider monkey (Ateles paniscus), two capuchin monkeys (Cebus apella and Cebus nigrivitatus), the Guianan saki (Pithecia pithecia), the common squirrel monkey (Saimiri sciureus), and the Golden-handed Tamarin (Saguinus midas);
- predators, including the jaguar (Felis onca) and the puma (Felis concolor).

French Guiana’s avifauna is not as rich as that of the neighboring countries, due to its history, geographical position, small size, limited diversity of habitats, and other ecological and physical parameters. Nevertheless, 714 bird species have been registered. In addition to the species that breed there, a number of northern and southern species come to spend the winter in this region. Due to the specific richness of their populations, and their often surprisingly large numbers, the birds of the heron family represent a major component of the resident avifauna of Guiana’s aquatic environments. These birds, concentrated principally in the narrow coastal belt, are particularly sensitive to human disturbance.

Human population

The outstanding features of French Guiana are its sparse population (114,808 inhabitants, according to the 1990 census, in a vast territory of 90,000 km²), its few
industries, and its little-developed agriculture. The coastal belt contains 90% of the
inhabitants, due to its poles of attraction: Cayenne, the capital, and its vicinity (57%
of the population); Kourou and Sinnamary (16%); with the activities of the Guiana
Space Center; St. Laurent and Mana (17%). The remaining 10% live on the banks of
the main rivers: the Approuague (2%), the Oyapock (2%), and along the Maroni
(6%). This river population consists essentially of communities that have preserved
their traditional way of life, extracting most of their resources from the natural
environment.

The main settlements, particularly Cayenne, are dominated by tertiary sector
activities; the present Creole community is essentially urban. The rural sector has
become an absolute minority. In some regions, the traditional subsistence economy
is still maintained, while in other areas, the communities appear to be progressing
towards more modern practices, particularly with the arrival of young farmers. Of
the 114,808 inhabitants 57,865 were born in French Guiana; 6,334 come from other
French overseas departments (such as Guadeloupe and Martinique); 13,403 are
from Metropolitan France; and 37,206 are foreigners. These foreigners constitute a
large immigrant population, especially in the last thirty years. All the development
programs and the recent expansion of space activities, have given rise to various
waves of immigration (Haitians, Brazilians, etc.). In addition, Guiana’s economic
situation, particularly relatively high wages, attracts a large number of illegal
immigrants.

Lastly, French Guiana is inhabited by six Amerindian communities belonging to
three great South American linguistic families: the Carib family (with the Galibi and
Wayana tribes); the Tupi family (with the Wayapi and Emerillon tribes); and the
Arawak family (with the Arawak and the Palikur tribes). These tribes, who either
lived in the region prior to the discovery of the New World or are descendants of
ancient migrations, continue to live more or less isolated from the rest of the
country’s population, and have thus managed to preserve their cultural identity,
their language, their subsistence economy, and their social organization. In addition,
except for a small amount of racial mixing, they have remained ethnically pure.
They are semi-sedentary and maintain a balance between itinerant agriculture
(shifting cultivation on burned plots), fishing, hunting, and gathering. On the coast,
the Galibis live in Awala-Yalimapo (630 inhabitants) and Iracoubo; the Palikurs
in Macouria and the lower Oyapock River, and there are some Arawaks near Cayenne.
In the interior, the Wayâpis, Emerillons and Wayana are established on the upper
Oyapock and Maroni Rivers.

There are also the “bush-negroes”, communities that arose between the second
half of the seventeenth and the end of the eighteenth century, consisting of escaped
slaves from the plantations of Suriname who eventually settled along the Maroni
River: the Saramaka group (who rebelled in 1684), the Djukas and Paramakas
(around 1750), the Matawais (1767), and lastly the Bonis or Aluku Nengês (around
1773). Although these groups took refuge in French Guiana from the time they were
formed, they did not start to extend along the banks of the Maroni River until the
Map 1

French Guiana: population distribution

1. Cayenne and outskirts (57%)
2. Kourou-Sinnamary region (16%)
3. St. Laurent-Mana region (17%)
4. Maroni (6%)
5. Oyapoc (2%)
6. Saül

Tribes:
G Galibi
B Palikur
E Emerillon
Wi Wayapi
Wå Wayana
A Arawak
D Djuka-Samaraka
B Boni
Map 2

French Guiana: human activities

Atlantic Ocean

- southern limit of timber extraction
- traditional agriculture
- modern agriculture
- priority areas for conservation
- Guiana Space Center
end of the nineteenth century. They succeeded in recreating a subsistence economy based on itinerant agriculture, hunting, fishing, and gathering, without neglecting the contributions of colonial economy, temporary salaried work that appears to have commenced around 1860 with the use of their knowledge of the jungle, and their capacity as woodcutters and canoe builders. Due to their skill in maneuvering canoes up and down the rivers in all seasons, they play a key role in all communications with the interior of the country. Recent events in Suriname have led to an influx to French Guiana of over 10,000 bush-negroes (Saramakas and Djukas) not included in the 1990 census.

**Principal activities and environmental impact**

Human impact is most significant in the coastal strip, where the majority of the activities are concentrated: urban development, agriculture, industry, fishing, road construction, and port and airport activities. The rivers are also centers of human activity. Towns and villages develop on the river banks, and also at places where there is access to hunting sites or exploitation of alluvial gold. The large rivers are traffic centers for the river communities and serve to support the growing tourist activities. In the interior, human impact on the forest ecosystem remains moderate and is limited to the northern quarter of the country, the road network and other traditional penetration routes.

*Timber exploitation.* Some 25 enterprises holding from 2,000 to 25,000 hectares currently exploit approximately 250,000 hectares or 3% of the forest area (see Map 2). About 50 tree species are well known for their excellent quality and are highly valued. Three of these species account for two-thirds of the timber felled: “Angélique” (*Dicorynia guianensis*), “Gonfolo” (*Qualea* spp.), and “Grignon” (*Ocotea rubra*). Exploitation depends on the transportation infrastructure and there is presently a 400-km network of logging roads. Most of the timber production, around 6,000 m³, comes from the extraction in these vast concessions of a few commercial species, and the yield of 10 to 30 m³ per hectare is quite small when compared to the estimated biomass of 300-400 m³ per hectare (Gazel, 1979). While this method does not endanger the survival of forest *per se*, it is detrimental to the forest ecosystem. Regeneration and wildlife are both adversely affected: the one by the destruction of small and medium-sized trees and the impoverishment of large seed-bearing trees, and the other by the noise of the machines and by the creation of tracks (which are then taken advantage of by hunters). The National Forestry Office (*Office Nationale des Forêts*, ONF), has estimated the future long-term exploitable area at one million hectares, representing 2,000 km of logging roads. Economics currently restricts logging to within 60 or 70 km from the coast. Thus the southern limit to timber exploitation is fairly well defined. In addition, studies are being carried out for selective reforestation, which should also lead to improved productivity.
Traditional agriculture. This involves small areas (>1 ha), where the trees are felled and burned. This type of "slash-and-burn" agriculture is customary among Amerindians, bush-negroes and Creoles, and it is practiced in the coastal belt, along the Maroni and Oyapock Rivers, in the lower Approuage region, and around Maripasoula, St. Elie, Saül and Camopi. These small plots are exploited for two or three years and then left to natural regeneration. Since the population living in the interior of the country is still small, these practices have not had significant consequences for the flora or fauna. Their total area in 1989 was 5,593 hectares, or 27.1% of the agricultural land in use, and only 0.26% of the territory. In the same year, 89.5% of the parcels under cultivation were smaller than 5 hectares, as opposed to 4.5% that were over 10 hectares and represented 56% of the agricultural land in use.

Modern, mechanized agriculture. From 1976 onwards, the search for a more productive type of agriculture led to the exploitation of relatively large areas using more intensive cultivation methods. This required total deforestation, and the quality of the land thus obtained depended on the methods used, the skill of the tractor operators, and, above all, on the nature of the soil and the drainage conditions. Most jungle soils are poor and require large amounts of fertilizers, since they have an impermeable horizon and poor vertical drainage. In such areas, this modern type of agriculture has often been a failure. The areas under exploitation in the coastal and sub-coastal zones have been used for livestock husbandry and fruit-tree cultivation. Rice is cultivated on 2,300 hectares of land reclaimed from the sea in the humid zones of the west. For the future, some 50,000 hectares have been located and inspected in the west of French Guiana which could yield good production without too many problems from the standpoint of relief and drainage.

Fishing. This is French Guiana’s main export activity (60%). The continental shelf extends over an area of almost 130,000 km² and the waters are rich in shrimp and fish. Small-scale fishing of diverse species should be distinguished from industrial fishing, which specializes in shrimp. The selectivity of the shrimp industry results in the destruction of a large quantity of fish, which are then dumped back into the ocean.

Petit Saut hydroelectric dam. Electric power is presently produced by thermal generators, making it necessary to import fossil fuels. The hydroelectric dam now under construction by the French national power company (Electricité de France) at the site known as Petit Saut (Little Falls) will flood 300 km² of forest. The impact on the environment will be significant, and the degradation of organic materials, along with the decrease in dissolved oxygen, will cause modifications in the dynamics of the aquatic populations which cannot yet be estimated due to lack of data gathered at other similar dams. At all events, the contractor has been required to perform a scientific impact study before, during and after conclusion of the work.

Mining. The main mining activity at present is gold extraction (over 800 kilos in 1990). This involves a large number of small operations which extract alluvial gold
with the aid of dredges mounted on rafts. These operations take place on the principal rivers, where the deposits are already running out. There is interest in the industry to move toward the exploitation of old terraces and alluvial deposits (thus involving the use of large quantities of water to remove the sediment from the clayey ore), or the exploitation of gold veins (which would require substantially more investments). Impacts on the natural environment are many: the volume of the materials treated and the water used, the possibility of pollution during extraction procedures (mercury and cyanide), and associated hunting and fishing.

**Guiana Space Center.** This base (96,000 ha) is located near Kourou, a town 50 km west of Cayenne. Since 1968 it has been the operational launching base of the National Center for Space Studies (Centre National d'Etudes Spatiales) and the launch site of the European Ariane rocket. The ELA 3 area, where the Ariane 5 launcher is being prepared, contains several zones: launching, preparation and testing of the explosive propellents, an industrial zone with various factories: solid propellents, and liquid hydrogen and oxygen. All these activities involve considerable pressure on the environment.

**Tourism.** This industry has long been limited by the lack of appropriate infrastructure and is now being developed with the support of the Regional Agency for the Development of Tourism and Recreation (Agence Régionale pour le Développement du Tourisme et des Loisirs, ARDTLG). The particular characteristics of French Guiana, however, do not permit envisioning mass tourism, but rather adventure tourism. Over 14,000 tourists visited Guiana in 1988, chiefly travellers from the Antilles and France. This type of tourism is oriented towards the discovery of Guiana’s vast natural areas (river trips, trekking), its fauna (the egg-laying of the leatherback turtles), and the cultural life of the Creole and other communities. Carnival and the Space Center are also great attractions. Some regions such as Kaw and Awala-Yalimapo have an extremely rich natural and cultural heritage and attract visitors, despite the lack of infrastructure for both domestic and foreign tourists. The creation of a Regional Nature Park (Parc Naturel Régional), including these two municipalities, should help to bring benefits to the local communities.

Human presence and activities in the priority areas for nature protection pose some problems, particularly in the coastal strip, where there is strong demand for land for agriculture, grazing, and housing, in addition to the disturbances associated with the fishing industry and just the movement of boats and airplanes. The difficulties are particularly evident in the extreme western part of the coast, where Man’s presence is scarcely compatible with the natural equilibrium: the simultaneous existence of turtle-nesting beaches on the one hand, and on the other, the Amerindian communities that practice small-scale fishing to satisfy their food requirements but also to sell their production in neighboring markets. This region, which was made a commune two years ago, has experienced an increase in its population, not only through natural growth but also through the arrival of Amer-
indian immigrants from Suriname, thus leading to an acute demand for arable land, marine resources, and natural resources in general. With fishing that is performed according to the tides, marine turtles get caught in the nets and it is difficult to prevent their death by drowning; in addition, the fisherman’s net usually gets damaged. Since natural resources are not abundant, the Galibis now are seeking improved fishing methods (bigger boats, larger nets and longer fishing periods), as well as better resource conservation methods.

A solution must be found to protect part of the nesting beaches as a reserve area, and to maintain the legal protection of the turtles and increase the fishing capacity of the region’s inhabitants. In the Kaw Plain area, the inhabitants obtain part of their income from fresh-water fishing, in which they unintentionally trap and kill black caimans (Melanosuchus niger). Additionally, tourism development of the area requires the prohibition of hunting, another traditional resource.

**Historical record of nature conservation**

The first and only reserve created is that of La Miranda, situated on the Grand Matoury Massif near Cayenne, with an area of 166 ha. It was decreed a nature reserve (réservé naturelle) on July 4, 1942, and in 1967 was transferred to State ownership. That year, too, R. Oldeman of ORSTOM, the French Institute of Scientific Research for Cooperative Development (Institut Français de Recherche Scientifique pour le Développement en Coopération) and F. Hallé of Montpellier University proposed the conservation of a large area along the Dégrad Saramaca route near Kourou on the Montagne des Singes (Monkey Mountain). A 5,000-ha area was studied in 1970 between the Cascades and Tonnegrande Rivers; this reserve, which is easily accessible near the coast, should have both an integral protection zone and a zone open to the public. At the same time, plans were made for a study to create a reserve in the interior of French Guiana, covering a larger area, the first stage of which would involve Saül, the Matarony Bay and the Atachi Bacca Mountains, as well as Camopi, the Tumac-Humac and the southern border.


The following year, Ph. Blancaneaux (1973) of ORSTOM proposed a coastal reserve near Mana. As a result of a convention between ORSTOM and the Environment Ministry (Ministère de l'Environnement) M. Condamin (1974, 1975) proposed
an ecological study of the Guiana coast with a view to the creation of nature reserves, consisting of four projects:

- part of the mangrove swamp between Sinnamary and Iracoubo, well-known as a nesting site for the scarlet ibis (*Eudocimus ruber*);
- the Sarcelle savanna on the banks of the Mana estuary, extremely rich in birds, particularly ducks;
- the Kaw Plain, consisting mainly of swampy areas, which are home to one of the last colonies of black caimans (*Melanosuchus niger*), as well as to hoatzins (*Opisthocomus hoazin*); and
- Grand Connétable Island, at the mouth of the Approuague River, the nesting place of numerous sea birds.

J.J. de Granville of ORSTOM (1975) proposed the first set of forest reserves in the Department. They were essentially the most interesting regions because of their rich flora or the beauty of their pristine forests, or were particularly vulnerable due to their small size. These naturally fall into 2 groups: mountain tops over 500 meters high, which are very scattered, and where the flora and vegetation differ from those of the plain; and zones where it is possible to preserve a representative sample of the main plant communities, thus ensuring the conservation of a sufficiently rich and diverse genetic capital. The proposed reserves were:

- Lower Mana (48,400 ha) with jungle-type vegetation on very localized white sandy soils to the northwest of the coastal marshes, thus extending the Sarcelle savanna project proposed by Condamin.
- The Kaw Plain (46,000 ha), consisting entirely of herbaceous marshes, mangrove swamps and swampy forests of *Euterpe oleracea* palm trees, also proposed by Condamin for fauna conservation.
- Montagne des Trois Pitons (Three Horn Mountain, 3,600 ha), a rocky outcrop covered with xerophytic vegetation, isolated in a subcoastal swampy area in the northeast of French Guiana.
- The St. George de Oyapock area (19,200 ha) with a swampy jungle rich in Amazonian plants along Gabaret Creek.
- Montagne Tortue (Turtle Mountain, 3,800 ha) and Matarony Creek (19,600 ha), southern forest areas on schist and quarzite bedrock (near Regina), and in one of the rainiest regions, which presumably formed part of the forest refuge during the dry climatic periods in the Pleistocene.
- The Paul Isnard area (56,000 ha), also a particularly rainy place, including Lucifer Mountain and the Dékou-Dékou Massif.
- Montagnes de la Trinité (Trinity Mountains; 20,000 ha), an area of irregular topography with outcrops of crystalline rock on its northern half and a table mountain ("tepui") of extrusive rocks on the south.
- The Atachi-Bacca Hills (790 m, 34,400 ha) and the Central Plateau (830 m, 145,000 ha), the highest points in French Guiana, great plateaus covered with montane forest on a laterite base.
- The Camopi area (17,600 ha), which includes the Alikéné hills, characteristic of the eastern forest on crystalline rocks.
- The Tumuc-Humac area (90,800 ha), rich in large, spectacular granite outcappings, a refuge for interesting xerophytic species. They are French Guiana's largest "inselbergs", which also contain archaeological vestiges of the nomadic indigenous tribes of the Stone Age (Granville, 1978).
- The vast Sali area (133,600 ha), including different mountain ranges (Belvédère Hills, Galbão, Continent, la Fumée, Pic Matécho, etc.), is the area richest in biodiversity and houses numerous endemic or rare species. There is also a magnificent tall forest, where many botanists and other researchers have worked along 70 km of paths opened up by Oldeman between 1965 and 1969.
- Lastly, two suburban forest parks (parcs forestiers suburbains) open to the public for enjoyment and education: Montagne des Singes (17,000 ha), south of Kourou, and Cascades Estuary (5,400 ha), 20 km south of Cayenne.

Threats to the integrity of the natural environment are now becoming more acute due to the proposals for exploitation of vast forest areas by the paper industry. Fortunately, the conservation projects have not been detained. Legal and financial support was sought in 1976 for the establishment of natural area protection: the Kaw, Sinnamary-Iracoubo, Lower Mana and Sali projects were proposed as part of a national park, but the idea was soon abandoned.

It was not until 1978 that the Lower Mana and the Sinnamary-Iracoubo mangrove swamp were proposed as nature reserves, through the Antilles-Guiana Regional Architecture and Environment Delegation. Although the official procedure was followed, with a public survey and presentation to local authorities, the proposal was rejected by the authorities. A national park project submitted shortly afterwards met with the same fate. Meanwhile, the rapid installation of "polders" (land regained from the sea) in the Lower Mana marshes for intensive rice cultivation now makes protection of the wetland ecosystem impossible in a large part of this area. After so many unsuccessful projects, which were neither supported nor desired by the inhabitants of French Guiana, who are not yet sensitive to environmental issues, four years went by without any new proposals being presented.

The 1975 projects were reactivated between 1983 and 1985, with some slight modifications in limits and area, under the Biological Reserve Statute (Statut de Réserve Biologique Domaniales), new legislation arising out of an agreement between the Environment and Agriculture Ministries and the National Forestry Office, ONF. This more flexible legal formula generated hopes of rapid results.

Eight detailed reports, enhanced with scientific data, were submitted for the reserves situated in the north of the Department, which is the part most severely threatened by economic development, agriculture, timber exploitation, and road and airstrip construction:

- Lower Mana, reduced to only its forested sector, due to the conversion of the coastal zone to rice fields, now having an area of 27,200 ha instead of its original 48,400 ha.
The Kaw area was extended to include another part of the Kaw Mountain, where inventories revealed special richness and uniqueness; it was thus extended to 61,975 ha, instead of its original 46,800 ha. This project was presented in 1985 at the first SEPANGUY environmental congress (Granville 1986a, b).

Montagne Tortue lost almost half of its area to the Army with the installation of a training area, which reduced it from 3,800 to 2,200 ha.

Gabaret Creek, reduced on the east but extended on the west, now has an area of 20,800 ha.

The other four projects: Montagne des Singes, Cascades River, Paul Isnard, and Montagne des Trois Pitons, remained unchanged.

A ninth area was added to the proposal as a biological reserve to be managed on a communal level: Pararé Falls (16,700 ha) on the Arataye River, where the National Museum of Natural History of Paris and the National Center for Scientific Research (Centre National de la Recherche Scientifique, CNRS) have set up a research station. Ecosystem studies require an environment that is undisturbed and, above all, protected from hunting.

Perhaps the proposal for these biological reserve projects did not meet with the approval of those in charge at the time, for it was never submitted to the authorities in Metropolitan France. Since 1987, however, after so many attempts and failures, a few projects began to take shape.

**Recently protected areas and areas under study**

**The Kaw Plain Protected Habitat**

The Kaw Plain (La Plaine de Kaw) was the first to profit from a protection measure in the form of a Habitat Protection Decree (Arrêté de Protection de Biotope), which ensures the preservation of habitats necessary for the survival of endangered species. The document presented by Granville and Tostain (1989) was approved by the interested communities and the decree was signed in September 1989. The swampy areas extend to the estuary of the Approuague River on the east and there is a timber concession in the mountainous areas. Gabrielle Mountain on the west and Favard Mountain on the east fall within the perimeter of the protected area, which has an approximate total area of 76,800 ha: 60,400 ha of wetlands and 16,400 ha of mountainous areas. Logging and mining work, agriculture, and the opening up of new roads are prohibited. Other measures include a prohibition on helicopter landings and flights at altitudes lower than 100 mts over the Mare aux Caimans (Caiman Swamp), since this could cause the destruction of nests, eggs, and juveniles. The use of hydro-planes and hovercrafts is also forbidden in the entire swamp area and the power of outboard engines is restricted to 35-hp on the river south of the village of Kaw. The state of conservation of the flora is excellent in the area as a whole, and that of the fauna is satisfactory, except for the Kaw River area.
where the caimans have decreased in number due to hunting and the extension of the road. Current legislation ensures good habitat conservation but does not prohibit hunting. For a long time, this area has been accessible only by sea, but it is now receiving many more visitors with the opening of the road, and will receive even more when the bridge being constructed over the Mahury River replaces the barge presently used. Both the municipality and the inhabitants are demanding improved protection of their site and its resources, and the means of controlling the growing spontaneous tourism that is attracted by the beauty of the region. A study for a Regional Nature Park (Parc Naturel Régional) is already under way. This project, which can be expanded to include other coastal regions, will combine conservation measures with human activities such as tourism, lodging, education, or handicrafts.

The Grand Connétable Nature Reserve (proposed)

The small rocky islet of Grand Connétable (La Réserve Naturelle du Grand Connétable), situated 18 km from the coast, has long been known for its large seabird population and was once a site of guano exploitation. It was first proposed as a nature reserve by Condamin (1975). The birds that nest on this Island include the laughing gull (Larus atricilla; 1,100 to 1,600 pairs), the frigate bird (Fregata magnificens; 400 pairs), the royal tern (Sterna maxima; 600 pairs, 50% of the entire Caribbean stock), the Cayenne tern (Sterna eurygnatha; 2000 pairs), the brown noddy (Anous stolidus), and the sooty tern (Sterna fuscata). Inspections made at regular intervals by Tostain and Dujardin during the last ten years have shown not only the interest in having this territory protected but also the threat represented by the Venezuelan long-line fishermen, who use the fledglings as fishing bait. The document prepared by Tostain (1988a) has been adopted by the Regina-Kaw municipality, the General Council and the Regional Council. The rules prohibit landing and all human activity on the Island, except for persons undertaking studies of the bird populations; it also prohibits vessels from going too near to the Island, limiting the approach to 300 m from the coast for guided visits, one nautical mile (1,800 m) for small-scale fishing and 5,000 meters for commercial fishing.

The Shoals of Malmanoury Protected Habitat (proposed)

The shoals (Les battures de Malmanoury) consist of tiny rocky islets situated 2 or 3 km from the coast between Kourou and Sinnamary, isolated from their surroundings by a vast mudbank, the nesting-place for birds such as the laughing gull (150 to 200 pairs), the royal tern (90 to 600 pairs), the Cayenne tern (250 to 800 pairs), and a few pairs of herons (Egretta caerulea). They are also an important resting place for many migrating birds and particularly for thousands of North American shorebirds. It has been requested to declare the islets a protected habitat in order to regulate boat traffic and prohibit anchoring close to the islets or landing on them (Tostain, 1988b).
Map 3


Existing protected areas:
1. Lower Mana and Cawine marshes (Ramsar site)
2. Yiyi Creek (National Seashore Conserv. Agency)
3. Petit Saut Reservoir ("wildlife protection area")
4. Mt. Grand Matoury (Habitat Protection Decree)
5. Salines de Montjoly (Nat. Seashore Conserv. Ag.)
6. Maracas de Cayenne (Habitat Protection Decree)
7. Kaw plain (Habitat Protect. Decree, Ramsar site)
8. Grand Couronne Island (National Reserve)
9. Sãuí area (Habitat Protection Decree)

Proposed protected areas (declaration expected in 1995):
10. White-sands forest near Mana (Habitat Protection Decree)
11. Upper Voltaire River (Scenic Areas National Directory)
12. Trinité Mountains (National Reserve)
13. Les Nouragues (National Reserve)

- Southern limit for timber exploitation
- Southern area under control of access
Map 4

French Guiana: protected area proposals

Proposed protected areas:
1. Marshes and beaches near Mana (National Reserve)
2. Yiyi Creek drainage (National Reserve)
3. Malournemouth Inlets (Habitat Protection Decree)
4. Malournemouth area (Voluntary Wildlife Reserve, CSG)
5. Mt. Grand Matowy (National Reserve)
6. Salines de Montjoly (Habitat Protection Decree)
7. Kaw marshes and mountains (National Reserve)
8. Dekou-Dekou and Lucifer Mts. (Biological Reserve)
9. Southern National Park

Proposed zones for Southern National Park:
- Core area with wildlife protection
- Wildlife area with controlled mining
- Tribal use area
- Southern limit for timber exploitation
- Southern area under control of access
French Guiana. Photo 36: The Tumuc-Humac area includes large “inselbergs”, spectacular granite outcroppings with archaeological remains of nomadic indigenous tribes of the Stone Age. A common palm of the area is Astrocaryum sciophillum. Photo 37: The Roche Koutou is one of the inselbergs near the Marouini River and has been included in the proposal for a vast southern national park. Photo 38: The Sail area, protected under the Habitat Protection Decree, is extremely rich in biodiversity and endemism and includes a magnificent tall forest (here: a huge fig tree, Ficus gomelleira). Photo 39: The forests on white sand soils in the vicinity of Mana form part of a proposed Habitat Protection Area.

Photo 40: Expedition on the Waamakpann River in the Tumuc-Humac region, in southern French Guiana.
French Guiana. Photo 41: The nature reserve on the small rocky islet of Grand Connétable, 18 km off the coast, is the nesting place of many seabirds, including frigate birds, terns, and gulls. Landing and all human activity is prohibited on the island, except for authorized scientific studies. Photo 42: The marshes of the Kaw flood plain (that include the great "Caiman Swamp") and Kaw Mountain are preserved under the Habitat Protection Decree. Together with Grand Connétable Island, they have been included in the list of Wetlands of International Importance (Ramsar Site).
The Guianese Forest Park (proposed)

The park proposal (Parc de la Forêt Guyanaise) was presented in 1986 by J.M. Thiollet of the National Center for Scientific Research, funded by the Environment Ministry and with the scientific support of ORSTOM. To increase the possibilities of the project's success, the southern quarter of Guiana was selected. This is an uninhabited region, little used for hunting by Amerindians and bush-negroes, poor in minerals, far from the coast, and of little interest for timber exploitation, agriculture, or livestock-raising. There are no roads, the soils are chemically poor and few commercially valuable large trees are found. On the other hand, it is an appropriate region for the development of tourism oriented towards activities like hiking, canoeing or rafting the many rapids on the rivers. In addition, the spectacular granite outcrops that provide such magnificent overlooks are frequent in this region.

This Park would cover an area of approximately 1.7 million hectares, that is, less than one-fifth of the territory of the Department, and an extensive peripheral zone to be managed to receive tourists, who reach the communities of Maripasoula, Camopi, and Sall by air. This would be an important source of income for these communities. The principle of placing part of the forest under protection is presently being studied under the conservation law; agreements will also be made with the local authorities.

The Lower Mana River Regional Nature Park (proposed)

J. Freytet (1989) proposed a conservation and development program for the Lower Mana River area (Projet de la Basse Mana), with the creation of a nature reserve (réserve naturelle) for the wetlands and beaches east of the Mana River mouth, the home of many birds and the most important sea turtle spawning area, and a regional nature park (parc naturel régional) on the west. This project will be reactivated in a current study, which aims at the creation of a regional nature park.

Guiana Nature Center (proposed)

The project for the creation of the Guiana Nature Center (Centre Nature Guyane), was launched in 1989 by the commune of Sinnamary together with the General Council and covers a coastal area of 21,000 ha divided between the communes of Mana and Iraoubo. It provides for a lot of environment-related activities, involves many habitats, like mangrove swamps, wetlands, savannas and different types of forest, and would promote scientific research on these ecosystems. It could thus contribute to the economic and social development of the region by providing scientific information and environmental education to the population. It would include:

- An area for research on endangered species, in order to maintain specific diversity and limit poaching and illegal trading. The first operations would
include a study of scarlet ibis reproduction and a rescue of wildlife from the area of the Petit Saut hydroelectric dam, while it is being flooded.

- An ornithological park installed with the aid of the Conservatory of Coastal and Lake Areas of France (Conservatoire du Littoral et des Espaces Lacustres de France). This provision will have no real value except as a way of preserving a large strip of the mangrove swamp between Iracoubo and Sinnamary.

The Coastal Regional Nature Park (proposed)

In 1989, the Guiana Regional Council included the creation of a regional nature park (parc naturel régional) as part of its program. An association created for this purpose will carry out a study and prepare a proposal defining the boundaries of this park, its problems, and the actions to be taken. The communities of Régina-Kaw and Awala-Yalimapo, where the authorities are in favor of the project, provide grassroots support for this park. Other communes that will be included later include Roura, Mana and Iracoubo. In these areas that have no agriculture or industries, whose population struggles to obtain even meager resources, but which possesses a rich natural and cultural heritage, slowly a type of tourism is developing, that has no negative consequences for the inhabitants. The objective is to combat the de-vitalization of these rural communities and at the same time preserve a heritage that is exceptional in its richness and diversity. Indeed, this heritage may be the basis for activities that in themselves would provide the motivation and means for their management. The actions to be taken should:

- preserve the most fragile sites so as to maintain their ecological value;
- identify and investigate the ethnological and historical wealth of the coastal area and encourage reactivation of handicrafts, particularly basket-weaving and pottery making;
- develop conditions for offering visitors local products in such a way as to let them learn about and respect the region's natural and cultural heritage;
- aid in the development of a stable economy by re-evaluating the natural potential of the area and the strengths of the local communities;
- improve existing agricultural production in accordance to consumer standards and based on the conservation objectives of the area;
- increase the long-term value of the fishery through improved species management and fostering of the traditional processing of products; and
- prepare the people, particularly the children and adolescents, of these communities to develop within this new structure and thus guarantee them a higher quality life.

Guiana Space Center Voluntary Nature Reserve (proposed)

A colony of 2,000 pairs of scarlet ibises settled several years ago in the territory of the Guiana Space Center (CSG). A nesting zone in the mangrove swamp at the
mouth of the Karouabo Creek is presently the most important reproduction zone for the species. A petition has been made to create a voluntary nature reserve (reserve naturelle volontaire) through the CSG, so as to preserve this area, as well as a dry savanna area situated in the southern part of the same territory.

Interregional network of protected areas

The inventory of the Natural Zones of Ecological, Flora and Fauna Interest (Zones Naturelles d’Intérêt Ecologique, Floristique et Faunistique, ZNIEFF) was commenced in 1990; the documents produced will serve to identify the areas that should be protected on both a local and interregional basis, forming an interregional network (Réseau Interregional d’Espaces Protégés).

Conclusion

French Guiana lags considerably behind its neighbors in the matter of nature protection and the creation of parks and reserves. Its natural ecosystems, subject to very little disturbance until quite recent times, have not really required the adoption of urgent conservation measures. However, the rapid population growth in recent years, the development of roads and centers of considerable human activity, now make it more necessary to implement a coherent policy for the exploitation, management, and protection of the environment. The progress made in developing the population’s awareness of environmental issues, the decrees of May 15, 1986 regarding the protection of animal species, and the creation of the first protective legislation, all lead to the conclusion that the time has come to intensify efforts to protect the natural ecosystems. This policy should not meet with major obstacles, in view of the sparse population, and the restriction of potentially conflictive areas to the coastal plain. In other words, after the scant success of the various development programs for French Guiana based on classical approaches (agriculture, livestock, forestry exploitation, and industry), often more costly than profitable, the creation of parks and the development of a nature-oriented tourism would appear to be a more promising way of exploiting the natural environment. While preserving French Guiana’s rich biological heritage, this would enhance its value and at the same time provide a permanent source of income for the region and its inhabitants.

Editorial update: After so many years of unsuccessful projects for the creation of protected areas in French Guiana, the past three years have been promising for nature conservation activities in this French overseas department. Several of the long-standing proposals were reactivated and protected areas were established:

- The Grand Connétable Island Nature Reserve was declared in December 1992.
- The Grand Connétable Nature Reserve and the Kaw Plain Protected Habitat (Arrêté de
Protection de Biotope) have been included as one large area in the Ramsar list of protected wetlands.
- In April 1994, the area of La Mirande was declared a protected habitat.
- The brackish lagoons of Montjoly (Salines de Montjoly), situated a few kilometers east of Cayenne along the coast, were declared a "coastal conservation site" (Espace du Conservatoire du Littoral; National Seashore Conservation Agency) in 1994. A change of category to "protected habitat" has been proposed.
- Also in 1994, the surroundings of the Petit-Saut Reservoir have been declared a "game reserve", where all hunting is prohibited.
- In January 1995, an extensive area around Sail (65,000 ha) has been designated a "protected habitat" to preserve this area that has the highest species diversity in French Guiana and many endemic species. This legal status is intended to be only temporary, while awaiting approval of national park status.
- The hills ("Mornes") in the Cayenne urban area (Île de Cayenne) have been declared "habitat protection sites", including: Mont Grand Matoury (declared in April 1994), Monatibo, Mont Bourda, Mont Lucas, Mont Saint-Martin (all declared in January 1995), and Mont Mahury (to be declared very soon).

Apart from the recently established protected areas, several proposals exist, some of which await approval in the next few months:
- The creation of a nature reserve in Montagnes de la Trinité is progressing well and declaration of the area (70,000 ha) is expected in early 1995.
- The establishment of a nature reserve in the area of Les Nourages (Montagnes Balenfois) is also expected soon (early 1995). This reserve will cover 102,000 ha and include the scientific field station of Les Nourages.
- The Upper Voltaire River will soon be declared a "site classé" (scenic area).
- The project promoting an extensive national park in the south of French Guiana is progressing well. Its proposed three management zones consist of: core areas with wildlife protection, wildlife areas with controlled mining, and tribal use areas (see Map 4).
- In 1994, the proposal for a protected area in the Shoals of Malmanouy has been extended to include the mangroves and other coastal vegetation belonging to the Guiana Space Center between Kourou and Sinnamary. The status of "protected habitat" for the islets and "voluntary wildlife reserve" (réservé naturelle volontaire) for the coastal areas have been proposed.
- Nature reserve status has been proposed for the Kaw Plain, which is currently managed as a "protected habitat".
- The proposal for protection of the Lower Mana marshes, that originally aimed at the creation of a regional nature park, has recently been revised and divided into two different proposals: a nature reserve for the beaches of Awala-Yalimapo; and a "habitat protection area" for the white sand forests of Organabo.
- The proposal for a Guiana Nature Center has also been divided into two different projects: a "protected coastal area" (espace du conservatoire du littoral; 2,646 ha) in Yiyi Creek and a nature reserve (12,500 ha), including the upper watershed of Yiyi Creek.
The area of Dékou-Dékou and Lucifer Mountains, that includes a table mountain and is the habitat of several endemic species, has been proposed as a biological reserve (réserve biologique domaniale; 100,000 ha) to be managed by the National Forest Agency. Since 1990, no progress has been made concerning its protection status.

- Regarding the proposed Coastal Regional Nature Park, which would include several of the protected areas in the region of Mana, no progress has been made since 1989.

Several new developments have been identified that affect the declared or proposed protected areas:

- The Petit Saut Reservoir was flooded in 1994, and hydro-electric production will start in late 1995.

- In the Kaw Plains, the protected area and its caiman populations are affected due to increased influx of visitors to the area, after the opening of the bridge over the Mahoury river in 1992.

- Gold mining is increasing rapidly in French Guiana; extraction rose from 800 kg to 2,140 kg between 1990 and 1992. Australian and Canadian companies have developed extensive gold-mining projects (pers. comm. J.J. de Granville and O. Tostain, February 1995).
References


Guyana

Kaieteur National Park and its people

Denise Ferrier
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Abstract: Due to Guyana’s small population and vast territory, there has been relatively little pressure so far on the national natural resources. However, as the country embarks on an economic recovery program that includes greater exploitation of its natural resources, the potential for environmental degradation grows. At the present time, Kaieteur National Park (created in 1929; 57,498 ha) is the only legally established protected area in Guyana. The main users of the Park are the Amerindians, mostly members of the Patamona tribe. The Park has several problems, including the existence of an illegal mining settlement and the presence of livestock, causing serious damage to fragile ecological communities. Lack of financial resources has made it impossible to perform maintenance work on the Park’s infrastructure, or to design a management plan that would involve the indigenous inhabitants in the management.

Guyana is rich, both in species and in variety of ecosystems. The country also enjoys a cultural heritage that is impressive in its heterogeneity, ranging from the indigenous peoples (Amerindians) to that of the more recent arrivals from Europe, Africa, and Asia. Due to Guyana’s small population and vast land area, there has been relatively little pressure on the country’s natural resources. However, economic recovery and more large-scale exploitation of natural resources, particularly timber and minerals, cause greater potential for pressure on natural resources and degradation of the environment.

The government recognizes the importance of conservation. This has been demonstrated in a speech made by President Hugh Desmond Hoyte at the Commonwealth Heads of Government Meeting in 1989 where he offered 364,684 ha (900,000 acres) of the country’s forest land to be set aside for a project on sustainable tropical forestry and conservation of biological diversity. The legal documents required for the setting up of the project are presently being drafted. The project is to be run under Commonwealth auspices and its success will depend on involvement of the international community.

The Guyana Agency for Health Sciences Education, Environment and Food Policy (GAHEF) was established by the Government in June 1988. The Agency reports directly to the Prime Minister and has responsibility for environmental policy, plans, and programs as well as monitoring. The National Parks Commission (NPC) of Guyana, which is responsible for maintaining and managing the national parks, is an autonomous body which operates under the National Parks Commission.
Act of 1977, and is funded through GAHEF. Efforts are underway by GAHEF, in collaboration with the Ministry of Trade and Tourism and the NPC, to develop a management program for expansion of Kaieteur National Park, which to present is the only protected area in Guyana.

Demographical and ecological characteristics of Guyana

Guyana is located on the South American continent between 1° and 8.5° north latitude and 57° and 61.5° west longitude. It is bordered on the north by the Atlantic Ocean, on the east by Suriname, on the south and southwest by Brazil and the on west and northwest by Venezuela. The country has a total land area of 83,000 square miles (approximately 216,000 km²). At the end of December 1975, the estimated population was 780,000; of which almost 90% inhabit the coast. Population estimates by the Interamerican Development Bank (IDB) indicate a zero growth rate for the Guyanese population. This is due primarily to emigration of managerial and technically skilled persons during the last decade. This phenomenon has jeopardized the country’s economic development.

Guyana is the only English-speaking country in South America and its inhabitants belong to six racial groups. East Indians (people whose ancestors came from India) are the majority (approximately 57%), followed by Africans (38%). Chinese, Portuguese, Europeans, and Amerindians comprise the remainder. Through intermarriage there is a growing group of people of “mixed” race. The Amerindian Guyanese consist of nine tribes totaling approximately 35,000 people concentrated in 65 reservations, districts, and villages.

The economy of Guyana is mainly based on agriculture. The chief crops are rice and sugar cane. Also, a wide variety of green vegetables and root crops are produced. Fruits can also be found in abundance. The country’s main exports are rice, sugar, bauxite, gold, timber, and shrimp.

Guyana can be divided into four natural regions:
- The low coastal plain: which is four to six feet (1.2 m to 1.8 m) below sea level and protected from the tides by dykes (first built by the Dutch) along approximately 200 miles (320 km) of coastline.
- The hilly sand and clay belt: a wide stretch of rolling country covered mainly by dry evergreen and seasonal forests.
- The highland region: containing mountain ranges like the Pakaraimas and the Kaieteur Plateau. Montane rain and dry evergreen forests can be found here.
- The interior savannas: large stretches of savanna divided into the south and north savannas by the Kanuku Mountain Range. The southern savanna straddles the Brazilian border.

Guyana is a country with a variety of mineral resources, few of which are commercially exploited. The main ones are bauxite (and latrites), gold, diamonds, kaolin,
glass sand, and manganese. Other known minerals include: shell resources, copper, molybdenum, tungsten, iron, nickel, radioactive minerals, quartz, talc, oil, and gas.

The country's biological diversity is significant. A total of 1,228 terrestrial vertebrate species have been recorded so far: 788 birds, 198 mammals, 137 reptiles, and 105 species of amphibians (IUCN, 1987), of which 16 are endemic. Over 1,000 tree species are known and the highland region supports more than 8,000 species of flora, of which more than 50% are endemic. About 75% of Guyana's land area is covered by mostly pristine montane rain and dry evergreen forests. There is no information on the state of wildlife populations in Guyana. Surveys and inventories have not been done because of lack of funds and trained personnel. The country recognizes the importance of conservation of its biological diversity, but lacks the financial and human resources to promote such.

**Features of Kaieteur National Park**

Kaieteur National Park is located at approximately 5° latitude and 59° longitude. It straddles the ecotone of the sandy rolling lands and the Pakaraima Mountain region. The Pakaraima Escarpment has an average height of 650 m above sea level and is surrounded in places by "tepuis" (table mountains) which are considerably higher. The highest tepui is Mount Roraima which rises 2,690 m on Guyana's border with Venezuela and Brazil. The Pakaraima Mountains are also the source of many rivers which are renowned for their waterfalls.

The main feature of the Park is the spectacular Kaieteur Falls on the Potaro River which has a drop of 250 meters (five times the height of Niagara Falls). The steep river banks, just below the falls and the plateau adjacent to the falls, support unique plant associations which have evolved under the influence of the permanent cloud cover and cooler temperatures. Several plant taxa are endemic to the highland region around Kaieteur. Interesting plants in the area include rare species of orchids (approximately 20% of the 500 recorded species from the region are endemic). Also of interest are the bromeliads, which are said to be the tallest in the world.

A great variety of wildlife species can also be found in the Park. These include the Red-rumped Agouti (Dasyprocta agouti), Brazilian Tapir (Tapirus terrestris), Red Howler Monkey (Alouatta seniculus), Red Brocket Deer (Mazama americana), Collared Peccary (Tayassu tajacu), Jaguarundi (Felis yagouaroundi), the Guianan Cock-of-the-rock (Rupicola rupicola), and the Scarlet Macaw (Ara macao).

Access to Kaieteur is by air or via an arduous trail from a landing lower down the Potaro River. There are no regular flights to Kaieteur and chartered flights are expensive. For this reason, the number of persons visiting Kaieteur is very small. However, several tour operators offer one-day trips by plane to Kaieteur National Park in combination with a visit to Orinduik Falls on the border with Brazil. According to a recent report, "with appropriate infrastructure development Kaieteur will have good potential for eco- and scientific tourism as well as sightseeing."
Map 1

Guyana: geomorphological regions

- Limits of western savannas
- Escarpment
- Peaks
- Altitude in meters
- International boundary
- Mining
- International airport
- Coastal plain
- Mountainous region
- Pre-Cambrian terrace
- Plains of clay and white sand
Map 2

Guyana: protected areas

- Kaieteur National Park
- Kanuku Mountains National Park (proposed)
- Mt. Ayanganna National Park or Multiple-Use Reserve (proposed)
- Wokomung Mountain Scientific Reserve (proposed)
- Iwokrama Strict Scientific Reserve and Sustainable Resource Management Area (proposed)
- Mt. Roraima World Heritage Site (proposed)
The people of Kaieteur National Park

Besides the tourists and scientists who visit the Park, and the illegal miners from the coast, the only users of the Park are Amerindians. The proposed expansion of Kaieteur includes some Amerindian villages, namely, Chenapau, Velgrad, Karasparu, Kopinang, and Maikwak. Most of the people in these villages belong to the Patamona tribe. Little is known about their history and they are becoming increasingly accustomed to modern conveniences, such as outboard motors and even the occasional electric generator.

It is known, however, that the Amerindians believe in the presence of mountain spirits in certain localities. According to the writings of Walter Roth, this seems to have been due mainly to one or another of three sets of causes: peculiar shapes of the rocks; the supposed transformation of a person or animal into stone; or the association of the locality with some remarkable event that took place long ago. There seems to be an endless number of spirits connected with mountains, precipices, rocks, cataracts, etc. The legend of Kaieteur is also associated with such beliefs: the falls derive their name from that of an old Indian, Kaic, believed to have been sent to death there (Roth, 1915).

Chenapau is the only settlement in the centre of the Park. It is roughly 25 km upstream from Kaieteur Falls. Its inhabitants belong to the Patamona tribe, which is of Carib origin. A Catholic mission was established in 1966 and the village has a school with two teachers and a health station with access to modern medicine. The "doctor" is a young Amerindian medical officer trained by GAHEF. The traditional lifestyle, with hunting, fishing, gathering, and subsistence agriculture, prevails in the village. It is, however, also the center of mining activities (diamond mining in particular) by both Amerindians and non-Amerindians. There are no official Amerindian reservations in the area, so miners that have migrated from other regions, work and move freely in the local Amerindian settlements.

Status of the park

Guyana's protected area was legally established by the Kaieteur National Park Act of 1929 (amended in 1973), setting aside 1,055 ha of land for the Park. In 1989, the Cabinet approved an extension of the Park's boundaries to coincide entirely with the boundaries of the People's Cooperative Unit No. 812,121, within which the original Park was wholly lying. The new area of the Park is 222 square miles (57,498 ha). To date, the boundaries of Kaieteur National Park have not been demarcated on the ground and the sole employee is in charge of the visitor facilities, which are in bad repair. Due to lack of financial resources no infrastructure maintenance has been carried out and no management plan has been drafted.
The integrity of the Park is threatened by the existence of an illegal mining settlement just above the falls called Menzie’s Landing. Besides actual physical damage caused by mining activities, excessive use of mercury by gold miners may soon pose a serious health hazard if not properly controlled. Another problem affecting the Park is the illegal grazing of cattle on the plateau, which is causing serious damage to the fragile plant communities inside the Park, adjacent to the falls. Additionally, some of the tourists who visit the area leave behind garbage (mainly tin cans) strewn on the ground near the falls, particularly by the airstrip.

In 1990, a proposal was submitted to the World Wildlife Fund by GAHEF in collaboration with the National Parks Commission requesting assistance for expansion and development of Kaieteur National Park. In response to GAHEF’s proposal, WWF-US provided a consultant who prepared a diagnostic report after a ten-day visit to Guyana and the project site in March 1991, including recommendations on measures to be taken. This report was approved in principle by the Government of Guyana, and it is envisaged that with further assistance from WWF-US a multidisciplinary team would begin work on a management plan for the Park.

It has been proposed that the Park’s boundaries be expanded to cover approximately 400,000 ha, following recognizable natural boundaries to avoid costly surveys, demarcation, and maintenance. The proposed boundaries were chosen in an attempt to maintain the ecological integrity of all major habitats in the expansion area. Attempts were also made to include the entire watersheds of creeks draining into the savannas to the southwest and south of the mountain chain near the Potaro Plateau. The expansion would encompass large tracts of undisturbed forest with small savanna and wetland sections in the Potaro Plateau. The proposal also includes two new protected areas for Guyana (National Forestry Action Plan, 1988):
- Mt. Ayanganna National Park or Multiple Use Reserve would include Guyana’s second highest peak (2,042 m). The area receives the highest precipitation in the country.
- Wokomung Mountain Scientific Reserve, which is not quite as high as Mt. Ayanganna (1,829 m), but includes another similarly spectacular conical peak.

The proposal suggests, that the three areas should be consolidated and managed as one entity. It is believed that the Amerindians who use the Park would ultimately benefit from its expansion. They should participate in, and contribute to, the Park’s management programs (possibly also as park wardens), as long as mining activities are controlled.

Conclusion

Kaieteur National Park supports a rich diversity of flora and fauna. Fortunately, the lack of tourism infrastructure has resulted in few visitors to the Park and therefore tourist-impacts on the area have also been few. The effects of lack of enforcement within the Park are evident in the amount of trash strewn near the airstrip, the
presence of an illegal settlement, and cattle-grazing on the plateau. The development of a management plan will hopefully address these problems. The National Park is important to the traditional lifestyle of the indigenous people of the region and the establishment of a management plan that involves them could be to their economic benefit. By and large, the future of Kaieteur National Park and its people depends on the formulation of an appropriate management plan and the availability of financial and human resources to implement it.

Editorial update: The Government of Guyana is committed to ensuring the integrity of forest systems, the conservation of areas with high species diversity, and the preservation of the country’s historical and cultural heritage. However, the establishment of a functioning system of protected areas is hampered by the lack of funds, qualified people, and effective institutions. The National Parks Commission Act of 1977 gives management authority to the National Parks Commission (NPC), which unfortunately is more oriented toward urban recreational parks. Kaieteur is still the only national park in Guyana, and still has no infrastructure, extremely low funding, and only one park ranger. With no land-use planning in Guyana, the Park is not demarcated on the ground, and is still much too small for sustainable management of its biological diversity and endemism.

The President’s offer in 1989, to set aside almost 400,000 ha of rainforest, has resulted in an international project under UNDP responsibility, initiated by the Commonwealth States. This “Iwokrama Rainforest Program” received US$ 3 million from the Global Environment Facility (GEF) as a “start-up funding”. It proposes to declare half of the land a protected area (category yet to be defined, probably “strict scientific reserve”), and the remaining part to be used for experimentation in sustainable resource management, with an “International Centre for Research and Training”. The project administration is housed together with the Guyana Natural Resources Agency (GNRA) in the capital of Georgetown, approximately 250 km to the north of the project site. The Iwokrama mountain range (600-1000 m above sea level) in central Guyana forms the heart of the project area, which is almost entirely bounded by rivers (the Essequibo, the Siparuni, the Takutu, and the Sipariparu). The only semi-permanent habitation consists of an Amerindian settlement of 50 people at Kurupukari, although other Amerindians traditionally hunt and fish in the area. Scattered deposits of gold and diamonds have been exploited by small-scale enterprises. Funding for the first stage of the project (1992-94) was obtained (in addition to the GEF/UNDP donation) from the Commonwealth Secretariat and its Fund for Technical Cooperation, as well as from Britain’s Overseas Development Administration, which pays specifically for surveys of the site (Natural Resources Institute 1992).

The Protected Areas Project in the National Environmental Action Plan (NEAP, presented by the Guyanan Government in 1994) was given high priority and pledges of funding at an international round table in February, 1993. The European Economic Community (EEC), the government of Germany, and the Worldwide Fund for Nature (WWF) have agreed to help design a System of National Parks and Protected Areas for Guyana, which will incorporate ongoing work to identify places of special natural, scientific, historical, and cultural interest.
Guyana. Photo 43: Guianan Saki Monkeys (Pithecia pithecia) prefer tall, primary forest habitat. They travel by springing leaps, sometimes hopping bipedally without using their hands, and are locally known as "flying monkeys". Photo 44: Manatees or "sea cows" (Trichechus manatus) live entirely under the water; only their nostrils break the surface when they rise to breathe. These huge mammals (up to 4.5 m long, weighing 600 kg), have been ruthlessly hunted almost to extinction for their meat, oil, and hides. In Guyana, these gentle herbivores that browse exclusively on aquatic vegetation have been introduced with great success in channels near the coast to open up weed-congested sections.
Guyana. Photo 45: The spectacular Kaieteur Falls form the heart of the only legally established protected area in Guyana, Kaieteur National Park. The falls are surrounded by mostly undisturbed dense rainforests, the home to Amerindians of the Patamona tribe. Photo 46: The government of Guyana recognizes the importance of nature conservation and seeks to establish international links for support of its diverse conservation plans.
The NEAP calls for the protection of Kaieteur and 14 other natural areas, including a biosphere reserve in the southwest (for which a bill has already been drafted) and a proposed world heritage site at Mt. Roraima. Conservation International completed a rapid assessment of the Kanuku Mountains and the EEC financed a study for the creation of a protected area in the Kanuku Mountains and adjoining savanna areas of the Rupununi region. Consultation with Amerindian communities in these areas will be going on as their involvement and agreement will be critical to the success of these protected zones. The Government is currently reviewing the preliminary and coincident conclusions of both studies, recommending that the Kanuku Mountains should be developed as a second national park. Effective management of the two national parks will require international technical assistance, as well as funding (Government of Guyana 1994, and pers. com. Dres. M. Fischer and M. Schönvoigt, Luso-Consult, March 1995).
References


Paraguay

Protected areas

Celeste Acevedo
Jorge Pinazzo

Cerro Corá National Park:
environmental education among the Park’s neighbors

Ludislao Carmelo Rodriguez
Celeste Acevedo
Abstract: Protected areas in Paraguay presently consist of a set of units with weak
connections and goals, due to the lack of a national environmental conservation policy. The
system is composed of ten protected area categories under three types of ownership: state or
public ownership (1,175,398 ha; administered by the Forestry, National Parks, and Wildlife
Management Department; includes the categories of national park, protection forest,
national reserve, and scientific monument), private ownership (18,444 ha; individuals,
cooperatives, and foundations managing the categories of protection forest, biological
reserve, recreational park, and private nature reserve), and other types of ownership (87,008
ha; power companies, or established via international conventions, including the categories
of biological reserve, biological refuge, and wildlife refuge). All these areas together cover
approximately 3.1% of Paraguayan territory.

The term ‘national park’ first appeared in Paraguayan legislation in 1963 in the
Agrarian Law 854 (Ley 854 del Estatuto Agrario), which designated “portions of
land reserved for national parks”. Three years later, in 1966, the first national park
was declared: Tinfunqué, with an area of 280,000 ha. At that time, there was no
government agency dedicated exclusively to the administration of protected areas.

The first national legislation for natural resource protection was the 1973
Forestry Law (Ley Forestal) No. 422, which declared the protection and conser-
vation of forest resources to be of public interest. This Forestry Law provides for
the creation of the National Forestry Service (Servicio Forestal Nacional, SFN)
within the Ministry of Agriculture and Livestock (Ministerio de Agricultura y
Ganadería). In 1975, the Forestry, National Parks, and Wildlife Management
Department (Departamento de Manejo de Bosques, Parques Nacionales y Vida
Silvestre) was created and in the following years a total of seven national parks were
declared under executive decree at the request of the Ministry of Agriculture and
Livestock. In 1987, the National Parks and Wildlife Office (Dirección de Parques
Nacionales y Vida Silvestre), specifically responsible for protected area manage-
ment, was formed and under its administration two protected areas were created and
two others were enlarged.

Due to the lack of adequate legislation regarding their definition, the protected
areas developed partly as copies of their counterparts in neighboring countries and
partly as a response to the social, political, and economic circumstances of the time.
Protected areas in Paraguay presently consist of a number of individual units with weak connections and unclear goals, due to the lack of a national environmental conservation policy. Therefore, the National Parks and Wildlife Office is presently preparing a proposal for legislation on protected areas.

A point to be noted is that in both urban and rural areas, there are tracts of land set aside for recreational purposes, or sites with historical features, which are designated national parks although their size or state of conservation do not justify this. Two examples of these are Ñu Guazú National Park, a recreational and sports park some 10 ha in size situated in the suburban radius of Asunción, the Paraguayan capital; and Bernardino Caballero National Park, 120 km from the capital, with an area of 3 ha, which preserves sites of historical interest. This faulty concept of national parks is due in part to the lack in the past of an official agency for the regulation of protected areas.

Special mention should be made of the lands owned or settled by indigenous communities, which in Paraguay are not presently regarded as protected areas. The total area occupied by indigenous groups is around 63,323 ha in the eastern region and 230,305 ha in the western or Chaco region (INDI, 1982). Most indigenous communities, particularly those of the eastern region, use their lands for small-scale agriculture and livestock-grazing, or to carry out extractive activities like the exploitation of palmetto palms and valuable timbers. Many of these communities are assisted by religious and social missions who organize them in agricultural settlements, although there are still some cases where the indigenous groups continue their traditional lifestyle of hunting, fishing, and gathering, taking special care to not severely alter their surroundings.

Protected area management categories

The organization of a national protected area system in Paraguay is still in its initial stages. This system is composed of protected areas divided into three administrative groups based on proposed land tenure: State-owned, privately-owned, and other forms of land tenure.

State or public ownership categories

From a legal standpoint, Forestry Law 422/73 considers only one protection category, that of national park, but in practice there are presently four management categories: national parks, protective forests, national reserves, and scientific monuments. These four management categories together occupy 1,175,398 ha and are administered by the National Parks and Wildlife Office.

The following are the principal features of each category, based on their state of conservation, their use, and their present dimensions. It should be emphasized,
however, that current legislation does not define these categories, and therefore the following information is based solely on the authors' own experience and knowledge.

- **National Park (Parque Nacional).** Paraguay has eight national parks with a total area of 1,183,038 ha. The minimum size of a national park is 5,000 ha, and its purpose is to protect ecosystems and landscapes still in a pristine state. Legally speaking, no productive or extractive activities, or rural settlements, are permitted in such areas, nevertheless, they are present in some parks. Part of the park lands are state-owned and part are privately-owned. Endeavors are being made to carry out environmental education and extension in all the areas.

- **Protective Forest (Bosque Protector).** These have an area of at least 1,000 ha, and extraction, production, and human settlements are prohibited within them. In general, there has been no environmental education or extension. Paraguay has two protective forests, covering an area of 2,000 ha, both on privately-owned lands. The sample they protect is a small remnant of the primary forest ecosystem of eastern Paraguay. They include beautiful rivers and waterfalls, but do not cover entire watersheds or even micro-watersheds. In the immediately adjacent area agricultural production of monocultures is carried out on tracts of land up to 10 times larger than that of the protective forest itself.

- **National Reserve (Reserva Nacional).** This category protects samples of rare or endangered species. Paraguay's single national reserve is also situated on privately-owned land and has an area of 60 ha, although the decree provided for an original area of 2,000 ha. It protects a conifer species called the Paraná-pine (*Araucaria angustifolia*). However, due to the area's reduced size and present conditions (extraction, production, and settlement are occurring in the surrounding areas) this does not seem to be an ecologically viable sample.

- **Scientific Monument (Monumento Cientifico).** Paraguay has one scientific monument of 300 ha, located in the Alto Paraná region, which protects the remains of the cultural activity of the naturalist Moisés Bertoni. Ecosystems have been modified and non-native species introduced into the area.

**Private ownership categories**

From a legal perspective, there are no special requirements for inclusion in any of the remaining categories. They are administered by private agencies, such as non-governmental organizations like the Moisés Bertoni Foundation (FMB), with its Private Nature Reserve Program (Programa de Reservas Naturales Privadas), or cooperatives like the "Cooperativas Mennonitas del Chaco Central" (CMCC), with their Forestry Reserve Network (Red de Reservas Forestales). Privately managed areas occupy a total area of approximately 18,444 ha.

The Forestry Reserve Network of CMCC is managing its 8,744 ha in the following categories: protective forests (bosques protectores, 5 ha - 2,500 ha); biological reserves (reservas biológicas, 5 ha - 300 ha); and recreational parks (parques
Map 1

Paraguay: protected areas (1992)

- National park
- Other protected area
Paraguay. Photo 47: Cerro Corá National Park is the only protected area in the country with an extensive environmental education program, including many hands-on activities for the rural settlers and their children. Photo 48: Ybytyruzú National Park contains important natural and historical features. Due to the presence of many settlers and private properties, a change of management category ("managed resources reserve") has been proposed for Ybytyruzú.
Paraguay. Photo 49: The traditional gathering of firewood is among the minor threats to protected areas. Photo 50: Defensores del Chaco is the oldest and largest national park (780,000 ha) in Paraguay. Provision of opportunities for research and environmental training are important tasks of this category of protected area.
Table 1

Paraguay: protected areas (1992)

<table>
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<th>Area in ha</th>
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### NATIONAL PARKS

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</tr>
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<td>3</td>
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<td>4</td>
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### NATIONAL RESERVES

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### PROTECTIVE FORESTS

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### BIOLOGICAL RESERVES

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### FORESTRY NATURE RESERVES

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regionales de recreación, < 5 ha). The Private Nature Reserve Program of the FMB was created in response to private owners who were voluntarily setting aside parts of their estates as protected areas, with hunting prohibition, maintenance of undisturbed ecosystems, reforestation projects, and the application of rational management practices. The program now includes a total of 9,700 ha in four private reserves.

Other types of land tenure

This group includes protected areas administered by companies or entities, in charge of the administration of binational hydroelectric dams. It also includes areas created by international agreements. Mbaracayú Forest Nature Reserve (reserva natural del bosque) was created through an agreement between the Paraguayan government, the United Nations, The Nature Conservancy, and the Moisés Bertoni Foundation of Paraguay. The agreement calls for the conservation and sustainable management of the natural resources in an area of 57,715 ha in northeastern Paraguay. The agreement also aims to transform this nature reserve into a biosphere reserve.

The other protected areas indicated below form part of the environmental conservation program of the hydroelectric dam administration companies. There are two great binational hydroelectric dams in Paraguay, shared with Brazil: Itaipú, already in operation and administered by the company “Itaipú Binacional”; and Yacyretá, under construction and administered by “Entidad Binacional Yacyretá”.

“Itaipú Binacional” is managing a total of 29,193 ha divided into: biological reserves (reservas biológicas), where scientific research is carried out in extensive areas with little alteration of the natural conditions; and biological refuges (refugios biológicos), which consist of smaller areas that have been greatly altered by human activities. The company is carrying out soil and vegetation recovery work in the biological refuges (Pérez / Huerta, 1987).

“Entidad Binacional Yacyretá” has established a wildlife refuge (refugio faunístico) of 100 ha, whose main objectives are the study of the feeding habits and rehabilitation of wildlife, as well as environmental education in neighboring settlements.

The distribution of the Paraguayan population and the protected areas

Paraguay is a land-locked country with an area of 406,752 km² and an estimated 1992 population of 4,519,327 (DGEC, 1990). It is divided into two great natural regions, each with unique ecological features, that have determined the settlement of human populations throughout the country’s history. The sparsely populated western Chaco region represents 60% of the country, but contains only 3% of the
population (around 0.3 inhabitants per km² according to official projections for 1992; STP, 1990). It possesses the largest protected areas in the country. The region's three national parks alone — Defensores del Chaco, Teniente Enciso, and Tinfunqué — make up almost 90% of the land in Paraguayan protected areas.

Although the number of protected areas in the eastern region is larger than that of Chaco (5 national parks, 2 biological reserves, 2 biological refuges, and four additional areas in lower conservation categories), the total area under protection is much smaller. This eastern region, which represents 40% of the country's area, contains 97% of the population, with a density of 27.9 inhabitants per km². All the national parks are located near population centers, including departamental capitals.

The future of protected areas in Paraguay

There is a current trend toward integrating protected areas with the local communities as a means of ensuring their long-term survival. The support and recognition of the human population living in the vicinity of protected areas are fundamental in reducing the risks of degradation and alteration of the ecosystems due to hunting or extractive activities.

Paraguay's biggest success with environmental education is probably that of Cerro Corá National Park. An Association of Environmental Protection Volunteers bearing the park's name was created, which operates as a non-governmental organization, 500 km from the capital. In a country of almost 4,500,000 inhabitants, where all activities tend to be centralized in the capital, it is extremely unusual for a non-governmental organization to operate in a completely decentralized manner, with its actions entirely oriented towards providing solutions to the local problems that affect a community and, therefore, the neighboring park. Local support groups are very important in this relationship and should be appropriately financed so as to improve the levels of involvement, communication, and respect between the community and the park.

Note: In the Spanish version of the book, a detailed description is given on the situation of the following national parks: Defensores del Chaco, Teniente Enciso, Tinfunqué, Cerro Corá, Ybycuí, Caaguazú, Ybytyrusú, and Ypacarai. Due to extensive modifications in the protected area system of Paraguay during the past three years, the editors chose to include instead a new table and map of the existing and proposed protected areas.

Editorial update: On June 21st, 1994 the Paraguayan Congress ratified Law No. 352 on protected areas (Ley de Areas Silvestres Protegidas), thereby establishing the rules and regulations for all activities carried out in the areas of the newly created National System of Protected Areas in Paraguay (Sistema Nacional de Areas Silvestres Protegidas, SINASIP).
Map 2

Paraguay: SINASIP protected areas (1994)

- National park
- Natural monument
- Other protected area
- National park (proposed)
- Natural monument (proposed)
- Other protected area (proposed)
### Table 2

Paraguay: SINASIP protected areas managed by the National Park Administration (1994)

<table>
<thead>
<tr>
<th>No. on Conservation Units</th>
<th>Location (Department)</th>
<th>Area in ha</th>
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<tr>
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<td>1980</td>
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<td>Amambay</td>
<td>12,038</td>
<td>1976</td>
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<td>4 Lago Ypúa</td>
<td>Central, Neembucu, Paraguari</td>
<td>100,000</td>
<td>1992</td>
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<td>5 San Rafael</td>
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<td>6 Médanos del Chaco</td>
<td>Nueva Asunción</td>
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</tr>
<tr>
<td><strong>WILDLIFE REFUGES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 Yabebyry</td>
<td>Misiones</td>
<td>30,000</td>
<td>1993</td>
</tr>
<tr>
<td><strong>SCIENTIFIC RESERVES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Cerro Chovoreca</td>
<td>Chaco</td>
<td>13,000</td>
<td>proposed</td>
</tr>
<tr>
<td>20 Pirizal</td>
<td>Boquerón</td>
<td>150,000</td>
<td>proposed</td>
</tr>
<tr>
<td>21 Estrella</td>
<td>Concepción</td>
<td>50,000</td>
<td>proposed</td>
</tr>
<tr>
<td><strong>ECOLOGICAL RESERVES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 Pozo Hondo</td>
<td>Boquerón</td>
<td>150,000</td>
<td>proposed</td>
</tr>
<tr>
<td>23 Ríocho Yacaré</td>
<td>Presidente Hayes</td>
<td>200,000</td>
<td>proposed</td>
</tr>
<tr>
<td>24 Laguna Blanca</td>
<td>San Pedro</td>
<td>30,000</td>
<td>proposed</td>
</tr>
<tr>
<td>25 Acaray mi</td>
<td>Caaguazu, Alto Parand</td>
<td>25,000</td>
<td>proposed</td>
</tr>
</tbody>
</table>
During the design of SINASIP, the existing 17 protected areas were reviewed (nine of which were included in SINASIP), new categories were proposed for some areas, and the creation of 16 additional areas was recommended. In the eastern region of the country, these new areas would consist of: Cerro Sarambí and Estero Milagro National Parks; Bosque Arary Natural Monument; Laguna Blanca and Acaray Mi Ecological Reserves; and Estrella Scientific Reserve. The western region of Paraguay would additionally count with Cerro Guarani-Timane, Médanos del Chaco, Laguna Inmákatu, Río Negro, Tacuara, and Laguna Guaso National Parks; Riacho Yacaré and Pozo Hondo Ecological Reserves; and Cerro Chovoreca and Pirizal Scientific Reserves. These new declarations would elevate the number of Paraguayan national parks to 13. All of the 16 areas, that have been proposed for addition to SINASIP, cover large areas of private lands. Due to their ecological importance, the SINASIP document (DPNVS, 1993) proposes the purchase of these lands (more than 2,200,000 ha). In order to know more about the land tenure situation of the potential protected areas, a team of technicians should investigate and document the status quo in maps, which would facilitate the work of a second team, responsible for the subsequent negotiations with private landowners. According to estimates, these procedures would take approximately three years and require US$ 665,600 (apart from the indemnizations for the landowners). Another project proposed for the near future is the creation of an information system on the ecological resources and values of the existing and proposed protected areas. This project is estimated to require 8 months of work and approximately US$ 60,000. The third and last project proposed in the SINASIP document is aimed at capacity building of the National Parks Administration ( Dirección de Parques Nacionales y Vida Silvestre, DPNVS), including the hiring and training of 10 new professionals. The amount required during the three-year-project is estimated at US$ 672,900 (DPNVS, 1993 and pers. com. C. Acevedo and J. Pinazzo, February 1995).
Abstract: Cerro Corá National Park lies in the northwest of Paraguay, near the Brazilian border. It is the only protected area in the country with an extensive environmental education program, which was set up in 1988 in the Park's zone of influence. The program consists of classroom and hands-on activities for school children (aged 7 to 12), their teachers, their parents, and other local residents. The activities and methods are periodically evaluated jointly by the elementary school teachers and the National Park's technicians and park rangers during three- or four-day meetings held twice a year in the Park itself. The program now reaches a total of 1,000 people, in an area of 30,000 ha in the entire perimeter of the Park. The presence of the Park and its environmental education program prompted the creation of the Cerro Corá Environmental Volunteers Association, whose objectives include developing knowledge, understanding, and appreciation of Nature.

Cerro Corá National Park, which was declared in 1976, has an area of 12,038 ha. It is situated in Amambay Province, 32 km from the Brazilian border, and some 500 km southwest of Asunción (the Paraguayan capital), with altitudes ranging from 250 to 470 m above sea level (22° S lat. and 56° W long.). The many natural communities represented in the Park include high forest, low dense forest, prairies with trees, low prairies, isolated hills, and ravines (CDC, 1989). These natural communities belong to the biogeographical province of the Brazilian rainforest (Udvardy, 1975). Endangered flora and fauna protected by the Park include anaconda (Eunectes murinus), jaguarundi (Felis yagouaroundi), clover (Amburana cearensis), and peroba (Aspidosperma polyneuron). In addition, Cerro Corá National Park has sites of archaeological and cultural interest, including petroglyphs and battle fields from the War of Paraguay against the Triple Alliance formed by Argentina, Brazil, and Uruguay (1865-1870).

Cerro Corá National Park is located in a region of rapidly changing landscapes. Amambay Province has an annual deforestation rate of 16,051 ha (Kohler, 1989), stimulated by the proximity of Brazil. The protected area is surrounded by a total of five peasant settlements with an estimated population of 10,000 people, whose main source of income is the use of the diminishing natural resources of the area: timber extraction, agriculture, and livestock-grazing.
Administration of the area of historical interest within the Park is shared between the Ministry of Agriculture and Livestock (Ministerio de Agricultura y Ganadería: National Parks Administration) and the Ministry of National Defense in the historical zone (Ministerio de Defensa Nacional: Technical Administration). The personnel consists of six civilians (one technician and five non-specialized persons) and four soldiers. The objectives and activities of Cerro Cora National Park can be summarized as follows:

- management and preservation of the Park’s natural, archaeological, and historical resources;
- environmental education;
- development of research in the Park, with technical and logistic support to researchers.

Environmental education program

The Environmental Education Program (Programa de Educación Ambiental, PEA) in the area of influence of Cerro Cora National Park was set up in October 1987, after the Park’s tenth anniversary. It is based on the need to create ties and develop environmental consciousness in the surrounding population, and to fight the external pressures on the Park’s natural resources by offering alternatives for use of their already altered land.

From its very beginning, the PEA has received constant financial and logistic support from various national and international, private and governmental, organizations. The international organizations include the U.S. Peace Corps, World Wildlife Fund, Fish and Wildlife Service, and Amigos del Paraguay (Association of ex-Peace Corps Volunteers in Paraguay). National organizations that have supported the PEA are the Moisés Bertoni Foundation, the National Natural History Museum, the Pedro Juan Caballero Environmental Protection Association, and the Ministry of Education (Ministerio de Educación y Culto).

The main objective of the PEA, which covers an area of 30,000 ha around the Park, is to enable the population to acquire the necessary environmental consciousness to be both protectors and users of the Park. It is also aimed at providing the inhabitants with the technical knowledge needed for the rational and sustainable use of natural resources. An important factor in the success of the program is language. Paraguay is a bilingual country and the program must necessarily be issued 70% in Guarani (the dominant language throughout the country) and 30% in Spanish.

The program was first directed toward elementary school teachers and pupils because the program would thus reach all the local homes, and because in the future the children of today will be responsible for decision-making in their community. The second basic component is the natural creativity and experience of teachers,
students, and farmers, making use of the elements they find around them, as well as their own knowledge. The third component, acting chiefly as a reinforcement factor, is the giving of talks to the farmers, the majority of whom are the students' parents.

These talks deal with tangible problems they can easily understand, rather than theoretical concepts. Based on these three components, the PEA holds three seminars a year and provides technical information during the rest of the time.

The environmental education program for teachers and students

Programs that are 50% practical and 50% theoretical are prepared using the surrounding elements and the creativity of the local elementary school teachers and students, to include the following subjects:
- definition and classification of natural resources;
- problems affecting the conservation of the area’s natural resources, for example deforestation;
- the relationship between products in daily use and their origin in natural resources;
- possible solutions (within the teachers' scope), to alleviate the problems;
Table 1

Paraguay: schools participating in the environmental education program

<table>
<thead>
<tr>
<th>Name of School</th>
<th>No. of Students</th>
<th>Successes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiriguélo</td>
<td>120</td>
<td>Plant nursery in operation (with deficiencies)</td>
</tr>
<tr>
<td>Lorito Picado</td>
<td>80</td>
<td>School 100% planted with trees; introduction of vegetables</td>
</tr>
<tr>
<td>Puente Nande Yara</td>
<td>22</td>
<td>Plant nursery in operation (with deficiencies)</td>
</tr>
<tr>
<td>Naranja Jahai I</td>
<td>20</td>
<td>Introduction of vegetables</td>
</tr>
<tr>
<td>Guavirí</td>
<td>110</td>
<td>(Activities limited by unsuitable natural conditions)</td>
</tr>
<tr>
<td>Pipuy Gasory</td>
<td>60</td>
<td>School 100% planted with trees; introduction of vegetables</td>
</tr>
<tr>
<td>Yatayí</td>
<td>50</td>
<td>School 100% planted with trees; introduction of vegetables</td>
</tr>
<tr>
<td>Colonia Sereno</td>
<td>30</td>
<td>Plant nursery in operation, introduction of vegetables</td>
</tr>
<tr>
<td>Accite-I</td>
<td>20</td>
<td>(Activities limited by unsuitable natural conditions)</td>
</tr>
<tr>
<td>Naranja Jahai II</td>
<td>10</td>
<td>School 100% planted with trees; introduction of vegetables</td>
</tr>
<tr>
<td>Capiibary</td>
<td>100</td>
<td>Plant nursery in operation (with deficiencies)</td>
</tr>
<tr>
<td>Primero de Mayo</td>
<td>25</td>
<td>(Program impeded by bad roads)</td>
</tr>
<tr>
<td>Victoria Guazú</td>
<td>25</td>
<td>(Activities limited by unsuitable natural conditions)</td>
</tr>
<tr>
<td>Vista Alegre</td>
<td>25</td>
<td>(Program impeded by bad roads)</td>
</tr>
</tbody>
</table>

- indications for the inclusion of environmental themes into the teaching of other subjects in the educational curriculum;
- establishment of plant nurseries, both in the schools and the Park, with seeds from mother plants located in the Park.

The idea is that the teacher be a guide for the child’s natural intuition, and that there be a flow of innate knowledge from teacher to child and vice-versa. The aim is to encourage a dynamic type of teaching that uses the creativity of both teacher and child in relation to the area’s natural components. A good example of a hands-on activity is the teaching of the importance of a protected area as a seed bank. The plant nurseries are prepared within the Park with seeds collected by the students from the mother plants of the area. The seedlings are planted at the school and in the Park itself. As a tangent to this activity, some students also enjoyed growing vegetables, which they prepared and ate at lunch time. An example of a classroom activity is the use of the area’s natural resources to teach mathematics. Instead of using toothpicks for arithmetical calculations, it is possible to use the little trees growing in the plant nursery (or the seeds). In the higher grades, calculation can be made of the percentage of success in the germination of seeds, and in the lower grades, trees can be counted by species.

To reinforce what the teachers trained in PEA have transmitted to their pupils, the park technicians periodically visit the school plant nurseries, giving the necessary advice and technical assistance, as well as basic talks to the students.
Cerro Corá National Park: environmental education among the Park's neighbors

Table 2

<table>
<thead>
<tr>
<th>Name of Settlement</th>
<th>Total No. of Families</th>
<th>Families taking part</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorito Picado</td>
<td>60</td>
<td>4</td>
<td>Soil conservation; agroforestry planting; live fences</td>
</tr>
<tr>
<td>Picuy Gasory</td>
<td>10</td>
<td>2</td>
<td>Soil conservation; agroforestry planting</td>
</tr>
<tr>
<td>Yataity</td>
<td>10</td>
<td>2</td>
<td>Forestry planting</td>
</tr>
<tr>
<td>Colonia Sereno</td>
<td>10</td>
<td>0</td>
<td>(no information)</td>
</tr>
<tr>
<td>Aceite-i</td>
<td>4</td>
<td>3</td>
<td>Soil conservation; live fences</td>
</tr>
<tr>
<td>Naranja Jahai</td>
<td>30</td>
<td>3</td>
<td>Soil conservation; agroforestry planting; live fences</td>
</tr>
</tbody>
</table>

The environmental education program for local farmers

For the farmers, who in general are adults with many different types of concerns and often with extensive experience, the PEA focuses on reinforcing what they already know, with 80% of the activities being hands-on. During these seminars, the school children serve as an important link in reaching their parents. The talks are mostly participative and are aimed at fixing in the farmer's mind the idea that his financial resources are decreasing because his natural resources are being rapidly degraded. Audio-visual talks focus on problems directly affecting the peasants: lack of fence posts, lack of firewood, lack of timber for construction, soil impoverishment, etc. At all times, it is endeavored to obtain the ideas for solutions from the farmers themselves, by guiding their attention to the idea that in order to obtain the same yield in the long term, it is necessary to recreate the area's natural conditions. According to the peasants' needs, technical advice is provided on the following activities (to be performed by the peasants themselves): planting trees as living fences; planting trees for firewood and charcoal; family tree nurseries, and soil conservation measures. Emphasis is placed on the gradual introduction of agroforestry systems or forestry-pastoral systems, as well as on the need to preserve the small patches of woodlands that still remain on their properties. Technical assistance is always free of charge.

Results of the environmental education program

The PEA was inaugurated in 1987 with 7 schools, 14 teachers, and 182 pupils. In October 1988, there were 14 schools, 36 teachers, and 697 pupils. In this second period, PEA also included local farmers. Table 1 shows the number of pupils at each school and the success achieved. Table 2 shows the results obtained with local farmers.
An analysis of the two tables shows that, of the 14 schools, five (with a total of 240 pupils) have been quite successful, with the schools being planted with trees, a tree nursery in operation, and the cultivation of vegetables which are used in the pupils’ meals. Four schools have been partially successful and presently possess tree nurseries with developing plantlets; another 5 schools do not yet have any PEA activities. The PEA for local farmers has had a success of 11% in relation to the 124 families that live in the settlements around the Park.

The main obstacles to the PEA are: bad roads, the lack of appropriate vehicles for program technicians, and, in some places, natural conditions that are unsuitable for the establishment of tree nurseries. Other problems include: the great differences in the educational levels of the teachers, who have received three different levels of training; the lack of physical resources (e.g., tools, fertilizers); and the lack of specialized technicians within the Park’s personnel. The following activities are proposed as a solution to some of these problems:

- installation of a model tree nursery in the Park;
- intensive seminars at the teachers’ training institute nearest to the Park (in Pedro Juan Caballero, capital of Amambay Province), where future teachers receive only the first level of training;
- augment of the number of talks given to the peasants;
- application to various national and international private and governmental organizations for financial and technical resources; and
- review of the teaching materials used.

**Editorial update:** According to the evaluation in the SINASIP document (Sistema Nacional de Areas Silvestres Protegidas, published by the National Parks Administration; DPNVS, 1993), the area of Cerro Corá hardly deserves the management category of ‘national park’ due to the severe threats (agricultural and livestock grazing policies seriously jeopardize the ecological and territorial integrity of the Park) and its low representativity of the Amambay eco-region. In order to justify the management category, the document proposes an extention of the Park to include vast areas in the east that show little human alteration so far. Concerning the environmental education program, there have been no major changes in the past three years. Nevertheless, conflicts with the local farmers seem to have gotten worse, mainly due to political pressures, and management solutions will have to be found in the very near future (pers. com. C. Acevedo, February 1995).

CDC (1990a): Areas prioritarias para la Conservación en la Región Oriental del Paraguay. Asunción (Centro de Datos para la Conservación).


References

INDI (1982): Censo y Estudio de la Población Indígena del Paraguay, Asunción (Instituto Paraguayo del Indígena).
Peru

Problems in the enforcement of a strict national park policy
Felipe Injoque Espinoza
Gustavo Suárez de Freitas

Legal status of national park inhabitants
Enrique Ferrando Gamarra

Huascaran National Park: public consultation program
Juan Castro G.
Miriam Torres A.
Problems in the enforcement of a strict national park policy: the case of Peru

Felipe Injoque Espinoza
Gustavo Suárez de Freitas

Abstract: The analysis of recent development trends and their environmental repercussions for Peru presents a disturbing reality, reflected in the relationship between protected areas and their inhabitants. National parks are not to blame for the lack of development. On the contrary, they are also victims of the socio-economic conditions that limit or hinder the understanding and application of the national park concept. Native populations that preserve their traditional lifestyles do not necessarily live worse in national parks than outside of them. Sustainable use of resources should be encouraged outside of the national parks, throughout the country, and not just in such protected areas. Application of a strict national park policy requires action by an organized administration, with appropriate regulation and planning, endowed with professional, executive, and financial capacity at the highest political level.

State-protected natural areas, as we know them today, had their origin in the need, generated by the human development process, to maintain certain particularly valuable samples of our environment in an unaltered state. They are a response to increasing, and often uncontrolled, pressures on natural resources. The growth of large urban centers, industrial development, and their destructive effects on both the environment and human nature have led to increasing disappearance of natural environments, species, and ecological processes, and have made Man a destructive user of both natural and human resources.

The national park concept arose last century as a means whereby Man could have areas reserved for the preservation of the natural environment and for the recreation of present and future generations. The first objectives of protected areas were thus defined. Subsequently, due to the growing disappearance of species, the preservation of biological diversity became the fundamental objective of such protection. Thus, around the middle of the present century, priority began to be given to the creation of protected areas based on technical criteria designed to guarantee the survival of particular species and ecosystems.

National parks and other state-protected natural areas thus play a particularly valuable role, not only in preserving a sample of our natural resources, but also in the important task of guiding future development. Protected areas should be a basic component of a country's development strategy, since they provide a basis for long-term knowledge of ecosystems and renewable natural resources. Priority should be
given to research as applied to the understanding and development of technology for the integral, sustained use of natural resources. The whole range of area protection, from strictly protected areas to sustained management areas, should be the subject of studies and tests for proper use of our natural heritage. The information thus obtained will serve as the basis for land use regulation according to capacity, integrating the protected areas themselves as gene and information banks for the land management designed. Within this long-term process, tourism in protected areas could be one mechanism to ensure short- and medium-term profitability for the preservation of natural protected areas, since it is the activity that causes the least impact on the natural environment and is legally compatible with such areas.

Development trends and their effects on the environment

The development of human activity has evolved from the hunting and gathering phase, when population density had little effect on the natural environment, to that of grouping and settlement, with agriculture, livestock and, later, industry, thus generating destructive pressures on renewable and non-renewable natural resources that led to growing deterioration of the environment, extermination of species, and alteration of essential ecological processes. In response to this trend, the last century witnessed the creation, expansion, and consolidation of the conservation movement, based on the ethical principles of protecting and ensuring the survival of species, as well as the preservation of unique natural landscapes for the enjoyment of mankind. Destructive use due to economic and political interests still tends to persist, and is reflected in the unequal distribution of wealth, illegal trade in species, and in the lack of awareness of the value of rational management and sustainable use of natural resources. This trend survives side by side with the ever-growing and developing philosophy of conservation or eco-development.

The following points will serve to illustrate the above trends and also the way in which the development process now threatens the environment. The population of the Third World is likely to double in the next thirty years. In Peru, for example, the present 22 million inhabitants are expected to increase to 41 million by 2025, with an average growth rate of 2.5% per year (WRI 1990). Nevertheless, the annual increase in the Gross National Product (GNP) has decreased approximately 5% to 1.8% in the last 10 years and the percentage of the GNP represented by agriculture is only 11%. The foreign debt has doubled (over US$18,000 million) and the balance of payments has an increasingly negative trend.

Facing this panorama is the fact that the country possesses only 6% arable land: 3.81% suitable for cultivation and 2.11% suitable for tree crops. Given Peru’s population and its total area of arable land, only 0.346 ha (3,460 m²), on average, is available to each inhabitant, and this will decrease further if the population continues to grow, thus causing growing pressure on the protected and forested areas that account for 80% of the territory. These lands house 9% of the world’s
Problems in the enforcement of a strict national park policy: the case of Peru

mammal species, 18.5% of its birds, 4.6% of its reptiles, 6.4% of its amphibians, 6.3% of its fish, and 5% of its plants, not to mention arthropods and other less conspicuous forms of life. All this has led scientists to classify Peru as a country with biological megadiversity.

The “desperation for land” phenomenon that generates and aggravates the socio-economic trends referred to above is causing the degradation of protected and forested areas at an estimated rate of 0.4% per year, or some 350,000 ha per year. Since these trends noticeably affect the country’s future quality of life, integral strategies must be drawn up to revert them and achieve some degree of stabilization, followed by the reorganization and balanced development of the country.

In the context of this dilemma, consideration must be given to the role that protected areas play in development, as well as to their status. Tables 1 and 2 show the National System of State-Protected Natural Areas (Sistema Nacional de Areas Naturales Protegidas por el Estado, SINANPE). The lack of infrastructure, personnel and budget can be appreciated from the analysis provided in Table 3. Apparently, the State is not yet aware of the significance of the protected areas in the long-term development of the country. This is reflected, among other things, in the fact that the State does not yet possess a research program applied to development, promoting the knowledge and use of the country’s vast number of natural resources. Many of these have already made their contribution to the development of mankind, such as rubber, cinchona bark, potatoes, and numerous other products valued abroad and neglected or under-used here.

The protected areas should provide Nature’s technology and products and contribute to the country’s development by leading the way to sustainable use of our natural resources, thus making it possible to plan and regulate our land and our people in accordance with the country’s true potential. Table 2 also shows the average number of tourists that visit our national parks per year. On analyzing these figures in the light of the amount these tourists spend in the country, it can be seen that this represents millions of dollars. That is the value of the parks’ present contribution to the country. With Peru’s great biological diversity, ecotourism can be developed up to levels where it becomes a real option to benefit local populations whose use of natural resources inside national parks is otherwise very restricted.

National Park Administration in Peru

Development of the protected areas concept in Peru began in the late 1950s and early 1960s, when the first national park, Cutervo, was created by law on the initiative of the then congressman Salomón Vilchez. The reasons leading to the creation of this first protected area were more or less the same as those that gave rise to the first parks in other parts of the world. Cutervo National Park was established in order to preserve the caves of San Andrés de Cutervo for the enjoyment of present and future generations.
Map 1

Peru: national system of protected areas

- National park
- Other protected area
During the next five years, this initiative gradually developed into an organized planning effort with the support of international specialists. Thus began the technical planning of a national system of conservation units aimed at protecting representative samples of the country's great natural and cultural wealth. The way the Peruvian State has handled this enormous responsibility has been shown throughout the protected areas' short history by several bouts of institutional re-organization with the office in charge of park management increasing in importance each time. A decisive step toward the establishment of a natural protected areas system was taken in 1989 and 1990 with the creation of SINANPE.
## Table 2

<table>
<thead>
<tr>
<th>No.on Map</th>
<th>Conservation Units</th>
<th>Area in ha</th>
<th>No.on Map</th>
<th>Conservation Units</th>
<th>Area in ha</th>
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<tr>
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<td>26</td>
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<td>17</td>
<td>Sunchubamba</td>
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<tr>
<td>27</td>
<td>Manu</td>
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<td>El Angola</td>
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<td>Laquipampa</td>
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<td>Pantanos de Villa</td>
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<td>Yanesha</td>
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<td>32</td>
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<td>42</td>
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<td>33</td>
<td>Pari Pui</td>
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<td>43</td>
<td>Brabu Cordillera</td>
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<td>34</td>
<td>San Martin-San Carlos</td>
<td>145,818</td>
<td>44</td>
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*The SINUC areas (see Table 1) also form part of the National System of State Protected Natural Areas" SINANPE".*

It is important to have a clear picture of the evolution of the administrative structure in the second half of the present century. During the fifties, the Ministry of Agriculture was placed in charge and organized the Hunting Division (División de Caza), within the Fisheries Department (Dirección de Pesquería), to look after wildlife conservation and protection. During the 1960s, the Peruvian government issued Decree-Law 14,552 dated July 11, 1963, creating the Forestry and Hunting Service (Servicio Forestal y de Caza) as a dependency of the Ministry of Agriculture. One of this service's responsibilities was to allocate the state-owned forests and woodlands among areas for timber exploitation, national forests, and national parks. The concept of natural protected area management was also reinforced in this period, since national parks were defined as fully established areas at the service of the public.

During all this time, no consideration was given to the inhabitants of protected areas. The invasion by migrant or landless farmers is one of the most common problems faced by these areas, especially in regions of growing human population, either in the mountains or the eastern foothills. A very different case of inhabitants within protected areas is that of native communities, which, in Amazonia, are usually nomadic (or at an intermediate stage of development) and have a well-established relationship with their forest environment; or, in the Andes, communities that live from agriculture and grazing. In Huascaran National Park, for example, natural grasslands are used by local native communities.

In this initial period, the Forestry and Hunting Service received the proposal by the international expert Drewes (Misió OEA, 1965) to create Cutibireni National...
Problems in the enforcement of a strict national park policy: the case of Peru

Park, with the respective supporting studies. However, since the region was inhabited ancestrally by the Campa or Asháninka natives, who have remained in equilibrium with their environment and preserved the ecosystem via their traditional lifestyle, it was not considered necessary to create the national park at that time. The natives' ancestral rights over the area were subsequently reduced by the Native Communities Law (Ley de Comunidades Nativas), which limited their property to the officially declared community areas. Later, there was settlement pressure on the traditional Asháninka lands, so that the creation of the national park or some other protected area category was then justifiable.

The agrarian sector was restructured in the 1960s, and in the 1970s the Agrarian Sector Laws (Ley Orgánica del Sector Agrario, Decree-Laws 19,608 and 21,022), created the General Forestry and Hunting Administration (Dirección General Forestal y de Caza) within the organic structure of the Ministry of Agriculture as a normative agency in charge of the conservation, preservation, and use of forests and other renewable natural resources situated in the eastern foothills and lowlands.

The changes that had been taking place to preserve natural resources were not governed by any special legislation, so much so that in 1975 the military government, after a series of studies and consultations, approved the Forestry and Wildlife Law (Ley Forestal y de Vida Silvestre) in Decree-Law 21,147, providing that the agrarian sector, through the Forestry and Wildlife Administration (Dirección General Forestal y de Fauna), would be in charge of administration and conservation of natural resources at the national level. Based on this law, five complementary sets of regulations were approved. One of these was the Conservation Units Regulation (Reglamento de Unidades de Conservación), approved by Supreme Decree No.160-77-AG, which established policies and standards for the conservation and protection of natural resources through conservation units and created the National Conservation Unit System (Sistema Nacional de Unidades de Conservación, SINUC), consisting of four management categories: national parks, national reserves, national sanctuaries, and historic sanctuaries.

This outstanding stage in the development of the National Conservation Unit System was paralleled by the development of the natural protected areas concept, although emphasis was laid on the strict protection aspects. The treatment of inhabitants within protected areas was not dealt with in detail in this period either, except that the regulation established that native populations may only be permitted outside of protected areas. The forestry legislation only provides for subsistence hunting zones for the native communities in the form of communal reserves (reserva comunal).

Nevertheless, the first real experiences with traditional populations in national parks took place in Manú National Park. Here the development of the national park concept had to be reconciled with the existence of native populations belonging to three ethno-linguistic groups: (a) the Yaminahuas, Shara or Yoras of the Pano
linguistic family in the extreme north, who were not yet contacted at the time the Park was created; (b) the Machiguengas of the Arawak group, in the heart of the Park, who had been transferred to Tayakomé by the missionaries of the Summer Institute of Linguistics from outside the Park, as well as other groups living in an isolated manner on secondary rivers in the Manú River basin; and (c) the Mashco-Pira of the Piro or Harakmbet linguistic family, in a strip in the southwest of the National Park, whose existence was not known for certain when the Park was created.

A policy was developed to deal with this situation, with the support of anthropologist André-Marcel d'Ans and the technical cooperation of the Belgian Government. The proposal fitted into the framework of the strict national park policy, although it was not actually put into effect. It consisted of evaluating the native populations residing in Tayakomé, that is, the Machiguengas settled "artificially" in the Park, in their cultural and social aspects, as well as their interaction with the Park. The traditional territories of these groups would also be ascertained so as to identify unoccupied areas outside the protected area where they could be re-located and receive socio-economic support to enable them to integrate with the life of the country, at the same time maintaining the option to continue their traditional way of life within the Park.

During the 1980s, the Ministry of Agriculture was once more restructured by Legislative Decree No. 21, when the National Forestry and Wildlife Institute (Instituto Nacional Forestal y de Fauna, INFOR) was created to be responsible for the administration, direction, and management of the conservation units through Forestry and Wildlife Centers (Centros Forestales y de Fauna, CENFORs) in each province. The Forestry and Wildlife Administration was preserved as a normative entity.

The National Conservation Unit System was managed in a relatively efficient manner from the creation of INFOR until 1987, when the regionalization process commenced with the enactment of the Regionalization Law (Ley de Bases de la Regionalización, Law No. 24,650 modified by Law 24,792). This law provides that regional governments have authority and competence to decree and administer conservation units of a regional nature, while those that are national in character remain in the hands of the national authorities. At the same time, a series of changes were introduced in the agrarian sector; INFOR was deactivated and its functions, assets, budget and personnel were transferred to the Forestry and Wildlife Administration, with the exception of matters relating to research.

In addition, the National Parks Administration was created as a dependency of the Forestry and Wildlife Administration to take charge of the management of conservation units, but with the enormous limitation that it was only a normative office. To compensate the lack of administrative unity in SINUC, and based on the second Agrarian Sector Law (Ley Orgánica del Sector Agrario, Legislative Decree
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SINANPE was established in 1990, and to administer it in a unified manner, a national program was created, called the National Program for National Parks and Other State-Protected Natural Areas. This program, known as “National Parks-Peru”, has financial, technical, and administrative autonomy, and was later ratified in the last Organic Law on the Sector (Ley de Organización y Funciones del Sector Agrario, Legislative Decree 565) and its set of Regulations (DS 048-91-AG).

By 1991, the national parks program was fully established, based on the experience of three decades and taking into account the Regionalization Law and the new Environment and Natural Resources Code (Código del Medio Ambiente y de los Recursos Naturales). The program has the responsibility of expanding SINANPE through categories at regional and local levels and by creating a new approach to the issue of inhabitants in protected natural areas.

The Environment and Natural Resources Code (issued September 8, 1990) contains a whole chapter on protected natural areas. This presents the Peruvian State’s new position with respect to populations living inside protected natural areas. Ownership rights of the ancestral native or traditional farming communities are recognized, but are subject to conservation objectives and to the specific objectives of each protected area. Thus, Article 54 of the Environment Code set a precedent that directly affects the concept of “untouchability” of national parks. Of the nine SINANPE management categories defined, four involve strict protection: national parks, national sanctuaries, historical sanctuaries and protection forests. These areas are to be preserved in their natural state (including all associations of wild flora and fauna, landscapes, and geologic formations), and all human settlement and consumptive use of natural resources are prohibited. Such restrictions make it difficult to recognize ownership rights for traditional native communities, since in practice the law would permit hardly any activities apart from those traditionally performed by the natives to subsist, since the restriction imposed by Article 53 requires them to respect the objectives of the protected area. Such a situation might be applicable to uncontacted native groups, or to groups with traditional behavior and very low and stable populations, but it would be necessary to maintain such groups in that condition permanently.

This concept is almost the same as has always been upheld in Peru regarding the strict definition of national parks. This position is obviously meeting with growing opposition from the recently created and developing non-governmental organizations in support of native communities, as well as from the indigenous organizations themselves, not to mention the ideological trends to defend the natives’ rights on the principle that the native communities constitute the best mechanism to guarantee the conservation of biodiversity in Amazonia.

While the above claims cannot be denied, it is precisely outside of the parks that these principles should be tested. Their aim is to obtain more land and more self-determination for native peoples, but not at the expense of the national parks.
Within the parks themselves, agreement could be reached between park authorities and inhabitants so that the latter may continue their traditional way of life, and at the same time take part in decisions concerning the park’s destiny and management.

The Environment Code undoubtedly represents a significant step forward when it provides for native communities to participate in protected area management. An interesting point for coordination in the relations between park administration and inhabitants is to document and re-vitalize native technologies for the sustainable use of natural ecosystems that are valid for application in similar areas where use is permitted. This also makes it possible to achieve some of the most significant purposes of protected areas: to preserve biodiversity, to perform research on uses and applications to meet human needs, and to transmit the knowledge obtained for the benefit of neighboring communities.

Technical aspects of SINANPE

Peru has seven national parks (parques nacionales), eight national reserves (reservas nacionales), seven national sanctuaries (santuarios nacionales), three historical monuments (santuarios históricos), five reserved zones (zonas reservadas), two communal reserves (reservas comunales), two hunting reserves (cotos de caza), six protection forests (bosques de protección) and five national forests (bosques nacionales). The first four categories make SINUC, and cover 4.2% of the country. Together with the remaining categories, they form SINANPE with a total area of 13,143,724 ha or 10.31% of the country (see Tables 1 and 2). Under Decree D.S.010-90-AG of May 20, 1990, the administration of this heritage is the responsibility of National Parks-Peru, which does not entirely fulfill this mandate, however, due to the above-mentioned administrative evolution, and because it represents the first attempt at unified administration of the protected areas system.

These state-protected natural areas are distributed throughout all the political and natural regions of the country, with 587,223 ha in the coastal region, 975,679 ha in the mountains, and 11,580,822 ha in Amazonia. The major part of this last figure is concentrated in the humid tropical forest of southeastern Peru, in the present Inka Region.

An analysis of the categories reveals that there is quite a wide range of options, two of which are worthy of note, since they were intended for traditional native communities. One is the category of communal reserves created to provide and maintain areas where communities can engage in subsistence hunting, when it is evident that they are highly dependent or live on this. The other is the indigenous reserve (reserva indígena). This category was created by the Native Communities Law for “uncontacted nomadic native groups” that preserve their culture and neither desire, nor seek, contact with our culture. Of the two indigenous reserves, one was
created in 1990 in the northwestern buffer zone of Manú National Park, as an area for the Yaminahua and Kugapakori groups of Machiguenga Indians who do not desire any contact. The declaration of this indigenous reserve was made all the more urgent by inflow of settlers and the recent discovery of large gas deposits at Camisea, some 40 km to the west of the Park.

Table 3 provides a summary of the deficiencies in administration, personnel, equipment, and other important aspects. It also enables us to obtain a partial understanding of SINANPE’s current situation. The most outstanding problem is that only the SINUC areas bring together most of the conditions necessary to be considered protected areas on the ground. The great majority of the rest are only protected on paper, offering a guarantee only against “formal” aggressions, such as government or industrial projects. This is significant in some cases, but is clearly insufficient. In other cases, there are areas within SINUC that have been abandoned due to lack of funds, in addition to having been administered by agrarian units or development corporations that did not assign them sufficient importance. In any case, the analysis provided in Table 3 makes it possible to gain perspective and assign priorities without forgetting National Parks-Peru’s most significant function: to ensure the preservation of representative samples of the nation’s biodiversity.

By way of a conclusion

The situation as described above leads us to the following basic reflections:

- While it is true that an attempt has been made in the legislation and administration of Peru’s protected areas to apply a fairly strict policy with regard to inhabitants in national parks, it has been, and still is, difficult to put it into practice due to the critical economic and social situation in Peru, which generates excessive pressure on such areas and also makes it difficult to provide such inhabitants with other options.

- The national parks are not to blame for the lack of development; on the contrary, they are victims of the socio-economic conditions that limit or hinder the understanding and application of the national park concept.

- Native populations that preserve their traditional lifestyles do not necessarily live worse in national parks than outside of them. One proof of this is the fact that the Yaminahuas retreated into Manú National Park when subjected to pressure from oil enterprises, and many of the Machiguengas prefer to live in a traditional manner in the Park rather than go outside of it and change their lifestyle. (An extreme case of this is that of the Kugapakori.)

- Sustainable use of resources should be encouraged outside of the national parks, throughout the country, and not just in such parks.

- The Environment Code has created expectations with regard to the rights of communities in the parks, but such ownership is subject to the objectives of
protection areas. This makes it necessary for the parks administration to regulate conditions compatible with the two interests, or, in the event of total incompatibility, to anticipate the need to provide new options for the communities in areas adjacent to the parks (which should be reserved for that purpose), so as to maintain both options. Great care should be taken to verify ancestral rights, and procedures and conditions should be established to guarantee such rights.

One specific case of ownership rights is provided for in the Environment Code: that of Huascaran National Park, where traditional communities are present. These pastoral people have restricted their use to a maximum of 40% of the park area, avoiding serious alterations, such as burning or the introduction of exotic species. Despite the proposed careful management, the situation is not compatible with the definition and imposition of "untouchable" areas. The administration has undertaken to continue this type of controlled use, but also to continue seeking and developing alternatives outside of the Park aimed at improving and reverting this situation.

Application of the strict national park policy requires action by a systematic, national, and ongoing administration, with appropriate regulation and planning, endowed with professional, executive, and financial capacity at the highest political level. All of this is extremely difficult to achieve, and this could result in the adoption of the easiest course of action - that of leniency - , not because it is found necessary or best, but because of an inability to solve basic problems.

**Editorial update:** At the end of 1993, the process began for participative formulation of the Directive Plan (Plan Director) of the National System of State-protected Natural Areas, and during 1994 a detailed diagnostic analysis was conducted of the current status of the System, including aspects relating to populations that live within, or are otherwise linked to, the protected natural areas. Although the Plan will not be completed until mid-1995, it is clear that the relationship between protected areas and local people will be dealt with in various sections of the Plan. The adoption of a system of categories that permit the sustainable use of resources (as in the new IUCN categories V and VI) and the formal adoption of participative planning mechanisms (especially with respect to the management of natural resources) will be reflected in the Plan. During the past three years, the number and magnitude of management activities in the protected natural areas that seek to reconcile the protection of natural areas with the satisfaction of the needs of the local people have increased considerably. Such projects are taking place in the Pacaya Samiria National Reserve, Manu Biosphere Reserve, Northwest Biosphere Reserve, Mangroves of Tumbes National Sanctuary, Ambay National Sanctuary, Tabaconas National Sanctuary, Paracas National Reserve, Tumbes Reserved Zone, Pampas del Heath National Sanctuary, and Tambopata-Candamo Reserved Zone (the last two of which are contiguous and may be integrated into a large national park, including all of the Sanctuary and part of the Reserved Zone). All these projects are based on:
participative planning, resolution of conflicts, identification of resources that may be legally utilized in a sustainable manner, zoning proposals, and/or changes in the category of the area to promote the compatibility among different management objectives. The Tumbes National Forest was re-categorized as a Reserved Zone, via a process of participative planning. This measure was taken only for the time being, until there is legal approval of a category equivalent to IUCN's new category VI (pers. com. G. Suárez, February 1995).
Legal status of national park inhabitants in Peru

Enrique Ferrando Gamarra

Abstract: In Peru, many national parks have been established in areas where private rights to the land already existed. These rights continue to be valid, despite the creation of protected natural areas. Peruvian law establishes that national parks are inviolable and declares that they are public property. Private ownership rights to such areas are therefore impermissible; the Constitution, however, guarantees that laws not be applied retroactively. At the same time, the State is required to remove squatters and other persons who have no legal rights. The Peruvian Environmental Code authorizes the State to impose restrictions on the exercise of land ownership rights, to expropriate private property situated in the parks, or to negotiate the exchange of such lands. Wherever possible, the law provides for the involvement of inhabitants in the conservation of the protected areas in question.

The subject of inhabitants in national parks is taboo for many Peruvian conservationists, who consider it one of the most frustrating expressions of the protectionist ideals inherent to national parks. This issue is also ignored by legislation, since there is no effective social pressure on the legislators to deal with the situation and develop alternatives.

National park inhabitants are usually farmers who depend on the land for their subsistence. These people are currently experiencing important social and economic changes: they are beneficiaries of the land reform (reforma agraria) instituted in 1969 with Decree Law (Decreto Ley 17,716). This reform, which is still in effect, stems from the crisis of a rural property and wealth distribution system that was considered unacceptable for Peru. This land reform is characterized by radical structural changes which, under the slogan "the land belongs to those who work it", seek to assert the rights of poor landless farmers, recognize indigenous communities' ancestral land rights, and promote cooperative or communal forms of rural development.

The legislators who promoted rural peoples' rights gave no consideration at all to the possibility of overlap among lands belonging to a farmer or a community and those of a national park. In the rare cases where the legislation dealt this problem, the national parks were considered irrelevant to the farmer, and should not affect the rural property in question. As a result, legislation regarding rural communities either does not deal with this issue at all, or does so in an inadequate, and often incorrect, manner.
It was not until 1990 that the first legislative attempt was made to provide legal standards regarding the issue of people living in protected natural areas. The Environment and Natural Resources Code (Código del Medio Ambiente y los Recursos Naturales, CMA), enacted in September of that year, recognized the presence of inhabitants and occupants in such areas and established guidelines for solutions based on the inhabitants’ rights, as well as on the national interest in conserving the protected areas.

The following pages contain an analysis of the laws and regulations applicable to this issue, as well as of certain relevant legal principles, with a view to determining: the rights of national park inhabitants in Peru, the terms under which they may exercise these rights, and the problems this may create for the conservation of natural areas. For the reasons mentioned above, this analysis must inevitably be based on the legislation that deals with national parks, and not on the laws concerning rural peoples’ rights. The issue in question is the relationship between the property rights of individuals and the inviolability of the protected natural area. Since property rights are common to almost all types of inhabitants, a description of the legal status of each type is of little help in solving the problem, so reference is made to specific categories of inhabitants only when necessary to indicate an exceptional situation.

**National parks in Peruvian legislation**

National parks are one type of conservation unit (unidad de conservación) within the scope of protected natural areas (área protegida natural). Article 51 of the Environment and Natural Resources Code defines protected natural areas as “tracts of the national territory that the State sets aside for research, protection, or controlled management of their ecosystems, resources, and other natural assets.” The provision adds that “protected natural areas are public property and contain representative samples of the Nation’s natural heritage. They are established on a permanent basis.”

The current Forestry and Wildlife Law (Ley Forestal y de Fauna Silvestre) specifies that national parks are “areas reserved for the protection, on an untouchable basis, of their natural associations of flora and fauna and the beauties of their landscapes”. The Regulation of this Law, approved by Supreme Decree (Decreto Supremo), reiterates this definition, adding that in view of the inviolable nature of such areas, “all direct use of natural resources and settlement of human groups is totally prohibited in national parks”. It also stipulates that in these units “the entry of visitors for scientific, educational, recreational, and cultural purposes is permitted under special conditions”.

According to the Regulations, the term “inviolable nature” is understood to mean “the preservation in their natural state of all the associations of wild flora and
Recientemente se lanzó una encuesta en su Municipio e inclusive en la Oficina de FORTUR-Huanta y hemos recogido su opinión sobre los problemas que existen en el Parque Nacional Huascaran.

En febrero se realizará la visita a las comunidades, para juntarse y examinar las alternativas para la futura administración de nuestro Parque.

En marzo se presentará la propuesta preliminar de la nueva política administrativa del Parque. Antes de la elaboración de la propuesta final, todas las sugerencias se tomarán en cuenta.

Perú. Photos 51/52/53: Huascaran National Park, in the Northern Andes of Peru, has been declared a World Heritage Site by UNESCO. One of its greatest challenges is the proximity to several extremely poor rural communities. Lack of effective park management had led to conflicts between the park administration and the local population, before a public consultation program, started in 1988, increased their mutual understanding of problems and aspirations.
Peru. Photos 54/55: In Huascaran National Park, traditional farmers and livestock grazers attended public consultation meetings during the formulation of the Park's management plan. Puppet shows and hands-on activities carried out in the local Quechua dialect played an important role in the success of this program that also aimed at finding sustainable development alternatives for the local population.
fauna, landscapes, and geological formations. In cases where some or all of these resources are made available to the public for research, recreation, tourism, education, and culture, these activities shall be performed in zones specially reserved for such purposes, ensuring the least possible environmental modification of such areas”.

According to these legal texts, therefore, national parks are management units created fundamentally for the preservation of the resources they contain, and this objective, as indicated above, does not permit the settlement of human groups or the direct use of the parks’ natural resources. Inviolability is therefore an inherent feature of national parks. In the end, however, such inviolability of national parks and other protected natural areas is little more than a purely legal concept. What the regulation really seeks to prevent are activities of a permanent nature that could endanger the objectives for which national parks were created. Rights that anyone may have concerning ownership or use of park lands should be considered incompatible with the parks' objectives; the law condemns such rights a priori.

Neither the Forestry Law nor its Regulation contain rules intended to solve the problem of inhabitants in national parks. The rules simply prohibit the presence of such inhabitants, ignoring the fact that they may have a perfect right to remain there. Indeed, Article 1 of the Forestry Law states that forest resources and wildlife are public property and are not subject to any acquired rights. Since this Law considers conservation units to be a forestry resource, the law cannot recognize rights acquired prior to the creation of a national park. The parks, once declared, become publicly owned areas that do not admit the coexistence of any other kind of rights.

National parks vs. acquired rights

Article 187 of the State Political Charter (Carta Política del Estado) states that no law has retroactive force or effect. This universal principle guarantees that no rule may modify or alter situations or events that occurred under the authority of prior laws. In other words, it guarantees that legal norms apply to the future and not to the past.

In the application of this principle of “legal non-retroactivity”, the reconciling of the conflicting interests between national parks and their inhabitants is fundamental. When an area is declared a national park by the State, it immediately becomes subject to all the legal provisions affecting national parks. Logically, such provisions apply to the area concerned as of the date it becomes a national park, but they are not retroactive and do not alter or modify legal situations existing prior to that date. It is only from that date onward, therefore, that there is a prohibition on new human settlements in the protected area, and on the acquisition of new ownership or usufruct rights within the park, since such rights are incompatible with the definition of “publicly owned area”.

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Following this line of reasoning, it can be easily inferred that rights acquired prior to the establishment of a national park remain valid, since they represent legal situations covered by prior laws that were applicable to the area in question. Non-recognition of this principle could give rise to the possibility of property being confiscated in Peru without any right to indemnity, which would be a serious violation of several constitutional guarantees and an offense against the State.

Not all rights existing prior to the creation of a national park, however, remain valid after its creation. Only rights of a “real” nature are maintained, which are thus enforceable \textit{erga omnes} (against all). This rule does not apply to simple possession rights of a temporary nature, inasmuch as they are the result of bilateral contracts between private persons and the State for the usufruct of a certain area.

From the above, it may be concluded that once a national park is created, no new rights may be established therein that are incompatible with its character as public property. “Real” rights acquired prior to the establishment of the protected area, however, remain valid and must be respected. Such rights are the right to ownership, possession, use, and usufruct, or any other right with the features referred to above.

In addition, rights acquired under concession contracts made with the State for the exploitation of natural resources may be considered rights of a “real” nature (apart from mining rights, which are granted that nature by the Constitution), but may be rescinded at any time by the State for a justified cause, such as the declaration of a national park.

\section*{Acquisition of the rights of ownership}

It is not difficult to understand the principle of “legal non-retroactivity” and its application, in theory, to the inhabitants of national parks. Complications arise, however, in applying that principle to specific situations. In order to establish or clarify the rights of a certain inhabitant of a given national park, it is necessary to have reliable information about the way in which ownership rights were acquired, the acquisition date, and the date the area was declared a national park and therefore became inviolable.

\subsection*{The way ownership was acquired}

This information is important because not every acquisition of ownership serves to clarify the owner’s rights. In Peru, the mere possession of a property gives the holder certain rights that are enforceable against third parties. Some of these rights are only acquired through continuous possession for a certain length of time, as in the case of ownership, which may be acquired through prescription after ten years of continuous, peaceful, and public possession as owner. For this purpose, the Civil
Code of Peru authorizes the holder (whether owner or not) to add his period of possession to that of the person who validly transferred the property to him. This makes it possible for a person to be the owner of a property for only 2 years but to have had possession of it for 50 years, by adding those 2 years to the 48 years it was in the hands of its previous occupants.

This means that even though an inhabitant may have acquired his right after the creation of the park, such acquisition is valid if the sum of all the periods of possession shows that the private ownership of that piece of land dates from before declaration of the protected natural area. Moreover, ownership acquired under these circumstances cannot be annulled, even though the land changed hands after the creation of the national park, since this would mean that the former owner is being denied his right to transfer his property, which is not possible under the law.

Thus it becomes clear that the only form of acquisition of ownership that is of interest as a reference for the application of the "non-retroactivity principle" is where land passes from public to private ownership, that is, property acquired from the State. Once this operation is completed, all new private owners may add prior ownership periods to their own, so that it will always be necessary to go back to the original acquisition date.

The date the property was acquired

This is of great importance, since it is the only way to determine whether the acquisition is valid or not. If this date is prior to the creation of the national park, the owner's rights are not affected and he continues to own his land, even after the national park declaration. On the other hand, if the property was acquired after the area was declared a national park, the ownership is void, since it involves the transfer of public property, which is not governed by private law since it is not subject to commercial operations.

In the case of Peruvian indigenous groups, determination of the property acquisition date may be extremely difficult. The Constitution recognizes the legal status of traditional native communities solely based on their presence, without requiring registration of any kind. It also establishes that their land ownership rights are untransferable and inalienable. In addition, the registration of indigenous lands is only informative, since their land rights are already established and unquestionable. Peru, therefore, has a large number of still unidentified, or at least unregistered, indigenous communities which nevertheless possess legal status and ownership of the land. By identifying them, registering them, and establishing the boundaries of their lands, the State is only fulfilling a formality that does not affect their rights.

As opposed to traditional indigenous communities, there are also "modern" communities consisting of people who have been the beneficiaries of land reform and have grouped themselves together in order to be recognized as communities.
These people have no traditional rights to their land and the only way they can become owners of it is through State grant. In this case, the granting of ownership is constitutive in nature and not just informative, as referred to above.

Unfortunately, national legislation is rather vague in distinguishing traditional indigenous communities from modern communities, since it treats them all in a similar manner. Traditional indigenous communities are those whose cultural, economic, ethnic, and linguistic identity date back more than 80 years. Modern communities are a result of land reform and its provisions for community-owned land. It is essential to distinguish these two types of communities in endeavoring to determine their rights as inhabitants of national parks.

In the case of traditional indigenous communities, their land ownership rights are also traditional and, consequently, date from before the park’s creation. This is true even if their lands have not been legally recognized or identified, since this formality (being informative and not constitutive) may be complied with after the creation of the national park. In doing so, the State is not violating any law.

On the other hand, in the case of a modern indigenous community, the State is prevented from granting land titles after the creation of a national park, since such grants are constitutive in nature and new rights cannot be constituted on property once it is public. In this respect, the Environmental Code establishes that “the State recognizes traditional native communities’ ownership rights to the land they possess within protected natural areas.”

It thus ends a long-standing argument between conservationists and defenders of indigenous peoples to the effect that ownership of land is recognized only for those who have traditionally held it. At the same time, this eliminates the thoughtless assimilation of traditional indigenous communities into the regime of “modern” communities, which is only a product of land reform.

Date on which the area became a national park

This information is easy to obtain, since it is only necessary to ascertain the date of declaration. National park declaration in Peru is done by Supreme Decree, which takes effect the day after its publication in the official register, unless the decree indicates otherwise.

It must be borne in mind, however, that before an area was officially declared a national park, it may have been an area protected or reserved by the State for certain purposes, and this situation would also have prevented a private individual from acquiring the ownership of land within the area. This could occur, for example, in the case of a national sanctuary which is later declared a national park. In this case, the prohibition on acquiring private rights to the area in question goes back to the date on which it was declared a national sanctuary, since, although there has been a variation in category, its public use status already existed prior to its being designated a national park.
Rights of legally established inhabitants in national parks

The rights of these inhabitants are the same as those held prior to the establishment of the national park, but with greater restrictions on their use. This stems from the social function of property, recognized worldwide, according to which ownership obligates the holder to use property in harmony with interests of society. In the case of agricultural lands, for example, such “social interest” consists in keeping them productive, and in urban areas the exercise of ownership rights does not permit the holder to misuse such rights or cause annoyance to third parties.

Article VII of the introductory chapter of the Environmental Code states that “the exercise of ownership rights for social interest includes the owner’s duty to act in harmony with the environment”. Such duty is obviously much stricter when the premises are situated within the boundaries of a national park. The Environmental Code also states, in Article 53, that “the exercise of ownership and other rights acquired prior to the establishment of protected natural areas should be in harmony with the objectives and purposes for which the latter were created”. Under this rule, the State should evaluate the need to impose other limitations on the exercise of such rights in each individual case.

At no time does the Environmental Code deny the existence and legitimacy of people’s rights over lands located within protected natural areas. It only points out that such rights should be exercised in harmony with “social interest”, explaining that in these specific cases “social interest” is defined by the purposes and objectives of the protected natural area in question. For example, the owner of agricultural land situated in a national park may continue using it for that purpose but may not produce crops that degrade the soil, or raise a type of livestock that causes more damage than another. In working the land, he may employ only technologies that guarantee minimum alteration of the environment.

While it is true that these rules are not a solution in all cases, they do provide a reasonable alternative in many situations where national legislation was too inflexible, even though it was proven, for example, that certain indigenous settlements did not cause any deterioration of the environment but rather formed part of the ecosystem.

Solutions available to the State

National legislation provides the State with numerous alternatives for protecting national parks from excessive alteration by their inhabitants. The most important are the following:

Ownership restrictions. It is essential that the State identify the human populations that legally inhabit national parks and then regulate the exercise of these inhabitants’ rights over their land, so that it takes place in harmony with the objectives
and purposes of the protected natural areas. This is an arduous task that requires the support of non-governmental organizations, as well as international cooperation.

Expropriation. Article 25 of the Constitution empowers the State to expropriate property "for reasons of public necessity and utility, and those of social interest, as defined by the law, and subject to the payment in cash of a duly appraised compensation". This is permitted even in the case of lands belonging to native communities, whether traditional or not. For its part, the Environmental Code indicates that "rights, the exercise of which is contrary to the purposes and objectives of protected natural areas, may be expropriated". In summary, the State is not prevented from exercising this power when it is the only way to maintain and guarantee the inviolability of a national park. Needless to say, expropriation should be considered only as a last resort, but that does not mean it should be ruled out entirely.

Transfer of property. Without having to go to the extreme of expropriation, it is always possible to negotiate with the inhabitants of a national park so as to exchange or purchase their lands for the benefit of conservation. This option is open to the State, through its various conservation agencies, provided the inhabitants are not a traditional indigenous community, since the Constitution of Peru stipulates that their lands are inalienable, unless such transfer is approved by a special law after compliance with very complicated procedures.

Integration of the inhabitants in park conservation. A national park inhabitant is a potential park warden; he can be recruited to perform the difficult protection and control work that is necessary in all protected natural areas. He is usually the one who knows the zone best, and even though he does not take on this task as his main occupation, it will still aid in lightening the State’s heavy burden in this task. The Environmental Code sees this as a way to avoid conflicts with the owners of lands located within national parks, and it should be put into practice wherever possible in all national parks.

A case study: pasture users in Huascarán National Park

Huascarán National Park, located in the Peruvian Andes (the world’s largest tropical mountain chain), was for some time the scene of a conflict between the park authorities and the farmers who claimed rights within the park. To end this conflict, the government issued Ministerial Regulation N° 1200-80-AG-DGFF (dated September 16, 1980) regulating the use of the park’s natural grassland. It established the obligation of entering into agreements with the users of such pastures, specifying the conditions for managing the resources according to the situation of each grazing site. Local communities, companies, and individual users have been included in these agreements, as well as small and medium-scale livestock breeders who were in possession of the area at the time Huascarán National Park was declared by Supreme Decree N° 622-75-AG.
In these agreements, the users promise: not to alter the natural landscape, to avoid hunting or capturing wild animals or cutting trees or shrubs, not to burn pastures, not to bring in hogs or goats and to avoid over-grazing, as well as to fulfill the other obligations made by the Pasture Users Committee for their sector through the Internal Regulation for Natural Pasture Users (Reglamento Interno de los Usu-arios de los Pastos Naturales). Although some pasture users own their lands, the livestock activities they perform must not jeopardize the quality of the land they possess.

While this procedure should serve as an example for all Peru’s national parks, it should be borne in mind that mistakes were made. One of the greatest errors was to give the same treatment to inhabitants and occupants, the former being understood to mean true owners, with the resulting right to remain on their land, and the latter to mean recent occupants, with no rights whatsoever. Apart from this, however, the mechanism described above is a good example of how to implement a system to restrict the exercise of ownership rights for the benefit of a national park.

**Editorial update:** In December 1993, Peru approved a new Political Constitution, which includes several changes concerning the treatment of traditional indigenous and farming communities located within national parks. There are also clauses concerning the expropriation of land for the establishment of new parks. In the first case, traditional communities have been "liberated" from the previous constitution’s determination that their lands were unseizable and inalienable. This means that these communities can now sell their lands, even if they are within national parks. We should keep in mind, however, that the third parties purchasing these lands would face the same restrictions on land use as the communities: only uses that do not conflict with the goals of the park are allowed. In the second case, the article of Environmental Code that had permitted the expropriation of land in order to establish parks was repealed by Legislative Decree 708. The Constitution of 1993 changed the procedures for expropriation, establishing in its Article 70 that “no one may be deprived of his land, unless it is exclusively for reasons of national security or public necessity, as declared by Law, and following appropriate payment for the land.” As can be seen, this matter has become more complicated than it was under the previous Constitution, under which expropriation could be justified by “interes social”, social concerns (pers. com. Dr. Pedro Salano, Conservation Director, Sociedad Peruana de Derecho Ambiental, January, 1995).
Abstract: The management plan for Huascarán National Park, classified as a World Heritage Site, was formulated based on a public consultation program. One of this Andean Park’s most outstanding features—and one of the greatest challenges for its management—is its close proximity to population centers containing in all about 227,000 inhabitants. The greater part of this population is organized into 50 farming communities that live in extreme poverty. Since the lack of effective management had kept the Park at a distance from the local and national community for 15 years, the proposed opening-up process through public consultation first appeared to cause more problems than benefits, but the progress of the program and open discussion of each sector’s interests gradually created greater confidence and trust in the Park.

Between 8°30' and 10° S latitude, the Peruvian Andes form a natural “callejón” (valley, canyon), bordered by steep walls. The western wall of the “Callejón de Huaylas”, which lies approximately 400 km north of Lima, consists of the Cordillera Negra (with altitudes under 5,000 m above sea level), and the eastern flank is formed by the almost entirely snow-covered Cordillera Blanca, which includes the highest mountains in South America, apart from the range of Andes running along the Chile-Argentina border. From the city of Huaraz alone, the Departmental capital, 23 snow-crested peaks of over 5,000 metres can be seen, of which the most notable is the Huascarán (6,768 m), the highest mountain in Peru.

Although the snowline now stands at the 5,000 m level it was not long ago (geologically speaking) that snow and ice covered the Callejón at 3,000 metres. Despite its receding snowline, the Cordillera Blanca still contains the largest concentration of glaciers found in the world’s tropical zone. The retreating glaciers leave behind terminal moraines, many of which function as natural dykes for beautiful, turquoise-colored glacial lakes (“cochas”).

Several arqueological sites, like the famous Chavin fortress temple (800 BC) and its surroundings, indicate that the area has been settled for thousands of years. Scientists assume that camps and temporary settlements of hunting and gathering cultures even date back to 8,000 BC. Because of its outstanding natural and cultural features, the Huascarán area was declared a Biosphere Reserve in 1977 and a World Heritage Site in the 1980s by UNESCO.
The area's population

The National Park is situated in the Cordillera Blanca, between the Callejón de Conchucos on the east and Callejón de Huaylas on the west. Both of these areas have human populations that use resources within the Park. The rural population in the Park's area of influence is estimated at 227,022 inhabitants, distributed over 31 districts and 10 provinces of the Chavin Region of Ancash Department. A significant part of this population is organized in 50 farming communities, with those in Callejón de Conchucos having the lowest standard of living (Table 1). The urban population (representing 30.6%) is mainly concentrated in the larger towns of the Callejón de Huaylas. The main economic activities are the handicraft production, tourism, and commerce related to Huascarán National Park.

Relationships between the Park and its users

The following activities are carried out within the Park: grazing, logging, collection of medicinal plants, agriculture, mining, and tourism. The Park also includes important watersheds for hydro-electric and irrigation projects.

Grazing. 45.71% of the Park is covered by natural grasslands, which are used by 3,000 people organized into 33 Grass User Committees (Comités de Usuarios de Pastos). There are also non-registered cattle-owners who make unauthorized use of the grasslands. The basic problem with this user group is over-grazing, which impoverishes the soil and increases the tendency for erosion in areas with steep slopes.

Forest resources. Native forests cover 2.01% of the Park, and this area is exploited by the rural population in the form of commercial logging, illegal hunting, and collection of medicinal plants, which are marketed in the towns of Callejón de Huaylas, and in Lima.

Agriculture. Only 0.01% of the Park is farmed. This is done by 74 families, 86% of whom are located at Llamacorral and Auquispuqio (Callejón de Huaylas), and Tamillos and Ragracancha (Callejón de Conchucos). The pressure to expand this cultivation is a source of concern for the Park.

Water resources. There are 663 glaciers with a total volume of 22.46 km³, as well as 296 lakes with a total water volume of 435,086,656 m³, and 41 rivers whose waters flow into the Santa, Marañón, and Pativilca Rivers. This water is very important to the Chavin area, particularly in terms of hydro-electric power and irrigation. The infrastructure required, however, could damage the Park's fragile ecosystems. Glacial ice is used in the local towns, but this is still relatively insignificant.

Mining. The Park's abundant metallic and non-metallic ore deposits have been mined since before the Park's creation, causing negative impacts to the environ-
Map 1

Peru: public consultation workshops in the area of Huascaran National Park

- Workshop site
- Village taking part in the workshop
- Main town

Route followed for workshops at Chavin, Huantar, Huari, Acopalca, Chacas and Shilla

Route followed for workshops at Llanganuco and Yanama

Park boundary
In addition, there is small-scale coal mining near the village of Tambillos, located within the Park.

Tourism. This is an important economic activity for the urban population of the Callejón de Huaylas, and is based on the natural beauty of Mount Huascaran. These “non-consumptive users” would like to increase tourism in the area, however, with no regard for participation of the rural population or for the importance of protecting the Park itself, although this is their most important resource.

The park administration

Until 1990, Peruvian protected areas were grouped together in the National Conservation Unit System (Sistema Nacional de Unidades de Conservación, SINUC), whose main authority, the Director of National Parks, was subordinate to the General Forestry and Fauna Office (Dirección General Forestal y de Fauna, DGFF) of the Ministry of Agriculture. This system was not centrally organized, and the administration of each protected area was the responsibility of either the local Agrarian Departmental Office or the Departmental Development Corporation (Corporación Departamental de Desarrollo, CORDE).

Huascaran National Park was managed (and partly financed by) the Ancash Agrarian Departmental Office, partly financed by CORDE-Ancash, and regulated by the DGFF. Since DGFF was the farthest away and contact with the Park was infrequent, it had the most distant relationship of all. Apart from salaries, the Park’s operating funds were almost non-existent, consisting of 30% of the Park’s user and entrance fees (70% remaining in the Lima office). This confusing administrative situation, together with the Park’s lack of independent resources, hindered the development of the public consultation program and the management plan, in general. In 1990, the National System of State-Protected Natural Areas (Sistema Nacional de Areas Naturales Protegidas por el Estado, SINANPE), was established and put in charge of Peru’s National Parks Program. This created a unified national park system with administrative and financial autonomy.

During the pre-election year of 1989, politicians at all levels carried out social and economic programs. The population’s demands, and the politicians’ promises, focused on raising standards of living and on the direct management of natural resources by the local organizations, particularly the rural ones (such as the Ancash Departmental Agrarian Federation). These proposals were an important political banner in Ancash, and in late 1989 and early 1990, Huascaran National Park was included in the politicians’ pre-election promises. One party, for example, offered to hand over the Park to the local communities so that they could manage and administer it directly. At national level, the Park was offered to the organizations of poor farmers through the creation of a large agro-industrial enterprise.
### Table 1

**Peru: area of influence of Huascarán National Park**

**Standard of living indicators**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Eastern Flank</th>
<th>Western Flank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of inhabitants</strong></td>
<td>167,074</td>
<td>59,948</td>
</tr>
<tr>
<td><strong>Rural population</strong></td>
<td>67.3%</td>
<td>74.44%</td>
</tr>
<tr>
<td><strong>Econ. active population with incomplete elementary education</strong></td>
<td>45.64%</td>
<td>30.33%</td>
</tr>
<tr>
<td><strong>Economically active population with higher education</strong></td>
<td>7.98%</td>
<td>3.15%</td>
</tr>
<tr>
<td><strong>Illiteracy</strong></td>
<td>43.25%</td>
<td>48.47%</td>
</tr>
<tr>
<td><strong>Unemployment</strong></td>
<td>4.59%</td>
<td>4.34%</td>
</tr>
<tr>
<td><strong>Workers between ages 6 and 14</strong></td>
<td>2.31%</td>
<td>3.08%</td>
</tr>
<tr>
<td><strong>Health establishments per 10,000 inhabitants</strong></td>
<td>2.16%</td>
<td>1.09%</td>
</tr>
<tr>
<td><strong>Population with no electricity</strong></td>
<td>72.25%</td>
<td>84.06%</td>
</tr>
<tr>
<td><strong>Population with no water supply</strong></td>
<td>57.92%</td>
<td>60.38%</td>
</tr>
<tr>
<td><strong>Population with sewage facilities</strong></td>
<td>78.53%</td>
<td>83.01%</td>
</tr>
</tbody>
</table>

Meanwhile, in 1989, development of a management plan was initiated, along with a public consultation program. In early 1990, work was made on the Research and Development Conservation Plan and a Scientific Cooperation Workshop Seminar was held. Success was achieved in raising the local, regional, and national status and recognition of the Park, despite repeated meddling in management decisions by other government agencies, such as the Departmental Offices for Agriculture, Tourism, and Fisheries. Completion of this phase was made possible with support from the Departmental Director of Agriculture.

**The management plan**

In the last two weeks of February 1989, the Peruvian Foundation for the Conservation of Nature (Fundación Peruana para la Conservación de la Naturaleza, FPCN) sponsored a training course for the group entrusted with the preparation of the management plan (plus two members of the Departmental Agrarian Unit: Juan Castro, Director of Agrarian Economy, and Victor Silva, Director of Natural Resources and Rural Development). The objective of the course was to provide training in national park planning, and, specifically, to obtain an overall understanding of Huascarán's problems.

When the course ended, the officials of the Agrarian Unit and the park employees recognized that it was necessary for the Departmental Agrarian Unit and the Park itself to assume absolute responsibility for formulating the management plan. Technicians and specialists from other institutions could also be included in this
team. The proposal was accepted by the Director of the Departmental Agrarian Unit and the planning team was set up: Juan Castro was appointed director of the team, and Victor Silva assistant director. As the first task of this official planning team, the director established a work plan with two phases: diagnosis of the Park’s problems, and the formulation of the management plan itself. The planning team was composed of 16 professionals and technicians.

The execution of the diagnostic phase faced two great obstacles: budgetary limitations (as insufficient funds were provided by the Ancash Departmental Corporation); and the difficult political situation during 1989/90. Increased subversive activities in the area greatly limited field trips and forced cancellation of some of the workshops with rural communities that had been planned.

The public consultation program

Park officials had always maintained some contact with the local inhabitants, but when preparation of the management plan was begun no thought was given to public participation in this process. Although some preliminary proposals did include meetings with the local population, the proposal for an extensive consultation program came from a student of the College of Environmental Design of Calgary University in Canada. His major objective was to complete his master’s thesis through the application of this program in Huascaran.

In the beginning, the Huascaran National Park Public Consultation Program (Programa de Consulta Publica, PCP) was adopted for the same reasons as many other proposals in our protected areas: the idea had the backing of the Lima office; acceptance of the proposal would generate greater recognition for the Park, since it was an international project (which should therefore be a good one); and the project would help to solve some of the Park’s financial problems for funding elaboration of the management plan. However, due to a poor understanding what the proposal really entailed, along with a lack of organization, the initial agreements did not lead to an appropriate level of coordination between the public consultation program and the elaboration of the management plan.

The Canadian student who was the coordinator of the public consultation program was unfamiliar with the difficulties of national park work in Peru, and was also under pressure due to the deadlines for completing his thesis. He therefore began his work individually, which was helpful in that the park staff gained a better understanding of the proposal, but continuing with the execution of the program aside from this achievement. As the PCP progressed, the reactions of the farming communities (some of them aggressive, others not at all interested) gave cause for great concern and the park administrators discussed the possibility of suspending the program. This reaction, understandable in a group that had endeavored to preserve the Park for over fifteen years without either appropriate technical training or financial resources to visit even their neighboring communities and maintain a
link with them, was later overcome. After some changes in 1989, PCP became the basis for advancing the planning process and was fully identified as an opening-up of the Park toward the community.

Program objectives and strategies

The aim of the first stage (October - November, 1988), was to introduce the community to the process of preparing a management plan for Huascarán National Park and encourage local involvement in this process. Internally, it also sought to strengthen the park personnel's commitment to future development of the plan and defining its scope and stages.

The program had to establish means of communication that could overcome differences in language, culture, geography, and interests between the various groups involved with the Park. The first step was to identify the communities and institutions that should take part in the program. The diversity of users and interests, as well as the Park’s size and geography, reinforced the idea of a much more extensive process of public participation than in the few cases referred to in the literature. The local authorities had to be included, but opportunity also had to be given to the inhabitants in general to express their opinions on the management of an area that had such great influence on their daily lives. It was not enough to involve the numerous local communities; it was also necessary to include the 33 Grass User Committees, who have a relationship with the Park that is fairly distinct from that of the communities.

Lastly, contact had to be made with each town, apart from that of the surrounding rural areas, via important community leaders, schools, church, etc. Finally a map was drawn up locating all the population centers around the Park, all the farming communities, all the grass user committees, and all the institutions at the various locations. Some 400 copies were distributed of a letter that represented the Park’s first formal contact with the community in the management plan preparation process. Special trips were organized to deliver the letter, and in most cases delivery was made by the program coordinator himself, accompanied by a Quechua-speaking guide. Although pressed for time, a conversation was held with each person receiving the letter to ensure that its content and aims were understood. For remote areas, “reliable contacts” were asked to ensure that letters reached their destinations. This involved rural teachers, personal friends, and authorities whose position committed them to fulfilling this obligation of general interest. Since meetings were being held at the same time with rural teachers and grass user committees as part of another project, advantage was taken of these meetings to present the concept for the park management plan and the PCP. The contacts made at these meetings were later very valuable for subsequent PCP stages. This first “presentation” of the management plan and the PCP was accompanied by informal meetings and general initial contacts with a growing number of institutions and individuals, particularly from Huaraz and Lima.
Difficulties

For some people, the letter was not very clear, due mainly to the fact that its main writer was not yet fluent in the language or familiar with the expressions used and understood in rural areas. Also, not enough help was provided by the park personnel who have better knowledge of the local population. Not the most suitable wording was used and the explanation of the aims of the master plan was too simple. In many cases, the "reliable people" did not fulfill their commitment and the letter did not reach all the interested parties. This resulted in a loss of resources, as well as some mistrust in groups that were unaware of the effort made to reach them and therefore felt left out of the process.

Perhaps the main difficulty that the program had to overcome in its first stage was that the rural inhabitants did not identify this initial consultation stage as an effort of the Park as an institution or of its personnel as promoters of the proposal and the opening-up to the community, but only of those who delivered the letter. However, this first stage was important mainly in that it began to create links with the inhabitants and assert the Park’s presence in some institutions.

Survey and inter-institutional team

The aim of the second stage (December 1988 to May 1989), was to ascertain the public’s opinion regarding the points indicated as the most important in making the Park’s management viable and in fulfilling its objectives. This input was to be fundamental in formulating the Park’s first proposal regarding future management.

All the inhabitants and institutions contacted via the first letter were consulted. Inter-institutional work teams were set up to strengthen the participation of the institutions most involved in the Park and to propose concrete management proposals in response to the opinions received.

Strategies

The first step was to define the most important aspects of the present and future state of the Park. Ways were sought for gathering the opinions and positions regarding management of the area of the groups with the greatest influence in the unit, such as the regional office responsible for the control and security of lakes and energy supply (HIDRANDINA), the Ancash Department Farming Community Group (FADA), and the regional office of the Ministry of Industry, Tourism, and Integration (MICTI). The aim of these meetings, most of which were informal, was to explain the scope and purposes of the management plan and to get to know the interests of each sector and any possible incompatibilities with those of the Park.
Three key issues were identified:
- the need to establish an evaluation process for projects proposed for within the Park;
- the need to reorganize the use of the Park’s grasslands and to reach an agreement with the local farming communities on this matter; and
- the need to solve the problem of the Park’s lack of funds.

The survey began in December 1988. A questionnaire was written (and printed with funding from HIDRANDINA). The survey was announced on the radio three times a day for two weeks during the most popular news programs, emphasizing its importance and how to participate. In order to overcome the cultural and language problems that could prevent understanding of the survey, longer meetings were scheduled this time with each survey recipient. Contact was made with rural teachers and trusted community leaders who could read Spanish, and each question was explained to them. Boxes were placed at town halls in the villages and instructions given to the persons in charge of receiving the questionnaires. Posters describing the different stages of the program and the management plan preparation process were also put up.

The questionnaires were collected in January and February 1989 and studied by a group made up of park personnel and students of Huaraz University (UNASAM). A summary of the replies was prepared and distributed widely prior to the next stage of the program. Various inter-institutional teams were organized, each consisting of a park official and representatives of institutions related to the subject to be dealt with. For example, members of FADA, of the grass users committees, MICTI, and the Park, worked on the issue of soil use and the Park’s operating income problems. HIDRANDINA, UNASAM, FADA and the Park formed the group that dealt mainly with the regulations for projects to be executed in the Park. The entire group worked at the park offices during March and April and presented their results in the second half of May 1989.

Difficulties

An obstacle to inter-institutional work was the low level of participation of professionals with experience and training in managing protected areas. Members of some NGOs with experience in range management, as well as members of the National Parks Department at the time, were invited to participate, but unfortunately did not. In the beginning, there were also internal problems. Park personnel and the Agrarian Departmental Unit nearly decided to suspend delivery of the questionnaires for fear that the local communities’ reactions would be unfavorable for the Park. This was due to the lack of clarity of some questions and the use of terminology unfamiliar to the rural inhabitants; concern was expressed that some terms might cause disagreements among the communities. Although this did happen in a few cases, no significant adverse reaction occurred and it seemed that it was mostly the park personnel who misunderstood the questionnaire. Fortunately, the work was
resumed, and the need to deal with the survey proposals compelled park personnel to improve coordination for the program. This was also a clear example of the difficulty of trying to harmonize different positions in the midst of an electoral campaign and social and economic crises that made the political management of organizations (particularly farmer and trade unions) more acute and prevented a clear, independent relationship of the Park administration with the latter.

Conclusions of the program’s second stage

Public participation in the surveys was somewhat low, as measured by the number of replies received. This participation level, however, should be evaluated based on the idiosyncrasies of the local populations, where there is usually very little involvement of citizens and institutions in matters of collective interest. Other important factors were the lack of initiative and the disbelief in governmental organizations. From this standpoint, the participation level was normal and even somewhat higher than in other activities of general interest. The majority of the replies supported the proposal to establish some type of payment scales and other means to improve the Park’s meager income. They also supported the definition of an evaluation system for projects to be developed in the Park. The replies to questions regarding the farming communities showed clear support for changes in pasture use, provided that the Park seriously try to improve the conditions of the communities and reduce problems of erosion.

This stage was vital in the public participation and planning process because park personnel had to publicly face their responsibility for conservation of an area as large as Huascarán National Park. This responsibility, and the consequences deriving from it, had not been fully assumed previously, and silence had been the easiest response to the effort involved in managing the Park in accordance with the area’s development needs. While this stage was in progress, a fundamental change occurred in the Park’s planning process: the Agrarian Unit and the park administration assumed complete responsibility for preparing the management plan and setting up the planning team. This change made management plan work easier and more coherent, while at the same time providing better coordination of the PCP. In addition, a training program provided park members with greater confidence and better knowledge. These changes, together with the support for park conservation proposals that was indicated in the surveys, gave the park personnel a new sense of team spirit and confidence.

The workshops

Community meetings were held in June 1989 to introduce the population to the first management proposals developed by the Park (based on the replies to the questionnaire and the work of the inter-institutional teams). It was also sought to adapt proposals according to opinions expressed at the workshops.
The first part consisted of an environmental education program aimed at communicating the Park’s main problems, beginning with more informal aspects that would help to reduce the tension typical of most meetings between the Park and its users. The second part was the presentation of the preliminary management proposals. Working groups were formed beforehand. One was responsible for designing the educational program and preparing the material. A park official organized transportation for workshop attendees, while others were responsible for defining the presentation of each group of proposals for the Park. Members of the Huaraz mountain-climbing clubs and students of the UNASAM School of Environmental Science aided in the distribution of posters in Huaraz (in other villages and communities they were delivered along with the results of the questionnaires) and placed a banner announcing the event in the City Square of Huaraz. Workshop dates, locations, and objectives were announced on the radio.

In view of the language differences between the recipients and the program, UNASAM students who spoke both Conchucas and Huaylas regional Quechua dialects were asked to participate. This was very useful, since most of the students came from local communities and thus, in addition to the language, understood the idiosyncrasies of the rural inhabitants.

From the start, it was seen that the program would face audiences who were different in every aspect but who all shared a general unawareness of the Park’s role and the importance of the rational management of resources as a basis for sustainable development. In view of this, it was decided to prepare a single program covering the entire range of aspects of the Park. In addition, the program should be very versatile, require a minimum of facilities, and the materials used should be strong and easy to transport.

At the end of the program, there was a puppet show in which the native animals talked about their role in Nature and how some “foreign” species altered their world in such a way that they could no longer survive (and provide benefits to the people). Thinking of possible queries from the local people as to how their interests were related to those of this native flora and fauna, the story introduced some persons who discussed the need to “try out” different management ideas for the area, since perhaps there might be a relationship between the solution to their problems and the benefits that such species could provide.

A scale model was also made showing a small watershed that was extensively deforested on one side while the other side retained its original tree covering. This was used to demonstrate the effects of erosion, or: what happens after heavy rain on both deforested and tree-covered slopes. Then there was a program on the problems of pasture burning, with large graphs showing in comparative form the advantages and disadvantages of development planning considering the environmental variable, and decision-making without taking environmental consequences into account. The
The entire program was presented in both Quechua and Spanish. At the end of the meeting, "chicha y chocho" was served: a corn-based drink and a bean dish, both typical of the mountain region. This encouraged an open atmosphere for discussing ideas and also to deliver a short questionnaire on agreement and/or disagreement with the proposals made.

An initial group of workshops was held with the people of Callejón de Conchucos, and after performing maintenance work on cars and equipment the workshops were held in Huaylas, and lastly in Lima.

**Difficulties**

The workshops were seriously affected by political problems. A few days before the workshops started, the journalist Barbara D'Achille, who was conservation's greatest ally in the press, was assassinated by a terrorist group while visiting a FAO project. This news had a considerable impact in the area and at first it was difficult to obtain FAO trucks for the workshops.

There was also an attack on a police station near the Conchucos villages, and there were reports of narco-terrorist groups taking refuge in the area to escape from army attacks in the cloud forest to the east of Conchucos. The army set up a base in Huaraz, and this, together with the lack of communications to confirm or deny the news from the rural zones, made it necessary to review the work plans and decide whether the workshops continue or not.

At first, the Departmental Agriculture Office was opposed to holding the workshops, probably due to the great responsibility involved in sending personnel to high-risk areas. They asked that the workshops be suspended or, if not, that participants continue at their own risk. It was finally decided to suspend the workshop at the Catac Community, since this zone had then been declared a terrorist area, but to nonetheless hold the remaining workshops (with changes in their schedule, so as to travel only in the daytime), provided the Agrarian Office approved the work.

**Final stage of the public consultation program**

The research and development plan (which guided the second phase of the management plan preparation) comprised the organization and execution of three public consultation workshops. The first two aimed at achieving a consensus on park zoning, and were planned for March 1990 (one at Conchucos and the other at Huaylas). The third workshop (May 1990) would endeavor to harmonize park management conflicts by submitting the management programs proposed in the plan to consultation. Unfortunately, these three workshops could not be held, for lack of funding. It was only at the end of May, when the draft management plan was already completed, that funds were made available, and they were therefore used for the Scientific Cooperation Workshop Seminar, which was held in June 1990 and was the only public consultation workshop in the plan's second stage.
The seminar’s objectives were:
- To present the preliminary version of the second part of Huascaran National Park’s master plan to public and private institutions, authorities, conservation professionals, local leaders, and park users in general.
- To enrich and better orient management proposals through the active participation of the above groups.
- To identify conservation, research, and community development projects, as well as possible funding sources, with the participation of the local inhabitants.

In the mornings, conservation and development were discussed, followed by a presentation of the different parts of the management plan. In the afternoons, groups worked on the most important points discussed earlier. In the late afternoons and evenings, conservation-related videos and slides were shown. At the same time, there was an exhibition of the maps made during the planning process, which helped people to understand the issues dealt with. There was also an exhibition relating to the projects presented in the management plan and the Park’s great wealth of flora, fauna, and landscapes. The moderator was experienced in working with poor farmers. A plenary session was held at which the proposals of each work group were discussed; and lastly, the planning team held evaluations.

The workshop was attended by 113 people, including regional authorities, local communities, grass use committees, the National University, Educational Services Units, travel agencies, tour guide associations, the Huaraz Archeological Museum, non-governmental conservationist organizations, the Peru National Parks Program, etc. In addition, some international conservation specialists, who were unable to travel to the area (since some embassies and technical cooperations restricted trips to the area due to terrorist problems) passed along their suggestions. The workshop participants contributed 14 projects and activities, 11 norms for a “community eco-development zone” (zona de ecodesarrollo comunal, which includes the communities surrounding the Park), and 14 projects and activities for the “recreation zones” and “primitive zones” (zonas de recreación and zonas primitivas).

Final comments

The public consultation program of Huascaran National Park has had the broadest participation in the history of Peru’s protected areas. One of the most outstanding features of this process is the strong orientation towards training park personnel as a fundamental step for institutional strengthening and continuity of conservation efforts. The management plan and the public consultation process perhaps could have been completed in less time, but this would have meant losing the opportunity to train the personnel to develop a clear understanding of the planning process and the steps to be followed in executing the actions of the plan. Another very important aspect is that the management plan gives priority to actions
intended to stimulate development of the communities surrounding the Park, as an “ecodevelopment zone”, which is the only way to guarantee the welfare of the population and the conservation of the Park. The diagnosis leading to this proposal was possible basically due to the direct exchange with these communities and local institutions during the public consultation process.

Although Huascaran National Park’s problems still remain, the execution of the public consultation program has significantly enhanced the Park’s image in the eyes of the national and local community and has made park personnel more confident. These two results have served to elucidate a path toward reaching mutual agreements in dealing with all the different interests concerning the Park. International cooperation should increase its contribution to South American protected areas in fields that lead to greater involvement of local communities in the planning and management of such areas and in training their officials. These aspects are fundamental in guaranteeing effective management of protected areas so that they may play their part in development based on the sustainable use of resources.

Prior to the public consultation program and the preparation of the management plan, Huascaran National Park was considered one of the weakest units in Peru’s National Conservation Unit System. After two years of technical support, with financial resources to work in the area surrounding the Park, training, and an initial impulse to their activities, the park personnel demonstrated that it is indeed possible to conserve and manage protected areas in harmony with the local communities, as a basis for their development.

Editorial update: In 1990, the management plan for Huascaran National Park (PNH) was officially approved. Since then, the policy of an “open” administration has continued with great success. The positive relationship with the Regional Government and the establishment of a Technical Advisory Board (Comité Técnico Asesor) have proved to be fundamental for the administration of the Park and were responsible for effective park management. Despite the financial and technical negligence of the parks administration in Lima (SINANPE office) and the lack of interest on the part of private nature conservation organizations, the PNH project has become one of the major development promoters of the area. The main management achievements of the Park until present include the training of personnel and technicians, and the implementation of the Public Use and Communal Ecodevelopment Program (Programa de Uso Público y de Ecodesarrollo Comunal). Nevertheless, long-term management of the Park (and the Biosphere Reserve that it is part of) are strongly affected by the continuing changes in the central SINANPE office and by lack of funds, which made drastic reductions in personnel necessary (pers. com. M. Torres, 1994).
References


Legal documents

Constitution of Peru (*Constitución Política del Perú*),

Decree Law 21,147, Forestry and Wildlife Law (*Ley Forestal y de Fauna Silvestre*),

Civil Code (*Código Civil*),

Environment and Natural Resources Code (*Código del Medio Ambiente y los Recursos Naturales*),

Supreme Code 160-77-AG, Conservation Unit Regulations (*Reglamento de Unidades de Conservación*),

Decree Law Nº 22,175 on Native Communities and Agrarian Development (*Ley de Comunidades Nativas y de Desarrollo Agrario de la Selva y Ceja de Selva*),

Law Nº 24,657 on Demarcation and Ownership of Farming Communities (*Ley de Deslinde y Titulación de Comunidades Campesinas*).
Suriname. Photos 56/57: The Indian village of Kwamalasamoetoe lies in southern Suriname, on the Sipaliwini River. Its inhabitants, the Tirio Indians (and especially their children) like to keep pets like this infant spider monkey (Ateles paniscus). Unfortunately, these pets often receive improper care and die young.
Suriname. Photos 58/59: The long beaches in the Galibi Nature Reserve, in the northeast corner of Suriname, are of great importance as nesting sites for several species of marine turtles. A Leatherback Turtle (Dermochelys coriacea) returns to sea after nesting (below).
Suriname

Managing protected areas
Muriel M. Held
Henri A. Reichart

Legal aspects of protected areas
Ferdinand L.J. Baal

The relationship between people and parks in Galibi and Brownsberg
Henri A. Reichart

Bigi Pan Multiple-Use Management Area
Muriel M. Held
Managing protected areas in Suriname

Muriel M. Held
Henri A. Reichart

Abstract: Suriname is a relatively small but ecologically significant country with extensive, uninterrupted tropical rainforest cover (almost 90% of its area) and a very low deforestation rate (less than 0.1% annually). The Forest Service, within the Ministry of Natural Resources, is in charge of the protection, control, and management of all forests on state-owned lands, including the protected areas. In 1969, the Foundation for Nature Preservation in Suriname (STINASU) was established to support the Forest Service in its nature conservation activities. A network of 13 nature reserves and one nature park has been established and part of the estuarine zone in Bigi Pan is managed as a multiple-use management area. Most protected areas are on state-owned land; some however, are located near regions where human activities (such as agriculture) take place, or where tribal people claim traditional rights for hunting, fishing, and gathering. With special provisions included in the resolutions of the most recent nature reserves, the Government has acknowledged the needs and aspirations of these indigenous communities.

Relatively small, and with a practically uninhabited and undisturbed interior of neotropical Amazonian rainforest, the Republic of Suriname lies on the northeast edge of South America between 2° and 6° north latitude and 54° and 58° west longitude. The country has a total land area of 164,000 km², of which some 90% is covered by forest (Anon., 1988). Suriname is of a certain global importance, since its percentage of uninterrupted tropical forest cover is among the highest in the world and the rate of destruction is less than 0.1% annually.

An estimated 388,000 people live in the country, the majority of which (about 85%) is concentrated in and near the capital of Paramaribo and in the small communities on the coastal plain. Almost all of the economic activities in the country take place in the northern, populated part of the country (mostly within 30 km of the capital), the most important being bauxite mining and processing, agriculture, and timber production (Werkhoven/Held, 1989). The southern part of the country is uninhabited except for some scattered settlements of Amerindians and 'hushnegroes' (descendants of runaway slaves) along the three major rivers, the Marowijne, the Suriname, and the Corantijn River. For their survival, these tribal peoples depend on the use of their local natural resources: hunting, fishing, and shifting agriculture.

Suriname has a tropical climate with an average temperature of 27.1°C. The highest temperatures (28.2°C) are measured in September and October, and the lowest (26.2°C) in January and February. There are two dry seasons: a major one...
from August to November, and a minor one from February to April. Annual rainfall varies between 1,750 and 3,000 mm, and high humidity prevails throughout the year (Mittermeier et al., 1990).

Geologically, Suriname may be divided into a northern, lowland coastal region and a southern, more mountainous region. The lowlands contain three ecological regions: the Current Coastal Plain, the Ancient Coastal Plain, and the Zanderij Formation, all running the entire width of the country to the north of the Guianan Shield. The Current Coastal Plain (between the coastline and 4 m above sea level) consists of marine sediments from the Holocene and is characterized by sand and shell ridges, alternating with swamps on heavy clay. Along the coast, the banks of the estuaries are often covered with mangroves. The Ancient Coastal Plain (about 4 -11 m above sea level) consists mainly of marine sediments that were deposited during the Pleistocene interglacial periods. Elevated clay flats, remnants of old sandy ridges, and extensive swampy areas are characteristic landscape elements. Mesophytic or marsh forests, as well as savannas and savanna forests, are to be found on the old ridges, while the terraces of the clay flats are dominated by mesophytic forests or wet clay savannas of the Welgelegen-type; swamp forests are characteristic for the gullies. The Zanderij Formation or Savanna Belt lies on well-drained, quartz-rich sand sediments that are about 30 m above sea level. Its climax vegetation is formed by mesophytic forests; on bleached soils there are also high or low xerophytic savanna forests.

The southern mountainous region rises gradually from the Zanderij Formation and ranges in elevation generally between 300 and 1,230 m. This region consists almost entirely of Precambrian rock formations and is part of the Guianan Shield, which developed from the weathering and erosion of the former trans-Amazonian mountain range. About one billion years ago, after the shield area sank, it was covered by a thick layer of sediments which eroded almost completely after a subsequent epeirogenic uplift. Known as the Roraima formation, it is widespread in Guyana, Venezuela, and Brazil. In Suriname, however, it is only found on the 1,026 m high Mt. Tafelberg, situated in the center of the country. During the Tertiary (some 2-65 million years ago), most of the country was submitted to intensive erosion and chemical weathering; laterite and bauxite crusts developed at various locations that protected the underlying soil against erosion, allowing plateaus such as Brownsberg (514 m) to develop. In other places, however, underlying hard dolerite sills were uncovered (e.g. van Asch van Wijck Gebergte, 240 m), as well as some parts of the granite base (e.g. the Voltzberg, 240 m) in the Raleighvallen-Voltzberg Nature Reserve (Reichart, 1993).

The region is covered with Amazonian tropical rainforest ecosystems and some isolated savannas, the largest of which (100,000 ha) is the Sipaliwini Savanna at the south border of Suriname, connected with the large Paru Savanna in Brazil. Considering the species richness of its flora and fauna and several ecosystems characteristic of the Guianan Region, the practically undisturbed interior of Suriname is of great scientific value. Due to their inaccessibility, these ecosystems are well-
preserved and constitute a sound reservoir of genetic diversity for numerous neotropical species: approximately 4,500 plants, 150 mammals, 674 birds, 156 reptiles, 103 amphibians, 300 freshwater fish, 50 brackish water fish, as well as an unknown number of marine fish and invertebrates (Werkhoven / Held, 1989). As the southern part of Suriname gets more explored, these numbers will undoubtedly increase even more.

The coastal areas of Suriname, which differ greatly from the clear-water recreational beaches in other parts of the Caribbean, have their own attraction. The birdlife, especially in the extensive coastal mangrove forests with their high biological productivity, is incredibly rich, and the sea turtle nesting populations can be considered well-protected and healthy.

**Protected areas**

Protection of natural areas is part of the overall resource development strategy of the Government. The Suriname Forest Service (Dienst’s Lands Bosbeheer, LBB) of the Ministry of Natural Resources (Ministerie van Natuurlijke Hulpbronnen) is, among others, entrusted with the development and management of the country’s protected areas. LBB is being assisted in this by the Foundation for Nature Preservation in Suriname (Stichting Natuurbehoud Suriname, STINASU).

In 1954, the Nature Preservation Law (Natuurbeschermingswet) was enacted, providing the Government with the means to establish natural areas of special importance by declaring them as nature reserves. At that time, nature conservation research consisted primarily of collecting samples of flora and fauna, and accumulating basic information on ecosystems. Although these studies were far from complete, the Government was convinced of the importance of the findings and felt justified in developing a network of protected areas. This was accomplished by setting aside state-owned land as nature reserves before human-caused destruction of ecosystems could take place. The general strategy was to protect large ecosystems in order to conserve a maximum of biological diversity, instead of opting for a larger number of small areas.

As a first phase, nine nature reserves and one nature park were declared during the years 1961 to 1972; most of them located in remote parts of the country. The second phase was the period after Suriname’s independence from the Netherlands in 1975. The need was felt to preserve interesting natural areas in the lowland region of the country where the population, and therefore human pressure on the ecosystems, was higher. A 3-year survey (1976 to 1978) and mapping program of Suriname lowland ecosystems was conducted by Teunissen (1978). Based on these data and other ecological information, four new nature reserves, located in the Ancient Coastal Plain and the Savanna Belt, were declared in 1986. In addition, in 1987, part of the estuarine zone in Bigi Pan was put at the disposal of the Ministry of Natural Resources, to be managed as a multiple-use management area. Two more
Map 1

Suriname: existing and proposed protected areas (1990)

- Existing protected areas:
  - Nature park
  - Nature reserve
  - Multiple-use management area

- Proposed protected areas:
  - Forest reserve
  - Nature reserve
  - Multiple-use management area

Legend:
- Game Law Resolution Boundary
nature reserves and two forest reserves still await legal recognition, as well as the remainder of the country’s estuarine zone, which should receive the status of multiple-use management area. Currently, protected areas cover 803,970 ha or 4.9% of the country; when the other proposed protected areas are declared, about 6.9% of Suriname’s territory will have protected status. A Conservation Action Plan for Suriname (CAPS) has been prepared by WWF-US, the Suriname Ministry of Natural Resources, and STINASU. This plan outlines the immediate conservation needs of the country over a five-year period starting in 1990 (Mittermeier et al., 1990).

Most protected areas are on state-owned land; some, however, are located in regions where tribal people claim traditional rights for hunting, fishing, and gathering. Initially, in its quest to preserve wild habitats, the Government did not give much consideration to the interests of tribal people. Despite this, Government decisions have generally been respected, largely due to the low population pressure.
and the existence of sufficient land outside of protected areas for tribal use. Besides, LBB and STINASU have always tried to maintain a good relationship with the inhabitants of local villages. Where possible, workers for the reserves and parks were hired from these villages, and the local people were allowed to enter the protected areas for subsistence use of natural resources and performance of cultural activities. Hunting, however, was prohibited (except for the Amerindians in the Galibi Nature Reserve) and local dwellers have to comply with the regulations on fishing and logging (Reichart, 1992).

Currently, the development strategy of the Government acknowledges that, for a successful management of protected areas, attention must be paid to the traditions and needs of indigenous communities. Before the recent nature reserves were declared in 1984, meetings were held with the local people, that have resulted in special provisions in the Government resolutions for these nature reserves, safeguarding traditional rights to make use of the protected areas as long as activities do not interfere with the goals of these protected areas.

**The symbiosis between the Suriname Forest Service and STINASU**

Conservation needs of developing countries can often not be met because of budgetary constraints. It is almost axiomatic (also in developed nations) that conservation is the last activity to be funded in good times and the first to be cut in bad times. Many government agencies in the developing world view their natural resources as a commodity to be exploited as much as possible in an effort to emulate the standard of living of the more affluent countries. It is therefore common that decision-makers give priority to exploitation schemes that provide relatively quick economic benefits. Environmental considerations receive only token attention, and their long-term consequences are largely ignored.

In Suriname, there is a good awareness of environmental issues, not just in official rhetoric, but also in actions. Although a few decision-makers have some knowledge of ecological principles, they cannot be expected to understand either the intricacies of various ecological functions, or the long-term consequences of human activities on natural ecosystems. But they must be made aware of the need for environmental impact analysis in economic development projects. Ecologists or resource managers should be assigned to the advisory boards of such projects.

The Government of Suriname controls all forests on public land in the country. This encompasses an area of about 14,800,000 ha. The Ministry of Natural Resources is responsible for policy direction, legislation, issuance of permits, budget allocation, and inter-ministerial coordination. The Forest Service (LBB) within this Ministry, is in charge of the protection, control, and management of forest resources. In 1963, the Nature Conservation Division was created within LBB to manage protected areas and wildlife, with the objectives of: implementing the nature conservation laws, conducting ecological research, and carrying out environmental education and public awareness programs. Nature tourism was promoted as
a source of funds for nature conservation activities. For budgetary reasons, nature tourism was delegated to the semi-governmental STINASU, which was established in June 1969 with the support of the Government in order to circumvent the usual bureaucracy of governmental agencies, and thus facilitate the implementation of environmentally sound projects.

STINASU was not only given the responsibility to develop concepts for nature tourism and apply them, but also to promote environmental education and scientific research in cooperation with LBB. One of its major tasks is to impart a conservation ethic to the public which could prevent the use of potentially destructive environmental practices. This is done by carrying out programs for all educational levels, like, for instance, the creation of a Wildlife Rangers Club for young people, and the production of nature films that are now regularly shown at primary and secondary schools. Articles about conservation are prepared for local newspapers, and nature-oriented films have become a regular feature on Suriname television. These programs have borne fruit, and Suriname is now one of the most conservation-minded nations in South America.

STINASU cooperates closely with LBB and also receives a government subsidy—not in cash, but in personnel and logistics. Limited funds are available for basic nature conservation studies and part of STINASU’s income derives from eco-tourism, and the sale of T-shirts, nature posters, and postcards. Funding for larger projects is obtained from WWF-Netherlands, WWF-US, Conservation International, and the Canadian Government. The growing interest in tropical forest resources has prompted LBB and STINASU to encourage foreign researchers to enter into cooperative agreements and come to Suriname to work on research projects of national, regional, and international importance.

Since 1983, permits have been issued by LBB with a minimum of bureaucracy, facilitating research judged to be important for conservation, and field assistants, guides, and transport have been provided at low cost. Working in Suriname under the auspices of LBB and STINASU has the added benefit of increased cooperation from other Suriname agencies, and it also provides the ability to move about freely. The mutual benefits from a cooperative program between these national conservation organizations and foreign institutions are many. From Suriname’s point of view, several benefits are derived:
- basic field data is obtained that facilitates future resource management decisions;
- skills in particular fieldwork techniques are enhanced; and
- Suriname students and fieldworkers are provided with an opportunity to learn from the direct contact with foreign researchers.

In order to obtain maximum benefit for the country, LBB and STINASU make the following requirements of researchers:
- If animal or plant specimens are collected, a representative series of specimens must be prepared and donated to LBB/STINASU in order to build up the collections at appropriate Suriname institutions.
- Specimens taken out of Suriname must be made available to other interested researchers.
- Several copies of all publications resulting from the work done in Suriname must be provided free of charge for distribution to pertinent Suriname institutions.
- When requested to do so by LBB/STINASU, the foreign researchers must take Surinamese counterparts along on field trips and instruct them in current field techniques.

The Suriname cooperative program has been in operation for a number of years. Participants have come from the Smithsonian Institution, the American Museum of Natural History, Carnegie Museum of Natural History, as well as from several universities in the USA and the Netherlands. A number of foreign students have done fieldwork for graduate degrees in Suriname.

Suriname also has an international reputation of excellence in marine turtle conservation. LBB has delegated the responsibility of management of the four species nesting in Suriname to STINASU. For about 25 years, STINASU field-workers and LBB game wardens have patrolled the beaches to ensure maximum nesting protection for these species. Poaching is almost non-existent. Suriname does some of its own research, but for foreign research on sea turtles the same concept of cooperation prevails. Researchers are welcome to do fieldwork, and permits are provided with a minimum of bureaucracy, as long as the resulting studies are of benefit to marine turtle conservation.

In summary, Suriname, because of the unique symbiosis between LBB and STINASU has created field research conditions for international scientists unparalleled in South America. In return, it requires that efforts be made by the visitors to impart as much of their knowledge as possible to Suriname and the international community. The Suriname Cooperative Agreement could serve as a model on which other countries could promote their own conservation research needs. The stigma of abuse that past foreign researchers may have left in some places should not deter developing countries to set up such a program. There is much know-how and talent in the affluent countries, and much of this can be transferred through a cooperative field research program.

Editorial update: Within the framework of the World Conservation Strategy, LBB and the National Planning Bureau are preparing the reference for a Multiple Year Forestry Development Plan. This so-called “Bosplan” will contain guidelines and project proposals for short-term (five years) implementation, and will propose a strategy for long-term (20 years) development. The “Bosplan” will be based on the Tropical Forestry Action Plan (TFAP), and include activities in the area of land-use, forest-based industry, conservation, and institution-building. Suriname will submit a formal request to the Food and Agricultural Organization (FAO) for assistance to draft this plan (pers. com. M.M. Held and H.A. Reichart, 1994).
Legal aspects of protected areas in Suriname

Ferdinand L.J. Baal

Abstract: There are several laws in Suriname that contain mechanisms for the creation of protected areas. At present, the most important of these is the Nature Preservation Law; in the near future, the Law on Forest Management will be the basis for protecting forests. Most national laws on protected areas contain requirements to respect the traditional rights and interests of the indigenous people. Suriname also participates in several international, regional, and bilateral agreements, and maintains contact with foreign institutions. The cooperation of these organizations is needed in the implementation of the Conservation Action Plan for Suriname.

Before 1953, there were no protected areas in Suriname, and the wildlife was hunted and captured almost without restrictions. Now, there are several laws and institutions dealing with the management and protection of the urban, rural, and natural environments. Legislation concerning the management of wildlife and protected areas in Suriname started with a provision in Article 44 of the Penal Code of 1915 (*Politiestrafwet*, as updated in 1942). This article requires a permit of the Director of the Ministry of Natural Resources (*Ministerie van Natuurlijke Hulpbronnen*) in order to hunt or to capture wildlife in certain areas of the country, which thereby became protected areas.

The first sanctuary was established on 15 February 1953 by Government Resolution (Government Bulletin 1953 No. 12, with reference to Article 44) to protect breeding colonies of water birds, especially the Scarlet ibis (*Eudocimus ruber*). This area became the Coppenamemonding Nature Reserve as a result of the Nature Preservation Resolution (*Natuurbeschermingsbesluiten*) of 1969.

Nature Reserves and the traditional rights of indigenous people

In 1948, the Nature Conservation Commission (*Natuurbeschermingscommissie*) was established by Government Resolution in order to study conservation problems, and to propose relevant legislation. The resulting Game Law (Government Bulletin 1954 No. 25) and Nature Preservation Law (*Natuurbeschermingswet*, Government Bulletin 1954 No. 26) were published in 1954. Article 2 of the latter Law, when translated into English, reads as follows: "To be designated as a nature reserve, the area has to satisfy the following requirements: that it deserves protection by the Government because of its varied nature and scenic beauty and/or because of the
presence of (from a scientifically or culturally significant point of view) important flora, fauna, or geological objects.” This definition may cover several internationally accepted categories of protected areas, such as:
- Strict Nature Reserves, which are closed to visitors.
- National Parks, which are large and open to the public.
- Managed Reserves, which receive active management of their natural resources;
- Protected Landscapes, which safeguard scenic values.

Article 3 assigns the management of nature reserves to the Head of the Forest Service (Hoofd van ‘s Lands Bosbeheer), who is advised by the Nature Conservation Commission. This Commission is composed of government officials and other persons appointed by the President. Management of the reserves is carried out by the Nature Conservation Division of the Forest Service (Dienst’s Lands Bosbeheer).

Article 5 states the activities that are prohibited in nature reserves, including hunting, capturing of wildlife, or carrying of fire arms. Article 7 provides for the commercial use of natural resources (e.g., forest products, fish, or forage for cattle) within reserves when certain conditions are complied with.

Based on the Nature Preservation Law, 13 nature reserves have been established by resolutions passed in 1966, 1969, 1972, and 1986. These resolutions indicate the boundaries of the reserves and explain existing proprietary rights, leases, concessions, or permits on parcels of land within the reserves that should be respected.

The Resolution of 1986 includes a provision for the “traditional rights” and interests of indigenous people living in tribal communities. Its “Note of Explanation” states that during the selection process for some of the nature reserves it was not possible to avoid areas where communities were already established. Therefore, prior to declaring these reserves, the Forest Service consulted with the Board of the KANO (an association of tribal Amerindians in Suriname), with local village committees, and affected individuals. These meetings resulted in an agreement that indigenous people living in tribal communities would be able to maintain their traditional rights inside the nature reserves that were about to be established, provided that:
- the national objectives of the proposed nature reserves are not endangered;
- the motives for these “traditional rights” and interests still exist; and
- these rights and interests are limited to the period of time required for consolidation of all inhabitants of Suriname into a unified citizenry.

The Note refers to the Map of Lowland Ecosystems in Suriname (Teunissen, 1978) and to recommendations for the expansion of the system of protected areas in the lowlands of Suriname (Teunissen et al., 1979). According to Teunissen et al. these “traditional rights” include: free choice in the location of villages and shifting agricultural fields; hunting and fish rights; and the right to apply for logging permits.

The Note refers to these activities are only allowed on public lands which have not yet been formally allocated to third parties. They are further limited by traditional and cultural norms, and by national laws on hunting, fishing, and forest utilization. The
reserve managers should ask for the advise of local village chiefs concerning management activities, and the Head of the Forest Service should consult general management matters with the village committees and the Nature Conservation Commission. In case of a dispute, the local District Commissioner may be consulted.

The Timber Law

About 90% of Suriname is covered with forests, which constitute an important renewable natural resource. The Forest Bureau (Dienst van het Boswezen), which existed from 1904 to 1925, conducted botanical surveys, and established trial plots on several soil types, but was dissolved because of the approaching worldwide economic depression of the 1930's. By Resolution 2,824 of July 1947 (G.B.1947, No.108), the Forest Service was established to sustainably manage the nation's forests.

Based on Article 26 of the Timber Resolution (Houtbesluit, 1947), the Forest Service is authorized to control the activities of concession holders, and to enforce the regulations of the Timber Law (Houtwet, 1947). According to Article 1, the President is authorized to issue specific logging permits, as well as timber concessions on State land. The holders of these permits or concessions are required to respect the rights of 'bushnegroes' and Amerindians that live within the areas assigned to them. The President may also issue logging permits (houtkapvergunningen) to these tribal groups, under conditions to be set by Government Resolution, which may differ from those mentioned in this Law (Article 5). About 250,000 ha have been allocated to the Forest Service as reserves, and for reforestation, research and training. In addition, two areas in western Suriname with a total of 10,000 ha have been proposed as Forest Reserves.

New categories of protected areas

The proposed new Law on Forest Management (Concept-Ontwerp Wet Bosbeheer) will replace several of the existing laws (the Timber Law of 1947, the Laws G.B.1947 No.181, and G.B.1973 No.162, as well as the Timber Export Law, G.B.1950 No.1) after enactment by the Parliament, and its publication in the Government Bulletin. The new law will provide a framework for forest management, exploitation, and related activities (e.g. primary processing and export) to guarantee sustainable utilization of the forest resource.

In this law, 'forest' is defined as all land with trees, shrubs, and other vegetation, that is suitable for the production of timber or secondary forest products, or yielding other benefits, such as soil protection, maintenance of the environmental stability, or the recreation possibilities. In addition, it includes land that has been reforested or
which (in the opinion of the Minister) may be devoted in the future to these purposes. ‘Forest’ does not include cleared land that is used for agriculture, mining, construction, permanent settlements, or other non-forestry uses that have been recognized by a national or regional development program (as provided for by the Planning Law); and areas protected under the Nature Preservation Law.

The new law (Article 1) divides forest areas into the following categories according to the uses to be made of them: “Permanent Forest”, “Conversion Forest”, and “Provisionally Maintained Forest”. The fourth category, “Community Forest”, may consist of one or more of the above-mentioned categories. The management objectives for each category (or sub-category) are the following:

- **Permanent Forest (Blijvend Bos):** forest which must be maintained for sustainable timber harvest, the sustainable collection of secondary forest products, or for the maintenance of any ecological, protective, or recreational function. Permanent Forests are classified into three sub-categories:
  - Permanent Production Forest (Blijvend Produktiebos): is designated primarily for a sustainable and efficient timber harvest or sustainable production of secondary forest products.
  - Protection Forest (Schermbos): has an important stabilizing effect on the natural environment, especially on the soil and the watershed, due to its strategic location.
  - Specially Protected Forest (Speciaal Beschermd Bos): has a special scientific, educational, cultural, or recreational function, due to its location, flora and fauna, or aesthetic value.

- **Conversion Forest (Eenmalig Leeg Te Kappen Bos):** forest to be cleared in areas where the land will be used for a different purpose than forestry.

- **Provisionally Maintained Forest (Voorlopig In Stand Te Houden Bos):** forest which must be maintained as such, awaiting its final designation as either Permanent Forest or Conversion Forest.

- **Community Forest (Gemeenschapsbos):** forest areas around the community lands of indigenous people who live in tribal communities. These forests provide a variety of products for local use. They could possibly also be used for the production of secondary forest products, commercial logging operations, or be cleared for agricultural purposes.

According to the Law, no concessions or permits for forestry exploration may be issued for Protection Forests or in Specially Protected Forests. Further regulations may limit or rule out timber harvest or any other human activity within these two sub-categories (Articles 5, 16). The clearing or exploitation of Provisionally Maintained Forest is forbidden; also when it is part of a Community Forest (Art. 8). The categories Protection Forest, Specially Protected Forest, and Provisionally Maintained Forest in the proposed Law on Forest Management can therefore be considered as true protected areas.
Laws on the allocation of state-owned lands

Nature parks and multiple-use management areas may be created under the 1937 Agrarian Law (Agrarische Wet), which was updated in 1982 and replaced for the most part by a set of 5 laws, including Law L-1 on Principles of Land Policy (Decreet L-1, Decreet Beginselen Grondbeleid) and Law L-2 on the Allocation of State-owned Lands (Decreet L-2, Decreet Uitgifte Domeingrond).

According to the 1937 Law, the President has the power to make decisions concerning state-owned lands, taking into consideration the general laws and the legal rights and interests of third parties, making special reference to bushnegros and Amerindians (now Law L-1, Article 4): “When deciding over state-owned lands, the rights of bushnegros and Amerindians living in tribal communities, in their villages, settlements and shifting cultivation grounds, are to be respected so far as they do not conflict with the common interest of the country.”

Brownsberg Nature Park (established 1969 according to the 1937 Law) is on state-owned land which was allocated to the Foundation for Nature Preservation in Suriname (Stichting Natuurbehoud Suriname, STINASU) on a long-term lease basis (erfpacht). Since then, STINASU has managed this area according to the international category of a National Park.

The Bigi Pan Multiple-Use Management Area (established 1987 on the basis of Law L-2 of 1982) is state-owned land which was put at the disposal (ter beschikkingstelling) of the Ministry of Natural Resources, and its management is coordinated by the Forest Service.

The Bigi Pan Area is the first protected area in Suriname which goes beyond the lowtide line and extends to where the ocean is 6 meters deep. In 1990, with the assistance of the Canadian Wildlife Service, a management plan was drafted which has been approved by the Board of Ministers of Suriname.

The Planning Law and Special Management Areas

The Planning Law (Planwet) of 1973 provides for the possibility to assign the following land-use categories within the national development programs: Development Areas (Ontwikkelingsgebieden), Residential Areas (Woongebieden), and Special Management Areas (Bijzondere Beheersgebieden).

In 1976, several international experts recommended to include Suriname’s entire estuarine zone (including the Bigi Pan Multiple-Use Management Area) in the category of a Special Management Area (Schulz, 1976). However, since not all agencies dealing with the execution of this law have been established, the Planning Law is not yet operational.
Protected areas due to international agreements

In 1985, the Republic of Suriname became a Signatory Party to the Washington Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Western Hemisphere Convention). According to Article II of the Convention, the contracting Governments will explore the possibility of establishing in their territories national parks, national reserves, natural monuments, and strict wilderness reserves. As explained before, the definition of the Suriname "nature reserve" covers several internationally accepted categories of protected areas, thus satisfying the demands of the Convention.

In the same year, Suriname became a Party to the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention). Following Article 2, Paragraph 4 of this Convention, Suriname designated the Coppenamomonding Nature Reserve for inclusion in the List of Wetlands of International Importance. Possibly other such protected wetlands in Suriname will be declared.

During a dedication ceremony in 1989 at the Forest Service Headquarters in Paramaribo, the Coppenamomonding Nature Reserve, the Wia Wia Nature Reserve, and the Bigi Pani Multiple-Use Management Area were officially established as "Hemispheric Reserves" within the Western Hemisphere Shorebird Reserve Network (now called "Wetlands for the Americas"). On the same occasion, these three protected areas were declared "sister reserves" of two protected areas in the Bay of Fundy in Canada, which are used by the same flyway population of Nearctic shorebirds that winter along the coast of Suriname (Spaans, 1989). The reserves' "sisterhood" was the result of the Memorandum of Understanding of 1987, concerning cooperation in the field of conservation between the Canadian Wildlife Service and the Suriname Forest Service (Spaans / Baal, 1990).

Within the framework of the Special Commission on the Environment of the Amazonian Cooperation Treaty, Suriname participates in the activities of the protected areas program. Co-operation in the field of conservation is also possible on the basis of existing bilateral cooperative agreements with Brazil, Guyana, and Venezuela.

Conclusion and recommendations

Although the establishment of protected areas in Suriname started as late as 1953, there are at present 15 protected areas covering 4.9% of the land surface. Several proposed areas await official Government approval. Assistance from international and foreign organizations is needed to implement the activities mentioned in the Conservation Action Plan for Suriname, for example the management of existing protected areas, and the establishment of new protected areas in the interior (Guianan Shield region).
There are several legal mechanisms for creation of protected areas, respecting the traditional rights and interests of indigenous people in the planning stages and daily management. It is desirable, however, to evaluate the national laws on protected areas with the goal of improving on the definitions, and to streamlining them for compliance with the internationally accepted definitions of categories.

Editorial update: The new forest legislation (Wet bosbeheer) has meanwhile been ratified by the Suriname Parliament. This law sets rules with regard to the management of the natural environment and resource exploitation, giving specific definitions for various land-use classifications. It dictates that forest exploitation, for whatever purpose, must be based on sustainable yield management (pers. com. M.M. Held and H.A. Reichart, 1994).
The relationship between people and parks in Galibi and Brownsberg

Henri A. Reichart

Abstract: Most of Suriname's nature reserves are in remote and isolated parts of the country where few or no people live. There are, however, some protected areas near human settlements, where conflicts have arisen, or may arise in the near future. Two of these problem areas are presented in this paper: the Galibi Nature Reserve, where Amerindians claim their traditional rights to use natural resources, especially the harvest of sea turtle eggs; and the Brownsberg Nature Park, where resettled bush negroes of the Saramaca tribe, displaced by a hydro-electric project, live near the Park and have caused degradation of the environment due to agriculture and hunting. Continued human pressure may spill over into the Park unless the needs and aspirations of the local people are channeled in a more constructive manner.

The Galibi Nature Reserve

Surveys conducted in the 1960s discovered that the beaches surrounding the mouth of the Marowijne River, on the border between Suriname and French Guiana, are a focal point for nesting females of three species of sea turtle: the Green Turtle (Chelonia mydas), the Leatherback Turtle (Dermochelys coriacea), and the Olive Ridley Turtle (Lepidochelys olivacea). Because of the endangered status of these species worldwide, and the unique opportunity to protect their nesting sites, it was proposed to consolidate these Suriname beaches into a sea turtle sanctuary. This resulted in 1969 in the declaration of the Galibi Nature Reserve (Natuurreservaat). The Reserve gets its name from the ancient (and no longer existing) Amerindian village of Galibi that was located there. The term 'Galibi' is now used to indicate the general area of the northeast corner of Suriname (see Figure 1).

Amerindians have lived in Galibi since pre-columbian days. The land with its resources is considered to have been received from their ancestors; it is to be used by the current generation, which is also expected to maintain sound stewardship over the land to ensure its use for generations to come. This is the basic tenet of "traditional rights", as the tribal communities see it.

There are no permanent human settlements within the boundaries of the Galibi Nature Reserve, and the surrounding region is only sparsely inhabited. Near the southern border of the Reserve, however, there are some 2,000 Amerindians living in two adjoining villages: Christiaankondre and Langamankondre. These people are of Carib descent, and their villages are jointly known as 'Galibi'.
The local Amerindians have always used, and continue to use, the Galibi area for subsistence hunting, fishing, and gathering of plant materials - the latter being mainly for fuel and the construction of dwellings. Agriculture is also carried out in the area, mostly through shifting cultivation, although some permanent gardens are located on the more fertile alluvial soils of the Reserve.

Implicit in the design of a nature reserve is usually the assumption that the area will be protected from all resource exploitation. The 1960s and 1970s were decades when many nature reserves were declared throughout the world. In those days, a number of them were established with total disregard for the needs and aspirations of indigenous people living in, or near, these areas. In virtually all such cases, those people, when deprived of the use of "their land", suffered economic hardship, or at best, received only marginal benefit from the presence of the protected areas. This usually resulted in antagonistic attitudes towards the nearby reserves, culminating in rampant poaching of its flora and fauna. Suriname has not entirely avoided making the same mistake, and the clearest case of this is that of the Galibi Nature Reserve.

The primary purpose of the Galibi Nature Reserve is the protection of marine turtles and their nesting beaches. As such, the beach areas should remain inviolate, but the utilization of some resources does not necessarily have to be excluded (Bubberman, 1970). Therefore, in what at the time must have been a rather enlightened attitude, the Suriname Government decided to allow the limited use of the Reserve by indigenous people to continue (Anon., 1977, 1978).

Conservationists acknowledged that, because of the low human population density in the area, certain activities would be sustainable and that these should not endanger the goals of the Reserve. However, some problems arose that, if left unresolved, could seriously affect the future of the Reserve. The most important one concerns the uncontrolled harvest of marine turtle eggs by the Amerindians.

Prior to the plans to make the area a nature reserve, several meetings were held between village representatives and government officials in order to exchange views on the need to protect the marine turtles and their nesting beaches.

The subject that always surfaced was that the local Caribs consider the area to be their property and claim "traditional rights" to do with it as they please. Although they never used the area extensively, they did not like the idea of the Government excluding, or even limiting, their access. The major stumbling block in the discussions was their concern that they would no longer be allowed to harvest the marine turtle eggs for which they had developed a lucrative market.

During each nesting season (approximately February-May), the Caribs harvested as many eggs as they could possibly dig up. These were not used for local consumption, but instead were transported to other communities for sale to the public. Consequently, they saw the establishment of the Reserve as the potential loss of a source of income.
In 1967, when the need to protect the marine turtles and their nesting beaches at Galibi became evident, government officials met with representatives of the Amerindian villages in order to explain the rationale for doing so. The excessive harvest of turtle eggs, especially the almost 100% harvest of Olive Ridley eggs, would have to be stopped if the nesting populations were to survive (Schulz, 1975).

Although there were some dissenting voices, the majority of the villagers could see the beneficial aspects, and they agreed to cooperate. Instead of harvesting, the Caribs would now be paid to locate and, where needed, transfer the eggs to safer locations. The Amerindians, however, were under the impression that the measures would be in effect for 1967 and not necessarily for subsequent years. When, in 1969, they were confronted with the fact that the Galibi area had become a nature reserve, they felt threatened, and the grumbling started. Through a series of misunderstandings they felt that they were even prevented from using the area for other subsistence activities. Although the latter was found to be erroneous, it caused antagonism and resistance towards the Reserve (Kloos, 1975).

Although Amerindians may have deep-rooted reservations about some issues, they do not easily voice direct objections to outsiders; these are often couched in ambiguous agreements with the other party, later argued about among themselves and with their chiefs (Kapiteins). Had the government responsible been more aware of this aspect of Carib culture, many, if not all, of the problems could probably have been resolved amicably at that time.

After negotiations had concluded, the permanent inhabitants of the nearby Carib villages were allowed to continue the following activities in the Reserve:
- building of temporary camps or shelters;
- cultivation of existing agricultural plots;
- subsistence hunting and fishing; and
- collecting plant material for utensils, buildings, and fuel.

These activities would only be allowed as long as they did not conflict with the purposes of the Reserve, as stated in the articles of the Nature Preservation Law (Natuurbeschermingswet; Baal, 1991). In spite of these concessions, the villagers did not cease their opposition to the Reserve.

Eventually, through additional negotiations between villagers and government officials (Anon., 1984), a compromise was reached on the harvest of marine turtle eggs. The rationale was based on the fact that the beaches in Suriname are constantly being built up in some places and eroded in others, and this erosion by the sea results in the destruction of about 25% of the eggs that are laid. In addition, many of the nests are laid below the high waterline and will be flooded, and thus destroyed, by subsequent spring tides. Based on this information, a total harvest of about 250,000 green turtle eggs in 'endangered' sites was allowed per year. To control this harvest, the Foundation for Nature Preservation in Suriname (Stichting Natuurbehoud Suriname, STINASU) was designated as the agency to implement this
scheme under the auspices of the Suriname Forest Service (*Dienst's Lands Bosbeheer*, LBB). As part of their "traditional rights", the Galibi Amerindians harvested the permitted eggs and transported them up the Marowijne River to the town of Albina. This was done under the supervision of STINASU, who also paid for this work and arranged for further transport and sale of the eggs in Paramaribo and other areas. From the proceeds of the sale of the eggs, STINASU contributed to the Galibi village treasury.

For a while this arrangement seemed to work well, but grumbling among the Caribs continued. Consequently, during the 1980s, more meetings were held between representatives from the villages and government officials. As a result, the Caribs became gradually more involved in the harvest and sale of the eggs. Further negotiations, held in 1990, resulted in an agreement that the Amerindians would not only organize the harvest of the eggs on the Galibi beaches, but also arrange for their transport to Paramaribo. The subsequent sale would be done through STINASU on behalf of the Galibi Villages Foundation. This has not worked out well, and the management authority of LBB was largely ignored. In fact, in mid-1990, the villagers seized the Reserve and ousted LBB/STINASU personnel stationed there. Obviously, the situation was not good, either for the Amerindians or for the turtles. Marine turtle conservation on these internationally important beaches was suffering and the problems had to be resolved.

Local Amerindians have always considered the Galibi area as their communal property, and they are protective of their assumed rights to use the area for their subsistence activities. Most of them seem to believe that the natural resources supporting them are inexhaustible. In fact, some believe that the modern concept of conservation is a threat to their existence. Many villagers have good practical knowledge about Nature and do not intentionally degrade their environment. Because of their (self-imposed) isolation, however, they fail to see the long-term consequences of overexploitation and environmental degradation.

Traditional resource use practices often contain sound conservation principles, but in many cases this is not so. For instance, contrary to the assertion of the Amerindians that their turtle egg collecting would not adversely affect the Olive Ridleys, data accumulated over the past years clearly show a sharp decline in numbers, and it would have caused rapid extinction of the population if no controls had been put in place. In fact, the Olive Ridley nesting population may already have gone below the "point of no return", from which it can no longer recover (Reichart, 1989, 1992).

Traditional rights of indigenous people should by no means be ignored or be rejected off-hand. If government and village representatives negotiate in good faith, a compromise for mutual benefit, can usually be worked out. Regarding the Galibi Nature Reserve, however, the Caribs have not been part of the decision-making process. They were talked to, not talked with. They were confronted with the Reserve as a *fait accompli*, something anybody would resent. It is time to correct the errors.
of the past; local communities should become partners in (at least) some aspects of
the management of the Reserve.

However, the proclamation of a nature reserve is a national commitment to
conservation on a global scale, and as such, it supersedes ancient or self-proclaimed
rights of small groups. The Galibi Amerindians cannot isolate themselves from
these national and international goals, and claims of rights to uncontrolled exploita-
tion of resources are to be looked at carefully. It should be understood that the
Reserve is primarily intended to protect marine turtles and, when properly managed,
at the same time provide the Caribs with a means for sustainable use of this
resource. Because of its international importance, and the need to apply modern
techniques, management of the Galibi area cannot be left in the hands of the local
people alone.

In Galibi, a clean start must be made. Representatives from pertinent govern-
ment agencies, non-governmental organizations (NGOs), and villages should work
together in developing a mutually acceptable course of action in the management of
the Reserve. Local people will have to be consulted as much as possible in the
decision-making process, and be included in the Reserve’s workforce.

The Galibi Nature Reserve is not yet in the mainstream of nature tourism, but
the potential is there. Though relatively remote from Paramaribo from a logistical
point of view, the Reserve nevertheless has good potential for the expansion of
tourism. The turtle beaches in French Guiana, directly across the Marowijne River
from the Galibi Nature Reserve, are visited year-around by French tourists. The
Galibi Nature Reserve, however, is a more interesting and varied place to visit; the
beaches are larger, more pristine, and more private. But it will require international
promotion to focus attention on the attractions that Galibi has to offer. A pre-
requisite to growth in nature tourism is the improvement of access to the Reserve, as
well as in infrastructure. Here too, local communities could derive socio-economic
benefits (Reichart, 1992).

The Brownsberg Nature Park

In 1969, part of the Brownsberg Ridge was leased to STINASU, a semi-
governmental conservation organization. Instead of making the area a state-run
nature reserve, it was felt that a somewhat more autonomous agency would be better
equipped to develop the area for research, environmental education, and nature
tourism. Most of these goals have been realized, and the Brownsberg Nature Park
has become the most popular nature recreation area in the country and the site of
various research projects.

The Park is located about 130 km south of the capital city of Paramaribo and
comprises the northern part of the 500-m-high Brownsberg Ridge which runs more
or less parallel to the west side of the Brokopondo Reservoir. This reservoir was
created by damming the Suriname River at the village of Afobaka to provide hydroelectric power for the bauxite refinery plant of the Suriname Aluminum Company (SURALCO).

Most of the northeastern part of Suriname is inhabited by bushnegroes who are descendants of escaped slaves. These people are grouped in several distinct tribes, and their villages are traditionally located along rivers. The section of the Suriname River Valley that was flooded consisted of almost half of the territory held by the Saramacca tribe since it was ceded to them by the Dutch colonial government through a peace treaty in 1762. There were about 6,000 people settled in a number of villages, and the construction of the dam initiated on-going social upheaval among these bushnegroes.

Several of the villages were flooded by the reservoir, and about 2,000 people decided to move to sites prepared for them at the north end of the reservoir, while others moved farther south into the interior. Although the Government and SURALCO made attempts to mitigate the problems associated with the movement of the bushnegroes villages, it is now evident that the villagers were ill-prepared for the coming changes in their lives. A survey done in 1975 among affected people revealed a general disappointment with the way things were handled. Some felt that the Government had failed in its duty to explain the situation, and to provide viable alternatives, and others claimed outright that they had been cheated (Franszoon, 1976).

The Brownsberg Nature Park is located close to several of these relocated villages, which are known under the collective name of Brownsweg. There is some antagonistic behavior toward the presence of the Park, but it is remarkably minimal, when viewed in the light of how the people felt they had been treated. It is therefore imperative that a good relationship be nurtured with the villagers if both they and the country are to benefit from the presence of the Park.

Discussion

Prior to the flooding of the Suriname River Valley, the local bushnegroes used the Brownsberg for subsistence hunting. In fact, part of the motivation of some to move to the sites at Brownsweg was to be closer to their hunting area. But with hunting prohibited in the Park, part of their traditional hunting grounds would no longer be available to them. Hunting pressure around the Park is heavy and as a result most game species are scarce. Although there are some encroachments into the Park (mostly logging and hunting), they are minor, in view of the local people’s poverty and the rate of degradation of the surrounding lands. Wildlife is still relatively abundant in the higher reaches of the Park, but poaching in the lower parts of the Park (which are more accessible to villagers) is becoming a problem. So far, the people have shown a remarkable tolerance to the Park, but as the surrounding lands continue to deteriorate, pressure on the Park will no doubt increase, and it may only be a matter of time before the Park’s resources are also exhausted.
For too long, conservation and rural development have been considered as being mutually exclusive. In almost all countries, protected areas have been set aside with little concern for the local people. And so it was with the Brownsberg Nature Park. It was leased to STINASU with no consideration being given to the nearby villagers. The Park now appears to be an isolated remnant of tropical rainforest surrounded by an impoverished landscape.

Not so many years ago, however, the entire region looked much like the Park does today. Excessive and uncontrolled resource use by the displaced Saramaccaners have degraded the land outside the Park. In such an environment, and as long as the needs and aspirations of indigenous people are ignored, the Park will not be able to maintain its integrity for long.

A land use plan for the Pokigron-Brownsweg area has been prepared (Playfair, 1985) and the Brownsberg Nature Park Management Plan will be an integral part of the proposed development for the area (Reichart, 1991).

General recommendations

Planning a protected area in isolation from its surroundings is a mistake. To be effective, a park’s management plan has to be an integral part of a regional land use plan, or at the very least, should be implemented in cooperation with local community leaders. For this, joint workgroups charged with developing greater cooperation with the villagers should be established. The work groups should especially promote the concept of agro-forestry and other sustainable activities to be carried out in the protected areas’ buffer zones. The overall strategy should be to work together with the villagers, and not present them with already formulated projects.

In a cooperative effort between LBB, STINASU, and village leaders, an environmental awareness program should be designed to explain the functions of local ecosystems. This can foster a greater understanding of environmental issues. Emphasis must be placed on the consequences of overexploitation and environmental degradation by using real-life examples. Many villagers have good practical knowledge about Nature and they do not degrade their environment willfully, but they often do not comprehend the long-term consequences of overexploitation. Much work needs to be done to explain the ramifications of excessive resource use. The program should also aim at explaining the justification for the protected area, and how the parks can be of economic benefit to the villages in the long run (e.g., income from tourism, sale of handicraft).

Teaching environmental awareness to local people, however, is a sensitive issue. Patronizing attitudes of instructors can be counterproductive. Many community leaders are intelligent people and are quite knowledgeable about the local environment. Therefore, the format of the program should take the form of discussion groups where ecological concepts and park management issues are brought up. Such an interchange of information can be mutually beneficial.
As an added public relations effort, groups of local villagers (especially young people) should be invited to visit the parks as guests of STINASU, LBB, or other organizations. Nature films, slide shows, and guided nature walks go a long way in obtaining appreciation and support for the parks.

The benefits derived from living near protected areas can be divided between direct and indirect benefits. Direct benefits include: employment in the parks, sale of local handicrafts to tourists, work as guides for fishing and hiking trips, and transport and lodging of tourists. No less important, the indirect benefits involve: the parks’ function as a reservoir of wildlife that can be hunted outside the park boundaries, survival of healthy populations of plants with traditional medicinal uses, community forestry in the parks’ buffer zones, maintenance of watersheds that provide clean water downstream, and resource management guaranteeing long-term profit. Community participation in the management of protected areas could take several forms, to be considered by STINASU, other organizations, and local community leaders:

- the establishment of village liaison committees to deal with matters of mutual concern and interest;
- concessions for provision of services to tourists (e.g. transport, restaurant, lodging, and maintenance of roads and other facilities);
- joint efforts to develop sustainable use projects in the parks’ buffer zones; and
- the development of environmental awareness education programs, in cooperation with the village committees.

In Suriname, recent discussions with village leaders on these subjects have shown promise for their success, and proposals are currently being initiated to get some of the suggested projects started.

Editorial update: In February 1993, after the armed conflict between the army and rebel forces had ended, the area of the Galibi Nature Reserve became accessible again, and new negotiations were undertaken between the Caribs and government officials. This time, the Caribs were much more receptive to the return of a government management team to the Reserve, but they insisted on greater participation in the marine turtle egg harvest and in tourism to the area. On both counts, the Carib and governmental negotiators reached an accord, and there is reason to believe that the management of the Galibi Nature Reserve will resume with the cooperation of the local communities (pers. com. H.A. Reichart, 1994).
Bigi Pan Multiple-Use Management Area

Muriel M. Held

Abstract: The Bigi Pan Multiple-Use Management Area (established in 1987) is located in the northwestern part of the inter-tidal zone of Suriname. Rice farming, pesticide use, and uncontrolled hunting and fishing present serious threats to the important natural functions of the area. Proper management, including the search for alternative income sources and environmental education, could benefit local people, as well as the country in the long run, by enabling the area to maintain its outstanding ecological functions.

The inter-tidal zone of Suriname reaches its greatest width (about 15 km) in the western part of the country (Anon., 1976). It consists of various coastal ecosystems and, like all tidal zones, it has a high biological productivity. The Bigi Pan protected area is located in the northwestern part of the inter-tidal zone, between 5°55' north latitude and 56°45' west longitude, in the districts of Nickerie and Coronie. It is named after the Bigi Pan Lagoon and includes the inter-tidal zone of Nickerie and the adjacent northern part of the Coronie Swamp. The entire area comprises about 68,300 ha, including fresh and brackish water ecosystems, as well as marine waters. As is characteristic for tropical inter-tidal ecosystems, the vegetation is dominated by mangroves in all stages of succession. Biological productivity manifests itself particularly in the high numbers of fish and invertebrates. Several species of marine fish and shrimp spawn in the area (Resida, 1985).

Suriname’s coast is very important for aquatic birds, both nationally and internationally. Aerial surveys have shown that over 40% of the Surinamese population of Scarlet ibis (Eudocimus ruber), averaging about 40,000 pairs (as well as other birds of the order Ciconiiformes) occur in the Bigi Pan area. Thousands of shorebirds, especially Semipalmated sandpipers (Calidris pusilla), winter in the area or at least stop there during their migrations to and from the North American Arctic Region (de Jong et al., 1984).

Agriculture, mainly rice farming, is the most important economic activity in the Nickerie and Coronie Districts, which threaten inter-tidal ecosystems through illegal occupation of land, withdrawal of freshwater, and excessive use of pesticides. An added threat is the removal of sand from some beaches. A 25-km stretch of road goes through the Coronie Swamp and has for years acted as a dike, preventing the northward flow of fresh water and the southward intrusion of tidal waters. During 1988 and 1989, culverts were installed to allow for the interchange of these waters (Anon., 1990).
Realizing the importance of Bigi Pan and the Coronie Swamp for fisheries, protection of the coastline, nature tourism, beekeeping, and assurance of sustainable resource use, the Suriname Government placed the area under the jurisdiction of the Ministry of Natural Resources, to be managed as a multiple-use management area (Ministerial Decree of 30 December 1987).

**Discussion**

The population of Nickerie District, where most of the multiple-use management area is located, is concentrated in the north (95% of its 32,690 inhabitants). According to the Suriname Plan Atlas (Anon., 1988), this is a very densely populated area for Suriname. The natural resources of the area (especially those of terrestrial and freshwater ecosystems) are heavily exploited and illegal land occupation is a big problem. In Nickerie District, 58,857 ha is dedicated to rice farming, and 650 ha to bananas. In Coronie District, a mere 1,320 ha is cultivated for rice, and does not represent a threat to the Bigi Pan Multiple-Use Management Area.

During the country’s colonial period, sugar cane was the main crop in Nickerie District. With the settlement of Dutch farmers, and the establishment of the Foundation for Mechanized Agriculture (Stichting Machinale Landbouw, SML) in 1950, large areas of the inter-tidal zone of the district were transformed into rice fields, because of their swampy nature and their fertile, young clays. In addition to the SML, private landowners also started to grow rice, and expand their holdings, both legally and illegally. No attention was paid to the ecological functions of the area or to the damage to these essential functions that would, in the long, result from uncontrolled agricultural activities.

In 1974, plans were made to transform large parts of the inter-tidal zone of Suriname into rice fields. Being alarmed by this news, biologists of several institutions recommended dividing Suriname’s entire coastal area into ecologically defined blocks, in order to promote its more optimal use (Anon., 1976). Proposals were made to declare the area a multiple-use management area.

Since the Planning Law (Planwet of 1973), intended to be the legal instrument to establish the protected area, is not yet in force, and to prevent that inappropriate resource use or illegal occupancy interfere with the proposed plans, the Government decided to make use of a Ministerial Decree. So, on December 1987, the part of the inter-tidal zone, where human pressure on the environment was the highest, was placed in the hands of the Ministry of Natural Resources to be managed as a multiple-use management area.

Several strategies were formulated to promote effective management for the area. A management plan was developed for the period of 1990-1994, with priority placed on the clear demarcation of the area’s boundaries. This was primarily aimed at preventing the illegal establishment of new rice fields within the area.
Suriname. Photos 60/61: In central Suriname, granite outcroppings ("inselbergs") are typical features of the landscape. One of these, the Voltzberg Dome (above), is a main attraction of the Raleighvallen-Voltzberg Nature Reserve. Kakikasima Mountain, located between the Boven Tapanahoni and Palumeu Rivers, reaches a height of 718 m and has never been climbed.
Guided by the slogan "Nature preservation is self preservation", the activities of the semi-governmental Foundation for Nature Preservation in Suriname (STINASU) are directed toward the greater understanding of wildland resources and their sustainable use, focusing on scientific research, environmental education, and nature-oriented tourism.
Recommendations

Some of the problems facing the Bigi Pan Area are of a legal nature. Although the protected area was declared in a Ministerial Decree, this could easily be superseded by other legal instruments of higher status. Furthermore, water management authorities, which are fundamental to the management of the area, officially belong to another institution. Therefore, the legal status of the protected area will have to be strengthened, and the law concerning the water management of the Bigi Pan Multiple-Use Management Area be amended.

The SML land concessions extend from the town of Wageningen to the coast. Although no plans exist for developing the area near the sea, the SML is legally entitled to use this land for its own purposes. Attempts should be made to return the management of this part of its concession to the Government.

In order to achieve sustainable use of the area and successful implementation of the management plan, all relevant ministries and the general public must be involved in this process. Although the interests of the people who depend on the area were taken into greater consideration when establishing the Bigi Pan Area than most times in the past, and the need for management of the area was explained to them extensively, public knowledge and understanding of the ecological and economic importance of the protected area should nevertheless be promoted even more. Educational programs aimed at the local people (fishermen, farmers, hunters, students) are currently in the planning stage, and should be carried out as soon as possible.

Although the Multiple-Use Management Area has been placed under the jurisdiction of the Ministry of Natural Resources, the cooperation and assistance of several other agencies are required. The other ministries involved are: the Ministry of Agriculture, Animal Husbandry and Fisheries; the Ministry of Public Works; and the Ministry of Regional Development. An Area Advisory Committee, including representatives of these ministries, must be established to facilitate and coordinate the management of the area.
References

Anon. (1976): Instelling Byzonder Beheersgebied Estuarien Kuststrook, een nota over de
bestemming van de zoute en brakke kuststrook in Suriname op oecologische grondslag.
Anon. (1977): Bespreking van Kommissie Ontwikkeling Galibi (KOG) met vertegen-
Anon. (1978): Verslag van een Bespreking te Galibi (Langamankondre en Christiaankondre)
van "KANO"-LBB-Vertegenwoordigers en de bewoners van Galibi t.a.v. het Natuur-
Marowijne, Politiekorps Albina, de Voorzitter van de Distrikstraad Marowijne d.d. 24
Anon. (1988): Suriname Planatlas. Department of Regional Development, Organization of
American States, Washington, D.C.
Anon. (1990): Bigi Pan Multiple Use Management Area, Management Plan. Environment
Canada, Canadian Wildlife Service and Ministry of Natural Resources, Suriname Forest
Service. 32pp. Paramaribo.
Baal, F.L. (1991): Legal Aspects of Protected Areas in Suriname. IV World Congress on
National Parks and Protected Areas. 30p. Caracas, Venezuela.
Department of the Environment of Canada & Ministry of Natural Resources and Energy of
Franszoon, A. (1976): A preliminary Investigation of Social Conditions in Suriname's Trans-
migration Villages, presented to the Suriname Aluminum Company. 15p. Paramaribo.
Case Study of the Cooperation between Research and National Conservation Needs. In:
Mammalian Biology in South America, M.A. Mares and H.H. Genoways. Pymatuning
Held, M.M. / M. Playfair (1990) Conservation and Exploitation of the Suriname Tropical
Rainforest (a paper submitted for the 2nd Regional Congress on Environment, Cayenne,
the IWRB / ICBP Neotropical Wetlands Project. RIN Contributions to Research on


Uruguay

In search of an appropriate protected areas system

Stephan Amend
Thora Amend
Uruguay: in search of an appropriate protected areas system

Stephan Amend
Thora Amend

Abstract: The great magnitude and intensity of agricultural and livestock activities has seriously affected Uruguay's wildlife, and many species having suffered the impacts of habitat alteration. The protected natural areas administered by the State should play an important part in the effort to halt or at least slow down this process. While Uruguay's particular situation (with a considerable proportion of the land under private ownership) makes it very difficult to establish a system of protected areas, several institutions are seeking solutions to protect the country's natural and cultural heritage. In 1991, a team from the Planning and Budget Bureau (OPP) presented a plan for the selection of wilderness areas of interest for protection and identified 36 areas, some of which already have some status as protected areas.

The Republic of Uruguay is situated between 30° and 35° S latitude and 53° and 58° W longitude. It has an approximate total area of 177,000 km² and is bordered on the east by the Atlantic Ocean, on the south by the La Plata River, on the west by the Uruguay River and Argentina, and on the north by Brazil. The great majority of Uruguay's inhabitants are of Spanish and Italian descent. The proportion of black people is extremely small, and Indians disappeared from the country over a century ago. The country presently has an estimated population of over 3,100,000, of whom some 1.4 million inhabit the capital, Montevideo. The percentage of population classified as urban (88.2% in 1985) is the highest in all of Latin America (StBA, 1990).

The environment is that of a transition zone between the pampas of Argentina and the mountains of southern Brazil. Uruguay has low or gently rolling terrain, with a series of elevations of crystalline structure called "cuchillas", 200 to 500 m in height. The highest peaks are Cerro de las Animas (501 m above sea level), and Cerro Catedral in the CArrapé Range (513 m; Chebataroff, 1984). Although there are no great heights, the relief is complicated by the series of secondary forms, caused mainly by fluvial erosion. The climate of Uruguay is temperate, with maritime influence and no extremes of heat or cold. Mean annual temperatures range from 17°C in winter to 23°C in summer. Rainfall is abundant, particularly in spring and autumn; frost and fog are frequent in winter. The prevailing winds blow damp and warm from the north, or cold and dry from the southwest (pampa winds).
Uruguay has about 450 km of coastline along the La Plata River estuary, as well as about 220 km of coastline against the open ocean. A large part of the coast consists of rocky points alternating with the halfmoon-shaped sandy beaches that lie between them. The Atlantic coast is more regular than the La Plata River coast; the former is liable to flooding in some places, and there are numerous lagoons and large stretches of marshland.

In the interior of the country, prairie-type vegetation prevails (grasslands and sometimes relatively low shrubs) and trees only grow along watercourses or in valleys. The vegetation reflects the importance of livestock in Uruguay: almost 77% of the country's total area is devoted to grazing, chiefly cattle and sheep, while only about 8% is used for agriculture, mainly wheat and rice. The most important export products are wool, wheat, meat, and hides (see Table 1).

The great magnitude and intensity of agricultural and livestock activities has seriously affected Uruguay's wildlife and numerous species have suffered the impacts of habitat alteration. This is evident from the number of species that are classified as endangered or have even been displaced from the country: approximately 18% of the mammal species and 10% of the birds are endangered or on the way to extinction (Oltremari / Nebel, 1988). In the effort to halt or at least retard this process, the protected natural areas under State administration play an important part.

Protected areas and inhabitants

Almost all the areas in Uruguay that are officially protected, either by law or by decree, belong to the State. There are 16 protected areas (see Table 2), designated from 1915 on in a relatively continuous process, which reached its height in the 1960s, when nearly 40% of the areas were established. However, only six of the officially protected areas are recognized in the United Nations list (IUCN, 1990); four being classified as Category V (protected landscapes), one as Category IV (wildlife sanctuary), and one as Category III (natural monument). Parts of the Atlantic coast were declared wetlands of worldwide importance under the Ramsar Convention, ratified by Uruguay in 1984, and also declared a Biosphere Reserve in 1986.

Since land in protected areas is property of the State, the majority of such areas have no inhabitants. One exception is Valle del Arroyo Lunarejo, a provincial protected area. Part of this area is privately owned and the remainder is administered by the National Settlement Institute (Instituto Nacional de Colonización) and thus has inhabitants within its boundaries. Another exception is Las Dunas Natural Monument on the Atlantic coast, with recent squatters. More or less all the protected areas are close to population centers of varying sizes, due to factors such as the absence of topographical barriers and easy access to all parts of the country (Sans, 1989).
A critical analysis of the Uruguayan protected areas has indicated some of their more common limitations and problems (Oltremari / Nebel, 1988):

- Presence of plantations of rapidly growing exotic species (mainly pine and eucalyptus), due to various circumstances in the past. One of the reasons for this was the need to control the advance of the coastal dunes, and another was the desire to create a recreational and tourist attraction. Indeed, the artificial woods in some parks allow for camping and picnicking. In other cases, the plantations are valuable collections of live exotic trees, which provide important educational opportunities.

- Management overly oriented toward tourism and recreation. A large proportion of protected areas, national parks in particular, are being developed through actions to “improve the aesthetics” of the landscape, with a view to contributing to the development of tourism, especially in areas that receive large numbers of foreign and domestic tourists. In some cases, this is detrimental to the maintenance of resources still in a wild state or with little human disturbance.

- Unclear competence and competition among various institutions. Although the Forestry Bureau (Dirección Forestal) administers over 60% of the protected lands, there are other state agencies with similar purposes. These include some municipal intendancies, the office of the President of the Republic (Presidencia de la República), the Fauna Division (División Fauna, like the Forestry Bureau belonging to the Ministry of Livestock, Agriculture and Fishing, Ministerio de Ganadería, Agricultura y Pesca), and the Army’s Park Service (Servicio de Parques del Ejército), which administers the country’s two best-known national parks. Some institutions even possess more than one dependency with jurisdiction over protected areas.

- Areas of insufficient size to fulfill certain management objectives. Some reserves and parks have poorly defined or inappropriate boundaries that hinder
Map 1

Uruguay: designated and proposed protected areas

- Designated protected area
- Proposed protected area
- Bañados del Este wetlands (No. 16)
<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Protected Areas</th>
<th>Location (Department)</th>
<th>Area in ha</th>
<th>Year created</th>
<th>IUCN Categ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parque F.D. Roosevelt</td>
<td>Canelones</td>
<td>1,500</td>
<td>1915</td>
<td>V</td>
</tr>
<tr>
<td>2</td>
<td>Bosque Fiscal Islas del Río Uruguay</td>
<td>Paysandú, Río Negro</td>
<td>6,600</td>
<td>1921</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Parque Nacional San Miguel*</td>
<td>Rocha</td>
<td>1,986</td>
<td>1927</td>
<td>V</td>
</tr>
<tr>
<td>4</td>
<td>Parque Nacional Santa Teresa*</td>
<td>Rocha</td>
<td>3,000</td>
<td>1927</td>
<td>V</td>
</tr>
<tr>
<td>5</td>
<td>Palmares de Castillos (Laguna Negra)*</td>
<td>Rocha</td>
<td>5,000</td>
<td>1939</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Parque Bartolomé Hidalgo</td>
<td>Soriano</td>
<td>200</td>
<td>1946</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Arboretum de Lasich</td>
<td>Maldonado</td>
<td>300</td>
<td>1963</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Parque Arequito</td>
<td>Lavalleja</td>
<td>1,000</td>
<td>1964</td>
<td>V</td>
</tr>
<tr>
<td>9</td>
<td>Refugio de Fauna Laguna de Castillos*</td>
<td>Rocha</td>
<td>8,008</td>
<td>1966</td>
<td>IV</td>
</tr>
<tr>
<td>10</td>
<td>Monumento Natural de Dunas y Costa Atlántica*</td>
<td>Rocha</td>
<td>1,000</td>
<td>1966</td>
<td>III</td>
</tr>
<tr>
<td>11</td>
<td>Reserva Forestal de Cabo Polonio y Aguas Dulces*</td>
<td>Rocha</td>
<td>3,000</td>
<td>1969</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Bosque Nacional Islas del Río Negro</td>
<td>Río Negro, Soriano</td>
<td>1,850</td>
<td>1969</td>
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<td>Estancia Carlos Reytes</td>
<td>Durazno</td>
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</tbody>
</table>

* Areas included in the 1991 OPP/OEA/BID study
their development. In general, the units are not large enough to accomplish long-term nature conservation.

- Poor representation of some of the country's natural environments. Although several units contain coastal habitats, there are many types of environment that are not well represented in the protected areas, in particular the country's few remaining relatively pristine forests, marshlands, lakes, and natural prairies. These habitats in the northern part of the country should be included in the system in some way.

**Selection of areas for a national protected areas system**

In 1990, the Planning and Budget Office (Oficina de Planeamiento y Presupuesto, OPP), with the support of the Organization of American States (OAS) and the Interamerican Development Bank (IDB) carried out a project for the selection of wilderness areas in order to establish a national system of protected areas. The final document states the following:

"Exploration of natural areas of potential interest for conservation is the initial stage in the development of a strategy to create a national protected natural areas system. This exploratory phase takes into account, in a very general manner, the representation of the country's different regions and the areas' most outstanding values. On completion of this process, selection of the most important areas will commence based on their representativity and the current state of their resources. This selection leads to a priority classification of areas that will first be integrated into the system. This phase requires detailed study of the areas, which may serve as a basis for the subsequent formulation of management plans. The development strategy should be guided by clear conservation objectives on the national level, since these are useful in making a better selection of the areas" (OPP / OAS / IDB, 1991).

The experts who worked on this study considered that Uruguay has completed the first stage of the national inventory of wilderness areas with the studies of A. Laffite (1980), the Ministry of Livestock, Agriculture, and Fishing (Ministerio de Ganadería, Agricultura y Pesca, 1987), J. Oltremari and J.P. Nebel (1988), and C. Alho (1990), the latter forming part of the National Environmental Study Project. The team identified 36 areas of interest for protection, some of which already have some degree of protection (Map 1, Table 2). From the described areas, 16 were selected and analyzed in greater detail. The following selection criteria were used:

- representation of the different types of vegetation and wildlife existing in the country,
- habitats of migratory birds,
- species diversity,
- presence of endemic species,
- historical or cultural value.
features of geological interest,
- scenic beauty,
- sufficient size (to allow for viable populations of the species being protected),
- conservation state, and
- present use of the area (OPP / OAS / IDB, 1991).

Due to the study’s objective of proposing new protected areas, the investigation did not include areas for which management plans are presently being formulated, or have already been established, or areas in which management is already performed more or less efficiently. Additionally, many ecologically interesting areas had been substantially altered by Man and therefore did not qualify for designation as wilderness areas. Of such areas, only Santa Teresa National Park and Cabo Polonio Forestry Reserve (Reserva Forestal) were included, since they are located in a region with special characteristics due to its historical and natural values. The general analysis of the selected areas also revealed the following legal information:
- units 8, 9, and 11-14 were established by law or national decree, and only unit 15 by municipal decree;
- in all cases, except 8 and 9, there is no definition of specific boundaries, hence their total surface area is unknown;
- units 10 and 16-23 have no type of legal protection and the land is privately owned; and
- the entire area of unit 23 and 25% of unit 17 are the property of the National Settlement Institute (Instituto Nacional de Colonización).

The team members identified several problems common to most of the selected areas:
- poaching,
- incorrect management for conservation purposes,
- cutting of native woodlands,
- land use conflicts in the core zone and neighboring areas,
- lack of a master plan for the areas already established, and
- insufficient scientific information on the natural resources present in the selected areas, often preventing the protected area from being accurately characterized and making it necessary to extrapolate regional data.

The best-known aspects are those relating to geology, soils and climate. The flora has also been relatively well studied, but there is little information on the fauna, due to the lack of inventories in all the areas (OPP / OAS / IDB, 1991).

Environmental education pilot project

The first attempt in Uruguay to achieve integration of Man with Nature in the rural environment, and local participation in the planning process, was carried out in the Valle del Arroyo Lunarejo area, which had previously been identified as an area of interest to be included in a future national protected natural areas system.
Although its management category had not yet been established and there was no management plan, the National Settlement Institute (INC) decided to carry out a pilot project of environmental education at Colonia Aparicio Saravia, located in Valle del Arroyo Lunarejo. This valley is situated in Rivera Province in the north of the country and has an area of approximately 15,000 ha. The INC is the state agency in charge of the expropriation of land and the settlement of rural inhabitants. Created by Law No. 11,029 dated January 12, 1948, its basic objective is defined as follows: "For the purposes of this law, settlement is understood to mean all actions to be taken hereunder to promote the rational subdivision and proper exploitation of the land, with a view to achieving increased and improved agricultural production and the settlement and well-being of the rural population."

In Aparicio Saravia, the standard of living and form of land tenure, in which each settler (even if he owns the land) is subject to administration by the INC with respect to use of resources and land allocation, made it possible for INC to act freely in the entire zone of Valle del Arroyo Lunarejo that belongs to the settlement. The goal of the project was to achieve protected area planning with the acceptance and participation of the settlers from the very start (Bertulli / Nieto, 1989). The project's strategy was based on the following points:
- Local meetings with the settlers and the community's formal and informal leaders (technicians, schoolteachers, directors, and other local authorities) to explain the importance of, and reasons for, a protected area and the conservation of the area's natural resources.
- Educational activities in the settlement and visits to the protected area with experts in the different subjects (flora, fauna, etc.).

These actions were to be carried out in a coordinated manner between the National Settlement Institute, branches of the Ministry of Agriculture and Fishing (Forestry Bureau, Fauna Division), the Colleges of Agriculture and of Veterinary Science, the Rivera Provincial Government, the Botanical Garden, and the Natural History Museum. The expected results of this environmental education pilot project are:
- involvement of the community in the planning and management of the protected area;
- protection of native forests, wildlife, and watersheds;
- analysis of the problems that prevent greater integration of the local community in the protected area (Bertulli / Nieto, 1989).

Conclusions

Although Uruguay's particular situation makes it very difficult to set up a protected areas system, several institutions are seeking a way to protect the country's natural and cultural heritage. The areas selected by the National Environmental Study (OPP / OAS / IDB, 1991) are not necessarily the only areas to be considered, but are based on the state of knowledge at the time the report was prepared and the
interest expressed by concerned institutions. Additional areas with conservation value may be identified and considered in the future, as new information and interests arise.

Note: The above article was reviewed by Ing. Ana Cazzadori, National Coordinator of the National Environmental Study, during the General Assembly of IUCN, held in Buenos Aires in January 1994, and still found to reflect Uruguay’s current situation. Verónica Sarli and Silvia Umpiérrez, Uruguayan biologists, sent in additional comments in March 1994:

Editorial update: Humedales del Este (the Eastern Wetlands) Biosphere Reserve and Ramsar Site (350,000 ha in the department of Rocha) is the largest and most important protected area in Uruguay. The Program for Biodiversity Conservation and Sustainable Development (PROBIDES) is operating there with funding from the United Nations and in cooperation with the Rocha Government, the Universidad de la República, and the Ministry of Housing, Land Use Planning, and the Environment (MVOTMA). The goal of PROBIDES is to work with the local community in establishing conservation measures that are compatible with the economic development of the community. There is no intention of eradicating the local people’s farming, grazing, or other land uses, but rather to promote a balance between development and conservation. The establishment of protected areas is done via agreements with the landowners, who participate in the preparation of management plans for these areas. This is the case for Laguna de Rocha, and in the near future, Laguna Negra.

PROBIDES also works with NGOs throughout the country, especially in the organization of workshops on conservation and development, selection criteria for protected areas, and ecotourism. One of the principle problems that impede efficient functioning of nature conservation programs in Uruguay is the lack of legal support. An integral approach is lacking, in both the overall proposed system of protected areas and the objectives of each of these areas. In order to improve on this situation, currently two proposals are being drafted for a Law on Protected Areas. The first is being prepared by the Uruguayan Network for Technical Cooperation in National Parks, other Protected Areas, and Wildlife, and the second is being formulated by the Franciscan Center for Ecological Investigation and Promotion (Centro de Investigación y Promoción Franciscano y Ecológico, CIPFE).

Uruguay is moving toward solving its conservation problems, which are relatively manageable. Many of the necessary tools are available, but there needs to be better coordination among the interested organizations. In addition, environmental consciousness must be raised through effective education directed at the entire population. It is essential that the citizenry appreciate the value of the country’s natural resources, recognize their usefulness, and understand how they are benefited by the conservation and rational use of these resources.
References


Uruguay. Photo 64: The capital of Montevideo is situated on the estuary of the La Plata River. The percentage of population classified as urban in Uruguay (almost 90%) is the highest in all of Latin America. Photo 65: In the Department of Rocha, on the far eastern coast, historical forts combine with the natural beauty of the "bañados" wetlands and are included in an extensive biosphere reserve. Photo 66: Within sight of Uruguay's second largest town, Punta del Este, there is a huge sea-lion colony (Arctocephalus australis) on the island of Isla de Lobos, declared a Government Reserve. These marine mammals were severely persecuted in the past for their valuable hides.
Uruguay. Photos 67/68: The picturesque wooded hills around the small town of Minas, 120 km north of Montevideo, supply granite and marble. Near the falls of "Cascada de Agua del Penitente", wild rheas (Rhea americana) may still be seen. The remaining population of this huge running bird (180 cm), once common in Uruguay's savannas, steps, and open woodlands, is now strictly protected.


Venezuela

Inhabitants in national parks: policies and management
Mario Gabaldón

Occupation in national parks: alternatives for the future
Ricardo Pérez Hernández

Guatopo National Park:
relocation of settlers in the interest of a public utility
Edgard Yerena
Luis Escalona

Sierra Nevada National Park:
cooperation with traditional inhabitants
Silvino Reyes
Ibrahim López
Abstract: Venezuela has 39 national parks, covering more than 16% of its territory. In 1940, three years after the creation of its first park, Venezuela signed the Washington Convention. In keeping with the spirit of this international treaty, from 1958 on, an attempt has been made to eliminate all use of natural resources within national parks. In the course of time, however, the National Institute of Parks (INPARQUES), which was responsible for the execution of this strict policy, became aware of the close connection and interdependence that existed between the conservation of natural and cultural resources. This understanding led to a presidential decree in 1989 that permits "traditional populations" that have been established for over 50 years on what are now national park lands to remain there under certain conditions.

The first national park to be established in Venezuela was the "Rancho Grande" National Park, declared on February 13, 1937 and known today as Henri Pittier Park in honor of its promoter. The country's wide variety of natural landscapes gave rise to the desire to preserve at least one representative sample of each in the form of a national park. Thus Venezuela today has 39 national parks covering approximately 12,948,562 ha and representing 16.4% of the territory. The policy that has been followed to date has focused on the conservation of a set of areas that represent samples of the country's most valuable natural heritage, so as to preserve them permanently for the purposes of scientific research, environmental education, outdoor recreation, and tourism.

The administration of these areas, along with that of natural monuments, was the responsibility of the Renewable Natural Resources Bureau (Dirección de Recursos Naturales Renovables) of the Ministry of Agriculture and Livestock (Ministerio de Agricultura y Cria) until 1977 when, with the creation of the Ministry of the Environment and Renewable Natural Resources (Ministerio del Ambiente y de los Recursos Naturales Renovables, MARNR), it was transferred to the National Institute of Parks (Instituto Nacional de Parques, INPARQUES). This institute is a legally recognized entity, which is attached to MARNR. Within INPARQUES, the Office of National Parks (Dirección General Sectorial de Parques Nacionales) has three departments: Planning (park evaluation and monitoring), Management (protection and maintenance), and Public Outreach (interpretation of Nature and training courses).
## Table 1

Venezuela: National Parks

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>National Parks</th>
<th>Location (State)</th>
<th>Area in ha</th>
<th>Year created</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Henri Pittier</td>
<td>Aragua, Carabobo</td>
<td>107,800</td>
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<tr>
<td>2</td>
<td>Sierra Nevada</td>
<td>Mérida, Barinas</td>
<td>276,446</td>
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<td>3</td>
<td>El Avila</td>
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<td>81,800</td>
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<td>Guatopo</td>
<td>Miranda, Guarico</td>
<td>122,464</td>
<td>1958</td>
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<tr>
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<td>Yaruní</td>
<td>Yaracuy</td>
<td>22,670</td>
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<td>Archipiélago Los Roques</td>
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<td>221,120</td>
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<td>Macucn</td>
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<td>1973</td>
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<td>Mochima</td>
<td>Sucre, Dep. Federales</td>
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<td>Tapo-Caparo</td>
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Legal Guidelines

The first legal instrument governing Venezuelan national parks was the 1940 Washington Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere, passed as a Law of the Republic by the Venezuelan Congress in October 1941. Article III of this document is worthy of note as a guideline for the management of national parks:

"The Contracting Governments agree that the boundaries of national parks shall not be altered, or any portion thereof be capable of alienation, except by the competent legislative authority. The resources of these reserves shall not be subject to exploitation for commercial profit. The Contracting Governments agree to prohibit hunting, killing, and capturing of members of the fauna and destruction or collection of representatives of the flora in national parks..."

The above provisions were reaffirmed, with similar wording, in Articles 11 and 12 of the 1965 Forestry Law on Soils and Waters (Ley Forestal de Suelos y de Aguas), in the section on national parks. Articles 15 and 16 of this Law establish the policy for the legal protection of the areas through expropriation for public utility reasons:

"Article 15. The National Executive shall determine, for each national park, the private property zones that shall become subject to expropriation for public utility reasons. Additional clause: The limitations that the creation of national parks on privately owned lands impose on the latter's rights shall originate no indemnity, unless agricultural or livestock activities are being carried out on these lands, in which case expropriation shall be performed. Article 16. The Ministry may authorize or establish conditions for temporary continuation of agricultural or livestock activities being carried out in an area declared a National Park, provided these activities do not interfere with the park's particular objectives."

In regard to the temporary continuation of agricultural or livestock activities that had been carried out prior to a park's declaration, the Regulation of the Forestry Law on Soils and Waters (Reglamento de la Ley Forestal de Suelos y de Aguas, 1969) permits these activities provided they are not in conflict with the Park's objectives. These activities are also subject to the condition that "no new areas shall be opened up for farming, the number of livestock shall not be increased, and no works shall be executed that increase the overall value of the property."

In cases where these uses are incompatible with the park's objectives, Article 69 of the Agrarian Reform Law (Ley de Reforma Agraria) states: "The existence of any natural resources conservation problem on lands that have been declared protective or reserve areas shall make the removal of the inhabitants of these regions a compulsory and urgent matter. In these cases, it is the National Agrarian Institute's (Instituto Agrario Nacional) obligation to relocate the population to suitable places, preferably in the same region, settling them in an agrarian center with the appropriate compensations."
Table 2

Venezuela: Natural Monuments

<table>
<thead>
<tr>
<th>No. on Map</th>
<th>Natural Monuments</th>
<th>Location (State)</th>
<th>Area in ha</th>
<th>Year created</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Alejandro de Humboldt</td>
<td>Monagas</td>
<td>181</td>
<td>1949</td>
</tr>
<tr>
<td>41</td>
<td>Aristides Rojas</td>
<td>Guárico</td>
<td>1,630</td>
<td>1949</td>
</tr>
<tr>
<td>42</td>
<td>Maria Lionza</td>
<td>Yaracuy</td>
<td>11,712</td>
<td>1960</td>
</tr>
<tr>
<td>43</td>
<td>Cerro Santa Ana</td>
<td>Falcón</td>
<td>1,900</td>
<td>1972</td>
</tr>
<tr>
<td>44</td>
<td>Laguna de Las Marites</td>
<td>Nueva Esparta</td>
<td>3,674</td>
<td>1974</td>
</tr>
<tr>
<td>45</td>
<td>Las Tetas de María Guevara</td>
<td>Nueva Esparta</td>
<td>1,670</td>
<td>1974</td>
</tr>
<tr>
<td>46</td>
<td>Cerros Matasse y Guayamuri</td>
<td>Nueva Esparta</td>
<td>1,672</td>
<td>1974</td>
</tr>
<tr>
<td>47</td>
<td>Piedra del Cocuy</td>
<td>Amazonas</td>
<td>115</td>
<td>1978</td>
</tr>
<tr>
<td>48</td>
<td>Cerro Autana</td>
<td>Amazonas</td>
<td>480</td>
<td>1978</td>
</tr>
<tr>
<td>49</td>
<td>Morros de Macairá</td>
<td>Guárico</td>
<td>99</td>
<td>1978</td>
</tr>
<tr>
<td>50</td>
<td>Cueva Alfredo Jahn</td>
<td>Miranda</td>
<td>58</td>
<td>1978</td>
</tr>
<tr>
<td>51</td>
<td>Laguna de Urao</td>
<td>Mérida</td>
<td>29</td>
<td>1979</td>
</tr>
<tr>
<td>52</td>
<td>La Chorrera de Las González</td>
<td>Mérida</td>
<td>126</td>
<td>1988</td>
</tr>
<tr>
<td>53</td>
<td>Cerro Platillón</td>
<td>Guárico</td>
<td>8,000</td>
<td>1989</td>
</tr>
<tr>
<td>54</td>
<td>Loma de León</td>
<td>Lara</td>
<td>7,257</td>
<td>1990</td>
</tr>
<tr>
<td>55</td>
<td>Pico Codazzi</td>
<td>Distrito Federal</td>
<td>11,850</td>
<td>1991</td>
</tr>
<tr>
<td>56</td>
<td>Formaciones de Tepuyes</td>
<td>Bolívar, Amazonas</td>
<td>1,750,000</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Abra de Río Frio</td>
<td>Tachira</td>
<td>963</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Piedra La Tortuga</td>
<td>Amazonas</td>
<td>525</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Piedra Pintada</td>
<td>Amazonas</td>
<td>1,425</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Meseta La Galera</td>
<td>Mérida</td>
<td>95</td>
<td>1992</td>
</tr>
</tbody>
</table>

Action and experience

As of 1958, when an administrative structure for national park conservation and administration was set up as a branch of the Renewable Natural Resources Bureau of the Ministry of Agriculture and Livestock, the process began for regulation of human uses within the parks, so as to eliminate the impacts of these activities on the natural processes of these areas.

The designation of parts of the country as national parks had a direct effect on a series of economic activities, thus causing problems that had to be dealt with urgently. This led to a process of evaluations of land tenure in each park, followed by censuses and appraisals of infrastructures and plantations, and ending with payment agreements and the relocation of occupants in sectors suitable for agriculture and livestock-grazing in areas near the parks so as not to separate these inhabitants from their home region.

This process has been taking place in the national parks system since 1958, through special funds contributed by the national government. Public credit laws have made it possible to relocate outside the parks a large percentage of the
conflictive agriculture and grazing, thus achieving the basic objective of national parks.

Parallel to this regulatory action in the parks, it has traditionally been considered that the preservation of natural heritage and the conservation of cultural heritage were two totally different problems. However, since Venezuela's heterogeneous system of national parks contain a rich and varied cultural heritage comprising all the features created throughout history by the skill and ingenuity of successive generations of inhabitants, it has been decided to integrate these features and thus preserve them in space and time in their own natural environment.

Since the cultural heritage to be found in our national parks provides a vital alternative for preserving the country's historic and cultural continuity in a wide and varied natural setting, it is our obligation to preserve, restore, and maintain this heritage, in order to allow future generations to discover and understand our past. It is therefore necessary to guarantee appropriate and rational use of resources (supported by systems of information and interpretation of values and environments), since only in this way may these uses be compatible with the national park concept.

We consider that the ideal formula to preserve cultural heritage values in national parks is closely related to the paradoxical equation: preservation + use = conservation. To preserve while using is synonymous with conservation. Conceptually speaking, to preserve is to safeguard in advance in order to protect from any damage. Use means: exercise, exploitation, or continuous and habitual employment of a person or thing.

Based on these two apparently opposing definitions, we consider that here we have the key to the rational use and restoration of the cultural heritage in order to develop appropriate uses that guarantee conservation of resources. Conservation may therefore be defined as the act of maintaining something in a certain condition, or ensuring that it remains in good condition.

The experience acquired during the long period of national park administration led to the issuance in 1989, through Presidential Decree No. 276, of a partial set of rules for the application of the Land Regulation Law on Administration and Management of National Parks (Reglamento Parcial de la Ley Orgánica para la Ordenación del Territorio sobre Administración y Manejo de Parques Nacionales). These rules established the conditions for the temporary continuation of agriculture and livestock activities, and defined the inhabitants who may remain in national parks.

The regulations for the temporary continuation of agricultural and livestock activities provide that: "The owners of cultivated lands compatible with the park's objectives and established prior to the park's creation may remain thereon, provided they comply with the conditions established in each particular case to ensure their integration with the park's objectives. (...) Persons occupying land in national parks who are authorized to continue temporarily agricultural and livestock activities
Incompatible with the objectives of these parks shall comply with the restrictions established in this Regulation, and in no case shall they open up new areas for cultivation or build new fences, irrigation or drainage works, wells, watering holes, or other works that imply greater intervention or increase the overall value of their property.

INPARQUES must take a census, with appraisal of properties, type of activity carried out, location and size of the area occupied, proof of ownership rights to the land, technology and methods used, and the environmental effects or risks of the activity performed by each occupant established in the national park or natural monument in question. The requirements that these people must fulfill in order to remain in the protected areas will also have to be defined.

These rules ratify that it is the National Agrarian Institute's obligation to take the necessary action for relocation of persons subject to agrarian reform, as provided in Article 69 of the Agrarian Reform Law, referred to above.

Lastly, these rules establish that when the declaration of a national park will necessarily include occupied areas, the management plan in question shall determine precisely the time the occupants have been there (regardless of land title), and establish limitations on their temporary continuation of agricultural activities. This plan shall also indicate the period fixed for the expropriation of private properties when their uses degrade the nature of ownership rights. The procedure in these cases shall be in accordance with the Land Regulation Law (Ley Orgánica para la Ordenación del Territorio), Article 63, which states:

"The uses regulated and permitted in the management plans are considered legal limitations on property and therefore do not, in themselves, create rights to compensation. Indemnity may only be claimed by the owners in cases of limitations that void the powers conferred by ownership rights, provided there is definite, actual, individualized, and financially calculable damage. In these cases, the criteria established in the Law on Expropriation for Reasons of Public or Social Utility (Ley de Expropiación por Causa de Utilidad Pública o Social) shall be followed."

In regard to what we consider the most important point for ensuring the conservation of communities that preserve significant cultural samples, Chapter IX of the Rules establishes that: "When an area declared a national park contains settlements over 50 years old whose social, economic, and cultural way of life alone constitutes a factor for improvement of the natural environment, this area shall be demarcated (including an area to allow for natural growth) and zoned for "use by the traditional population" (zona de uso poblacional autóctono o poblado turístico)."

In no case shall the establishment of families from other regions be permitted in traditional settlements, or any modification of the existing way of life. Control of the zone will be assigned to one of the inhabitants, selected from the most representative members of the community, who shall be an employee of INPARQUES with the following responsibilities:
- organize the community, with guidance from INPARQUES;
- comply and ensure compliance with the park regulations, in particular those referring to the community;
- represent the community in the preparation and review of the park regulations;
- report to the park superintendent any entrance of squatters, as well as any attempt to transfer property to persons who do not belong to the community.

Park zones designated traditional settlements may only be sold, with the prior approval of the competent authority, to persons who are members of the settlement community. Sale to other persons is prohibited, and in any case, the State shall be obligated to acquire the property, as provided in the Law on Expropriation for Public or Social Utility Reasons. Expansion of the settlement shall take place in accordance with the rules established by the respective park regulations, in consultation with the community.

**Editorial update:** Since 1992, four national parks and four natural monuments have been declared (see Tables 1 and 2). The policies concerning inhabitants of protected areas are, and will continue to be, the same, as long as Decree 276 remains in force. The establishment of "traditional population zones" has continued, in accordance with this decree, and there are no plans to change this situation. On the contrary, a National Parks and Natural Monuments Law is being prepared, with the support of the Congress and INPARQUES. Its goal is to provide greater legal and institutional stability to a series of policies that have shown to be appropriate in recent years, especially those that promote the stable status and recognition of indigenous and traditional farming communities that were established prior to the declaration of protected areas. The experience of improving the situation of parks and monuments, through formulation of management plans and use regulations, has been very positive in recent years. Between 1989 and 1993, 28 of these plans and regulations have been prepared, all of which via a process of public consultation with the local communities. Thirteen of these documents have been legally approved, and the other 15 have been held up for bureaucratic reasons related to the change of government. The process of public consultation has shown itself to be very successful, given that: (a) the communities are generally satisfied with the proposals arrived at, (b) it has been recognized that national park status does not threaten the stability of traditional communities, and (c) cooperative agreements have been achieved, along with a friendly atmosphere and less opposition to the national park. Unfortunately, the current government (President R. Caldera, 1994-1999) has not shown an intention to continue this policy of public consultation and preparation of management plans and use regulations (pers. com. E. Yerena, February 1995).
Abstract: Instead of providing a legal analysis of current Venezuelan legislation, the author reviews the political concepts behind present standards and questions the current philosophy regarding human occupancy in national parks. Although over 50 years have elapsed since the creation of the first national park in Venezuela, there has never been real regulation of land tenure and occupancy in the national parks. One wonders whether this is due to State negligence in dealing with the problem or whether it is an error to apply the terms of the 1940 Washington Convention directly to the Venezuelan national park system. Consequently, an invitation is issued to other South American countries facing the same difficult situation as Venezuela, to cooperate in reforming the system established by the Convention, which is the basis of all current legislation on protected natural areas. Such a reform may allow Man and Nature to coexist on the best possible terms, leaving each country free to draw up its own legal system in accordance with its specific socio-economic realities.

Occupation of Venezuelan national parks is an issue that acquires special importance when we consider that a large part of Venezuelan territory is protected within national parks. If we also take into account the fact that a considerable part of the lands subject to the park system are privately owned, and that a great number of people live within the parks, it is easy to understand why this issue is of particular significance to our country.

The following pages, rather than being a legal analysis of the legislation in force in Venezuela, contain notes on the political concepts underlying the current norms, along with some considerations on the subject. For our analysis, it is essential to understand the concept that prevails in law with respect to national parks. We believe it is more important to analyze the basic idea behind current legislation than to make a detailed analysis of its specific aspects. This approach is used, as we will see later, because we consider that the current philosophy regarding national park occupancy is questionable.

The first Venezuelan national park was declared in 1937, that being Henri Pittier National Park. At that time, there was no legislation regulating such areas in a special and coherent manner. It was only after the Convention for the Conservation of the Flora, Fauna, and Scenic Beauties of the Americas (held in Washington in 1940) and its subsequent enactment as a Law of the Venezuelan Republic on November 13, 1941 (Official Gazette No. 20,643), that our country can be said to
possess true national park legislation, particularly if we take into account that by participating in this international accord, our country also became part of a system that is now worldwide.

We emphasize the international nature of the regulation so that the reader will understand that any proposed modification of the legal system governing national parks in any signatory country, and specifically in our own, must be made within the framework of the current international system, so as to maintain compatibility with the worldwide national parks system. Since the first national park was created in the United States of America, it is not surprising that the regulation of such areas, throughout the world, is oriented by that country’s concept. The United States conceived of national parks as large areas free from permanent human occupation, which is possible in countries with enormous economic potential and vast territories. While we fully understand and share this concept, it should nevertheless be pointed out that for national parks to be free from human occupation, the following actions are necessary:

- relocation of any communities living in the park to outside of the area;
- expropriations of private properties, so that the lands on which national parks are established become State property and may fulfill assigned public use objectives.

This manner of conceiving of national parks prevailed at the international level, and is the basis for the Washington Convention, as can be seen from its wording. As provided in Article 1 of the Convention, national parks have a “public use” objective, and if this objective is to be accomplished, the land on which a park is established cannot be private property; otherwise, basic ownership rights would be denied. Article 3 states: “The Contracting Governments agree that the boundaries of national parks shall not be altered, or any portion thereof be capable of alienation, except by the competent legislative authority.” This rule again presumes that national park lands are public property, since prohibiting their alienation is contrary to private ownership rights.

Upon signing the Convention, our country adopted the above concept, and since that time, legislation has shown a marked tendency to consider occupancy in national parks (and the existence of private property therein) as clearly contrary to the parks’ objectives. Only on an exceptional and temporary basis is it permitted to continue agricultural and livestock activities when they involve occupation of Venezuelan national parks. Indeed, Articles 15 and 16 of the Forestry Law on Soils and Waters (Ley Forestal de Suelos y Aguas) state:

“Article 15: The National Executive shall determine, for each national park, the private property zones that shall become subject to expropriation for public utility reasons. Additional clause: The limitations that the creation of national parks on privately owned lands impose on the latter’s rights shall originate no indemnity, unless agricultural or livestock activities are being carried out on these lands, in which case expropriation shall be performed.
“Article 16: The Ministry of Agriculture and Livestock (Ministerio de Agricultura y Cría; since 1977 responsible: the Ministry of the Environment and Renewable Natural Resources, Ministerio del Ambiente y de los Recursos Naturales Renovables) may authorize or establish conditions for temporary continuation of agricultural or livestock activities being carried out in an area declared a National Park, provided these activities do not interfere with the park’s particular objectives.”

It can be inferred from the above that all occupancy is considered contrary to the park’s objectives and that the continuation of agricultural and livestock activities may only be authorized on an exceptional and temporary basis. In this way, our country adopts the concept expressed in the Washington Convention. As we have seen above, however, private properties can and do exist in Venezuelan national parks, and are subject to the limitations on land ownership expressed in the park’s declaration. In our opinion, this is confirmed by the Land Regulation Law (Ley Orgánica para la Ordenación del Territorio) in Articles 63 and 64, as follows:

“Article 63: The uses regulated and permitted in the land regulation plans are considered legal limitations on property and therefore do not in themselves give rise to indemnity rights. Compensation may only be claimed by the owners in cases of limitations that void the powers conferred by ownership rights, provided there is definite, actual, individualized and financially calculable damage.

“Article 64: When the execution of the land regulation plans imply the annulment of ownership rights, the respective competent authorities shall proceed with expropriation. ... Additional Clause: If at the expiry of the period fixed for the execution of the expropriation provided in the respective Decree ... no action has been taken ... the owner shall be compensated for the limitations on the use of his property and its use shall be regulated in accordance with the objectives established in the respective Plan.”

If the Washington Convention criterion is that such areas are intended for non-commercial public use and conservation aimed at maintaining them in their most primitive state, we must conclude that our country should proceed with expropriation. While it is true that the Land Regulation Law states that limitations on ownership do not necessarily lead to expropriation, except in cases where they void ownership rights, it is also true that under the Forestry Law on Soils and Waters occupation may only be permitted on an exceptional and temporary basis. From this, it must necessarily be inferred that owners must be expropriated, since, if an owner cannot occupy his own land, his ownership rights have obviously been voided.

Although over 50 years have elapsed since the creation of the first national park in Venezuela and overall expropriation has been carried out in only one park (Guatopo), there has never been any effective regulation of land and occupancy in the rest of these areas. One wonders whether this is due merely to State negligence in dealing with this issue or whether the real problem lies in the fact that the terms
of the Convention are not applicable to the Venezuelan national park system. While it cannot be denied that the State may well have acted negligently in the protection and administration of national parks, we believe that the basic problem goes deeper than this and compels us to define the reasons why the national park system has not been effective, as it is legally conceived. The social and economic realities of our country prevent this concept from being successful. This is shown by the fact that although current laws prohibit it, occupation still continues, and the State has been either unable or unwilling to remove the inhabitants from national parks, and has not executed the expropriations that would be required to comply with the terms of the Convention on which our legal provisions are based.

The national park system in the United States of America, and hence the system established in the Washington Convention, presumes that the lands on which such areas are established are public property. In our case, application of this concept would mean expropriating private properties existing in the areas reserved for this system. It could be argued that expropriation is not necessary, as has been maintained repeatedly by INPARQUES, with the opinion that national park declaration can be interpreted as a limitation on ownership that does not necessarily require expropriation and its high cost. The supporters of this theory forget that such limitation cannot be understood as a negation of ownership rights. The scope of this chapter does not include a legal analysis of limitations on ownership, but in any case, we believe it is obvious that private owners should not be required to maintain, with their own property, something that is of common benefit for all.

Aside from legal considerations and in connection with the possibility of expropriating areas declared national parks, it must be considered whether our country is in a position to carry out such expropriations. In our opinion, the answer is no. If our country was unable to expropriate these areas when financial resources were plentiful, it can hardly be expected to do so in the midst of a serious economic crisis. The cost of such solutions and the complexity of their implementation lead us to discard the idea of expropriation, least of all the areas that make up the country’s national parks system. Neither is it feasible to relocate the people settled in national parks, although there are rules to this effect. In practice, no action has been taken to enforce such rules (except in Guatopo), and there should be a review of the legal provisions governing this matter. Article 69 of the of the Agrarian Reform Law (Ley de Reforma Agraria) states, in this connection: “The existence of any problem of conservation of renewable natural resources in areas that have been or are declared protective or reserve zones ... shall make it compulsory and urgent to remove the inhabitants of such areas”.

In addition to the economic problem referred to above, application of the traditional national park concept in Venezuela has had some negative consequences. The fact that national park inhabitants have not been relocated under favorable conditions has made them the severest critics of the national parks system, which they regard as a limitation on their development. Basically, this is a case of solving the
dialectic dichotomy between Nature and society, between Man and his environment, these terms being considered not as contradictory, but rather those of an evolving entity. The inhabitants of the communities established within Venezuela’s national parks must be respected in the search to find a balance between their interests and the protection of Nature.

The declaration of a national park in Venezuela, as in any other country, causes a direct impact on the people who live in the park and its area of influence, and this impact becomes almost exponential for the country. As a result, we are faced with the need to reform the national park legislation; to maintain the system in force; and, in that case, proceed with the expropriation of land (and occupancies) within national parks. If this cannot be done, a large portion of these areas will have to be released from their protected status, as a last resort. This, in our opinion, defines the problem to be addressed.

The economic circumstances referred to above, along with our country’s particular social and cultural realities, make it quite impossible to remove all national park occupants, relocate them, expropriate the reserved areas, and pay the great legal expenses involved. By the same token, it is not advisable to release areas from national park status because of the impossibility of expropriations, in order to adapt them to the current legal system. However, we are not opposed to total or partial release for other reasons. Release of national park lands would seriously affect the conservation of natural resources, to the detriment of all Venezuelan citizens.

Having discarded the options of total expropriation and vacating of national park areas, as well as the idea of mass releases from protected status, we propose that national parks be regulated in such a way as to permit controlled human occupancy: owners should be offered profitable economic alternatives; human activity in the parks should be regulated; conservation objectives should be made compatible with the undeniable need to permit profitable use by occupants and owners. In addition, we believe that such a course of action would lead to better conservation of the parks, since it would eliminate (or at least reduce) the inhabitants’ rejection of park management, and they might even become supporters of the parks. In accomplishing this, the type of occupants and the permitted uses must be clearly identified. To date, the Law makes no distinction between the types of occupants found in these areas, apart from an elementary consideration of farmers who, as we have already seen, are entitled to continue their former activities, albeit in a temporary manner. We believe that permanent uses of various types should be permitted, according to the specific characteristics of different zones within each park. With the merger of such interests, national parks acquire true meaning and may be more easily managed, without major conflicts and with the highest percentage of success in their preservation and administration, for the benefit of all concerned.

As we indicated at the beginning of this paper, in order to change the current system, without withdrawing from our international commitments, our country should join forces with other South American countries (in similar or even worse
situations), in reforming the Washington Convention system. In this way, Man and Nature may be allowed to coexist on the best possible terms, allowing each country to adapt its specific legislation to its own socio-economic realities. For these reasons, we are convinced that the most appropriate course of action for Venezuela is not to withdraw its parks from the worldwide system, but, instead, to act in the way described. We trust these brief notes will contribute to creating an atmosphere of discussion on the issue of occupancy in national parks and that this discussion will produce prompt solutions.

*Editorial update:* The legal dilemma of Venezuelan national parks in relation to their inhabitants has somewhat decreased if one considers the new definitions of protected areas established by the General Assembly of IUCN in 1994. According to the revised national parks definition, certain controlled use of natural resources may be permitted for traditional, and especially indigenous, populations. The Venezuelan Decree 276, which allows traditional, environmentally well-adapted groups to remain within the national parks, could by this become internationally acceptable. Nevertheless, the obligation to follow the norms established by the Washington Convention (as an international agreement that has been signed by Venezuela) continues to pose legal problems, which merit further consideration.
Guatopo National Park:  
relocation of settlers in the interest of a public utility

Edgard Yerena  
Luis Escalona

Abstract: Guatopo National Park was declared in 1958 with an initial area of 100,000 ha. Since its extension in 1985 it covers 122,464 ha. Its mountainous region with exuberant forests is of great strategic value due to its watersheds which supply water for Caracas, the country’s capital. At the time of declaration, the Park had a population of over 4,200 farming families (approximately 30,000 people). The national government decided to relocate them in order to protect these important watersheds, and the process of relocation was mostly completed by 1971, after an intense process of political negotiation characterized by firm action on the ground with full legal and governmental support. This chapter provides a summary of the processes used. The solution adopted avoided the complications of a possible management of the Park as a multiple-use area. It was also an achievement from an ecological, economic, and political point of view, since it permitted the recovery of important ecosystems that were in process of degradation, at low cost and with a significant strengthening of legal respect for national parks.

Guatopo National Park was established by government decree No. 122 dated March 28, 1958. It was originally designed to include the entire watersheds of the Lagartijo, Taguacita and Taguaza Rivers, and parts of those of the Orinoco and Cuira Rivers, all of which (except the Orinoco River) belong to the Tuy River Basin. The Park’s boundaries were defined mainly by the limits of these watersheds, and it had an estimated total area of 100,000 ha. It is only two hours from Caracas by paved road, in the area of the towns of Santa Lucia and Ocumare del Tuy.

Studies and negotiations for the declaration of this Park commenced some years prior to 1958, during the government of General Marcos Pérez Jiménez, but the actual designation was one of the first decisions made by the Government “Junta” that deposed him in January 1958 and subsequently established democracy in Venezuela. Guatopo National Park and the Avila mountain range (also declared a national park in 1958) were, and still are, the only two outstanding natural areas with relatively undisturbed ecosystems that remain near Caracas.

By 1958, the planners and technicians of Caracas’ public water works already envisioned Guatopo’s importance for the city’s water supply. The capital city’s traditional water sources (streams to the west of the city) were insufficient to meet its growing needs, and other potential sources were rapidly being deteriorated due to urban pollution. The alternatives, in the short term, were to bring water from the
Guárico River Basin in the country's central plains, or to take advantage of the potential of Guatopo in the Tuy River Basin. The rivers that have their source in the present-day Guatopo National Park are the largest and least polluted in the area surrounding Caracas, with an approximate flow of 30 m$^3$ per second. During the 1950s, plans were made and funding obtained to dam the Lagartijo, Taguacita, Taguaza, and Orituco Rivers. Construction of a dam on the Lagartijo River began in the mid-fifties, along with the installation of a pipeline to carry its waters to Caracas, overcoming a difference in altitude of over 700 meters.

**Physical, biological, and social features of the Park**

The entire Park is basically mountainous, with steep slopes. Rainfall decreases from east to west, ranging from 2,700 mm/year and 800 mm/year, and this strongly affects the ecosystems of the area. Altitude ranges from 200 to 1,500 m above sea level, with most of the area being between 200 and 600 m. It can therefore be considered a region of humid tropical climate with a mean annual temperature of 22-25°C over most of its area. All this generates humid tropical vegetation (rain and cloud forests) on the east, north, and center, and seasonal vegetation (semi-deciduous forest) on the west and south (Yerena, 1985). Biogeographical and paleobiological evidence suggests that the area had a rainy climate in the past, and it is therefore considered a “Pleistocene Refuge”.

Guatopo’s flora and fauna have some Amazonian influences and there are at least 10 local endemic species. Nothing is known of any local extinctions in the past, but nevertheless many key species of the ecosystem, or of particular interest to conservation, are still present in the area, such as the jaguar (*Felis onca*), the Brazilian tapir (*Tapirus terrestris*), the harpy eagle (*Harpia harpyja*), and the white-bellied spider monkey (*Ateles belzebuth*).

**Social characteristics**

The process and characteristics of human occupation of this area were determined mainly by the agro-ecological conditions and accessibility of each sector. The eastern rainforest sector was colonized in a dispersed manner, principally on relatively flat land with alluvial soils, for subsistence and semi-commercial agriculture, basically cacao, bananas, plantains, root crops of the family Araceae, and other humid climate cultivated species. For the most part, these inhabitants were the descendants of African slaves who had escaped from the vast cacao plantations of the adjacent Barlovento Plains since the seventeenth century, seeking refuge in these densely forested mountains (Guerra, 1984).

The western and southern sectors, with seasonal climates, were suitable for a greater diversity of crops. They were therefore more intensely occupied, particularly from the mid-19th century on, and there has been subsistence, semi-commercial,
and commercial farming, principally producing coffee, fruit trees, and tubers. This was especially the case in the Lagartijo and Orituco watersheds, where extensive livestock-grazing was also introduced, possibly prior to coffee cultivation (early 19th century). Hence the cutting and repeated burning of vegetation to generate pasture lands and savannas became quite common (Yerena, 1985).

Timber and fire-wood extraction was also particularly important in the seasonal forests of the eastern sector, where fine hardwoods of great commercial value were abundant. These activities led to the appearance of agricultural settlements and the establishment of a small supply town called Quiripital, now the largest town in the municipality.

Attempts were made around 1880 to establish agricultural settlements in the Orituco watershed with European immigrants, mainly Italians. Although the settlements failed, these immigrants left descendants who adapted to the local semi-commercial and subsistence production system. There were also two large coffee estates in this area, employing a relatively high number of workers, in almost all cases poor farmers who at the same time engaged in agricultural production for the local food supply. After the oil boom of the forties, however, these estates became unprofitable and were virtually abandoned by the end of the fifties.

In summary, a panorama of Guatopo at the beginning of the 1950s revealed relatively dispersed occupation by poor farmers on the east and slightly more intense occupation on the west and south, mainly under fairly primitive, subsistence, and semi-commercial family production systems, where most of the inhabitants did not own the lands they cultivated.

**Promotion of a national park**

The town of Altagracia de Orituco, in the north of the Plains ("Llanos"), maintained trade links with Caracas and the Tuy valleys by means of mountain roads to the south of Guatopo. In 1953, as part of a policy of providing the country with a good road network, construction commenced on a road to connect this town with the Tuy valleys and Barlovento. This involved the first real penetration into the central and northern portion of the Guatopo rainforests, and the contractors working on the road saw opportunities for extracting these forests' valuable timber resources.

Timber exploitation began immediately, using the road, while it was built, as the axis for penetration tracks from where winches hauled in the logs, in some cases by means of aerial cables, to sites along the new road. The timber interests approached the government to have these forests declared a forest reserve, in order to have a more favorable legal environment for their logging. This caused great concern among the country's few conservationists and among the planners of the Caracas water supply, at a time when the Ministry of Agriculture was developing ambitious programs for the conservation of soils and watersheds.
This process principally involved the Taguacita and Taguaza watersheds. The possibility of significant deforestation, with resulting erosion, loss of water flow regularity, and their effects on the future reservoir projects, were considered serious reasons to initiate efforts to protect the area. At the same time, there was considerable uncontrolled occupation of land along the road, in some cases by farmers from nearby areas, and in others, by investors from Caracas with plans for parceling and developing land for recreational purposes.

In the face of this situation and the growing risk of destruction of the rain forests, not many options were available, at least for the government technicians graduated from the new schools of agronomy and forestry and trained for pragmatic solutions. Another factor was the relaxation of public authority as a result of the recent over-throw of the previous government. The technical and political decision, therefore, was to promote national park designation for all the watersheds reserved for the Caracas water supply, including in particular the Lagartijo River Basin, although it did not form part of the current settlement problem, due to the dam then being constructed. The project also included the remaining forested portions of the Orinoco watershed to the south, in anticipation of the future reservoirs for the Guanapito irrigation system near Altgracia.

**Relocation of inhabitants**

Once the decree creating the Park was issued, the government had the power to eliminate or “freeze” activities in the new national park that were considered damaging to it. Given the Park’s political and strategic importance, it was decided to eradicate or relocate such activities. The forest and water conservation systems, the road, and the water works were considered to be of sufficient public utility to justify expropriation in the public interest. A decree of “expropriation for public or social utility reasons” (expropiación por causa de utilidad pública o social) was issued that covered the entire Park. This sought the complete expropriation and relocation of all existing activities and inhabitants (Decrees No. 257 and 258, dated April 8, 1960). Thus, with only 4 articles of the current Forestry Law on Soils and Waters (Ley Forestal de Suelos y Aguas), which provided a very general definition of the regulations existing in national parks, and with the above three decrees, the long, complex process of expropriation in Guatopo National Park began. Logging was stopped immediately and its infrastructure removed.

**Initial situation and political opposition**

In 1960, there were 4,207 poor farming families living within the Park. Based on an average of 7 persons per family, this would give a total of 29,449 inhabitants. Most of the people located in the middle and lower Lagartijo River watershed
occupied lands granted by the State in the 1930s, and about 10% of them had land titles. There were a few supposed landowners in the rest of the Park, although 85% of these lands were determined to be property of the State. Additionally, some individuals took advantage of the confusion that reigned in the first months after the Parks' creation and invaded the protected area with the idea of claiming rights at a later date and thus obtaining financial gain from indemnity payments.

The relocation measures to be applied were never fully accepted, and in some cases were strongly rejected, by the affected farmers. The agricultural trade unions (e.g., the Farmer Federation, Federación Campesina), mainly those controlled by opposition parties strengthened by the new democracy, united many of the affected farmers and attempted to obtain the repeal of the national park decree or, at least, the expropriation measures. The strategies used ranged from direct negotiations with the highest levels of government to direct threats against park personnel, media campaigns, and disobedience of authorities. Arson became a constant weapon for demonstrating disagreement.

In 1963, the Ministry of Agriculture and Livestock (Ministerio de Agricultura y Cría, MAC), which was in charge of the National Park Service (Servicio de Parques Nacionales), created a commission called the “Guatopo Commando” (Comando Guatopo), integrated by representatives of National Parks, the National Agrarian Institute (Instituto Agrario Nacional, IAN, responsible for land reform and land grants, also a branch of MAC), and the Farmer Federation. This commission’s duty was to reconcile conflicting interests and see that the application of the national park regulations took place as smoothly as possible. This commission met nearly every weekend with the affected farmers. With a view to calming things down, the Guatopo Commando took the following actions:

- a socio-economic census of the affected persons;
- visits to the parcels outside of the Park where the farmers would eventually be relocated;
- program of credit for purchasing homes and agricultural machinery in the new settlements;
- advice on community organization matters;
- service infrastructure in the new settlements;
- donation of seeds to the affected farmers; and
- clearing of paths and tracks.

Another commission that was created was the Guatopo National Park Commission for the Payment of Improvements (Comisión Pagadora de Bienhechurias del Parque Nacional Guatopo), composed of the same institutions as the Guatopo Commando in addition to the Attorney-General (Procuraduría de la Nación), to safeguard State property, the Ministry of Health (Ministerio de Sanidad), for the granting of rural homes, and the Agricultural Bank (Banco Agrícola), which was in charge of credit for the farmers. The Commission’s particular objective was to draw up the process of payment and relocation of the affected families. This process was intensified in
1965. The political opponents endeavored to convince the farmers to oppose relocation and not to accept the land and benefits offered. However, the farmers finally accepted relocation, in most cases, but always subject to the condition that the whole village would be transferred to the same settlement, so as not to break up families or friendships.

At the same time, the other sectors that were adversely affected by the measure, such as former estate-owners, middle-class owners of small and medium-sized lots, urban developers, and timber exploiters, took advantage of the current political and social sensitivity to the farmers’ drama to also exert pressure in high levels of government for annulment of the measure. For example, timber interests sued the government for recognition of, and indemnity for, the potential value of the trees that remained standing and could not be exploited. This attempt met with complete failure when the court ruled that no economic value could be assigned to standing natural forests and that they were not subject to any indemnity whatsoever.

In the face of all these counter currents the Ministry of Agriculture used clever and convincing technical arguments to insist on the need to maintain and restore the original vegetation cover as the only way to guarantee the water supply for Caracas. From the political standpoint, these arguments were well received by judges, directors, ministers, and presidents of the Republic, so that the measure always had support and the process could continue slowly but surely.

Another important factor was the appearance of a guerrilla movement in the early 1960s. Due to the area’s proximity to the capital, the guerrillas established their rural front in the eastern forests of Guatopo, both inside and outside the National Park, using the rural farming sector as a means of development and supply and also as the political objective of their warfare. This situation greatly reduced the possibility of carrying out the census-taking, appraisal and payment process, since the zone became totally militarized and both the park officials and the farmers themselves were subject to uncontrolled guerrilla and military actions. However, there were no indications that the guerrillas made the inhabitants abandon their lands or that they took any action against the National Park as part of their struggle in defense of farmers’ rights, nor that the military exercised any influence to accelerate relocation of the farmers as a strategy to combat the guerrillas. The guerrilla period delayed the relocation process, but without other significant interferences.

In 1968, as a result of political interference, it was decided to set up a Supreme Court Appraisal Commission (Comisión Avaluadora de la Corte Suprema), which hired professionals to make new censuses and appraisals, ignoring those already carried out by park officers. This new commission worked without any coordination with the park administration, and the final report it presented had fundamental defects such as appraisals made outside of the park boundaries or on improvements that had already been paid for. The latter were generally in the names of close relatives of those who had previously received payment. It was also suspected that a percentage was received by political leaders. The great number of irregularities
presented led to a verification of the results of this new report, and many appraisals were declared invalid. Nevertheless, some 300 appraisals were actually paid twice. This experience serves to underscore the need to establish strict control and inspection mechanisms, and that the process should be directed by park officers.

The expropriation process in general could be considered completed by 1971. At that time 3,167 families had been paid, and only a few isolated cases remained to be settled on the Park’s north-central boundaries, in addition to the case of Quiripital, which took longer due to its being the largest town in the municipality. Twenty-five percent of the 220 appraisals made in this town still remain unpaid, and there were some isolated cases of reoccupation of dwellings, as encouraged by political currents. Total payments amounted to US$13 million.

The economic boom of the 1950s had originated a strong current of migration of poor farmers to the big cities, particularly Caracas, since the possibility of obtaining higher incomes in the capital was regarded as a sign of social progress. Thus, some of the people who received payment for their improvements decided to invest their money in settling in the growing marginal districts of Caracas. Others opted for a change of occupation and took up commercial or service activities in small urban centers near the Park. Some of those who emigrated to Caracas were unable to adjust there, and later returned to their rural environment. Most of the farmers continued their agriculture on lands granted by the National Agrarian Institute, or on municipally owned lands, or on lands they purchased themselves. A large proportion of them accepted relocation in new settlements, the majority in sectors near or adjacent to the Park (Barlovento, Santa Lucía-Suapire, and Ocumare-Súcuta) and a minority in the high plains to the south of Altagracia de Orituco (Los Negros settlement), in a very different agro-ecological environment.

**Expropriation procedures**

The following steps indicate the procedures applied in Guatopo National Park, and are the result of a long process of trial and error. Their application is suggested in similar cases where the laws permit them, and they are therefore described below in the present tense:

1. **Preliminary census.** First of all, the approximate location of the affected communities is defined on maps of the area, and a socio-economic census is taken. This census makes a preliminary inventory, without too much detail, of persons, animals, crops, dwellings, and other property. This information is used in planning the subsequent appraisal process and the financial resources required for indemnity payments.

2. **Analysis of results.** The second step is to analyze the census results and divide the areas to be appraised into sectors. Greater priority, for expropriation purposes, is assigned to those who perform itinerant slash-and-burn agriculture ("conucos") and to the areas under "open" cultivation. Areas are defined by blocks or villages, so that the appraisals are carried out in an orderly manner by sectors and stages.
Planning of appraisals. The third step is to plan the procedures to be used. No appraisals are performed until there is complete certainty as to the availability of financial resources for the respective payments, to avoid raising false hopes of immediate payments. It is also necessary to provide for the participation of Farmer Federation representatives in the appraisals so that the people will feel that their rights are being safeguarded. Prior arrangements should also be made with the National Agrarian Institute so that land will be available for the relocation process.

A few days before the appraisals begin, a meeting of the inhabitants is called to explain the procedures to be applied, the itinerary to be followed and the dates the appraisals will take place. This prepares the way for good work by the appraisers and good collaboration by the farmers. The appraisers also set up two work teams, a field group that gathers the on-site information and an office group that tabulates the results and organizes the information.

Making the appraisals. The fourth step is the performance of the appraisals, witnessed by a Farmer Federation representative. The appraisal consists of a detailed inventory of the real estate alleged to be the property of the farmer, generally the head of the family. This information is entered in field notebooks in a previously established order and on specially designed forms. No estimate of the property's value is made at this time. Upon completion, an agreement certificate is signed by the representatives of the organizations involved, the witnesses, and the farmer, indicating his full name and identification, and the exact names of the place, sector, and zone where the appraisal was made. This is to set on record that the appraisal was performed on site and not from an office desk. It is advisable to mark the limits of the premises evaluated in an appropriate manner (e.g., with paint), as well as dwellings, trees, etc., to facilitate review, if necessary.

Processing the appraisals. The fifth step is processing, where the office team checks and puts in order all the data entered in the field notebooks and transfers it to the appraisal forms. The improvements inventoried should be recorded on these forms in the greatest possible detail, and a unit price is assigned to them at rates established by the Supreme Court of Justice (Corte Suprema de Justicia), which should reflect local market prices. All arithmetical operations should be carefully checked and the final result transferred to typewritten forms issued in original and five copies.

Acceptance of the appraisal. The sixth step is to invite the farmer to the park office, where the appraisal results are read to him in the presence of witnesses. If he is in agreement with the amounts fixed, the original and the five copies of the form are duly signed and the farmer retains one copy for himself.

Legal recognition of rights. The next step is of a strictly legal nature and consists in legitimating the applicant's (the farmer's) ownership rights to the improvements appraised. This is done by obtaining a "supplemental title" from the agrarian court. It is suggested that this formality, which tends to be very slow and complicated, be
carried out by the park office on behalf of the farmer, to avoid unnecessary trouble and delay. On completion of this formality, the applicant has only to appear once in the courtroom, with his witnesses, to sign the land title. This process varies significantly when the farmer is the owner of the land he occupies. In this case, he must present his land title, a sketch of the land, and a technical study including the following points: analysis of slopes, water courses and springs, accessibility, and vegetation cover. These details make it possible to estimate the price of the land, according to rates set specifically for the protected area in question by the Supreme Court of Justice.

Payment formalities. The eighth stage of the process consists of gathering together the respective land titles, the appraisal, and the identification of the interested party and witnesses, all duly authenticated by the park office, to be sent to the Ministry. There the controller’s office rechecks the calculations and authorizes the issue of the payment order. Delivery of the payment check is usually made by a legal consultant of the National Park Service. Once payment is made, the central level should notify the park office immediately to make sure that the homesteads are vacated and that the area superintendency takes possession of them in the name of the State. To do this, however, the farmer must have been granted his relocation, otherwise he cannot be compelled to vacate.

Settlement of disagreements. When the inhabitant is not in agreement with the appraisal, the case is submitted to a verifying commission. Discrepancies may arise due to a faulty inventory or disagreements with the rates of payment. In the first case, witnesses are called and a new inventory is taken. In the second case, negotiations can be made with the farmer and an attempt made to compensate the low prices by assigning a larger amount of improvements so as to increase the price. This has been done in many cases where it was considered that the estimated prices were too low, taking into account the social cost to the inhabitant. Since this is a process that takes years to complete, steps were taken to freeze all activities, thus restricting the areas under cultivation to those existing at the time of the Park’s designation and making it impossible to extend such area or make any change in the type of crops which could drastically modify the vegetation cover. Programs were also set up to combat and prevent forest fires and illegal hunting.

Extension of the national park

In 1985, when work began on the construction of the Cuira Dam, the Ministry of the Environment (Ministerio del Ambiente y de los Recursos Naturales Renovables, MARNR, the present administrator of national parks) negotiated the extension of Guatopo National Park so as to include the future reservoir and its adjoining lands, but not the entire watershed. It was also proposed to correct some technical inconsistencies of the northwest boundary. The objective was to vacate the lands that
Guatopo National Park: relocation of settlers in the interest of public utility

would be flooded by the dam and their adjacent areas, thus providing a safety belt around the dam free from agricultural activity.

With this extension, the Park increased in size to 122,464 ha, including 23% of the Cuira River watershed. The new sectors were the home to about 490 families engaged in the semi-commercial cultivation of cacao, fruit, and humid-zone tubers, with socio-economic features similar to those of the inhabitants previously expropriated from the northeast part of the Park. Indeed, some families that had been relocated under the first decree were affected for a second time.

This time, the census and appraisal process was carried out much more rapidly and efficiently. To date, there are 395 appraisals pending payment, and the total amount of the new expropriations is estimated at approximately US$ 1 million. Only 1% of the land is privately owned. This time the families to be relocated have resorted to political appeals in order to obtain better lands for their relocation or better payment for their property. The farmers that have received their indemnity payments have moved mainly to the agrarian reform settlements situated farther to the east of the same mountain range, in fairly similar agro-ecological conditions.

There appears to be a technical inconsistency in the design of this new measure. Expropriation, as needed to protect the watershed, was the technical argument put forward previously, and though it was used again in the case of Cuira, it was decided not to include the entire watershed. The characteristics of this new extension may have been conditioned by the realization, a priori, that relocation of all the farmers in the whole watershed would be a very difficult task, given that there might well be another 600 families in the area that was not included. Apart from the country's new socio-economic reality, the most probable explanation, however, seems to be that the decision was not sufficiently studied at technical levels and that it was limited to generating a kind of "protective zone" around the future dam.

National park management

During its first 20 years of existence, the park administration was engaged in the expropriation process, the installation of a service and personnel infrastructure to limit expansion of human activities, and the prevention of possible invasions or the return of relocated farmers. Ranger stations were set up using farmers' dwellings that were purchased and reconditioned. Workers selected from among the national park inhabitants themselves were hired for maintenance and park ranger duties. Today, there are 18 ranger stations, 7 vehicles, 18 park rangers, 18 workers, 2 forestry technicians, and 1 office clerk. In 1969, however, most of the expropriation process was carried out with 1 forestry technician and 32 other persons including park rangers and workers.

At the same time as the relocation process, but with greater impetus since the 1970s, the less-urgent programs of the Park have also been carried out, including development of recreational areas, signposts, and information centers, mostly along the Park's penetration paths and road. There are currently 10 recreational areas, 3
information centers, 1 self-guided nature trail, several hiking paths, and 2 totally restored historical and cultural sites. The majority of these works have been achieved within the normal budget, without seeking any special funding. The key to this undeniably successful administration lies in the following factors:
- appropriate management of personnel and material resources;
- technical ability and high level of pragmatism in conducting the programs;
- continuity of personnel;
- relative autonomy of the park administration in minor decisions; and
- relatively constant support from the National Park Service’s central office in Caracas.

Current overview

Today, 99% of the national park territory declared in 1958 has been cleared of agricultural and livestock activities. There has been rapid and complete recovery of the rainforests that were subjected to logging or agriculture, from the standpoint of vegetation cover, at least. In the southern and western sectors of the Park (seasonal forests) natural recovery has been much slower due to the forest’s lower regeneration potential and also to the occasional fires that still occur. Nevertheless, qualitative evaluations also indicate effective recovery of the vegetation in these areas.

The region’s watershed potential has been effectively safeguarded or improved, at least from the standpoint of flow regularity and sediment load, and the Taguacita watershed has now been incorporated into the Caracas water supply through the construction of a dam. The Guanapito dam was built in the mid-sixties outside of the Park but taking water from the Orituco River which has its origin inside the Park. Construction of the Taguaza and Cuira dams, inside the Park, is under way and should be completed by the mid-nineties. Loss of habitats due to the flooding of these dams will amount to around 2,200 ha of rainforest, and the ecological consequences of this have not been evaluated. Politically, the conviction prevails that these will be minimal, taking into account the efforts made to save the remaining 122,464 ha of the Park.

Lessons for the future

Was it really a correct and just decision to expropriate and relocate more than 4,000 families in Guatopo? From a purely financial point of view, some of the farmers managed to increase their incomes by moving to the city, and they and their children probably enjoy better living conditions (health, medicine, education). This would have to be judged, however, in the light of a comparative study between the rural dwellers’ present conditions and those of the inhabitants of the poorer urban districts. On the other hand, most of the relocated farmers appear to have at least
maintained the same standard of living. The rule to be followed in these cases is that health conditions, services, climate, etc., at the places selected for relocation should be equal to, or better than, those of the farmers' original sites.

Taking into account the foregoing and the relatively low financial costs of the expropriation, it could be argued that the value of the water consumed by Caracas and its metropolitan area far exceeds the investment made. The total amount spent on expropriation was US$ 14 million, which, over an area of 122,464 ha, gives an estimate of US$ 114.31 per hectare. However, there is a technical variable that should be included in this reasoning: Did the human activities being carried out there really endanger the city's water supply?

In the watersheds with the highest rainfall (Taguacita, Taguaza, and Cuira), the risk of erosion is perhaps more evident and sedimentation of the reservoirs would increase with agricultural activity. However, in Lagartijo and Orituco, where rainfall is lower and where most of the former agricultural sectors were located, flood control, soil conservation, and crop rotation programs could have been set up to lessen risks of erosion. This would obviously have required higher organizational and investment costs, and such projects are more difficult to manage operationally. Possible effects of pollution from sewage and agricultural chemicals could have been reduced through control mechanisms for agricultural practices and more costly water treatment systems. These alternatives would have involved greater investment.

Now that relocation is a fact, the question is, whether the uprooting of numerous poor farming families was justified in order to avoid higher economic costs. We cannot give a precise answer to this question from the sociological angle. From an ecological point of view, a positive balance sheet can be presented, with the recovery, in the Lagartijo watershed, of the only natural area of semi-deciduous forest in the country, not to mention the complete protection of an area of great ecological value. These deciduous and semi-deciduous forests were the first to be highly disturbed or destroyed in the north of Venezuela in historical times, both for the value of their timber and because the climate where they grow offers many advantages for agriculture. Consequently, an analysis would seem to indicate that the decisions made can be justified from a financial standpoint in the first place, and secondly, from an ecological point of view, with particular reference to the relocation of the majority of the families that lived in the Lagartijo watershed.

This analysis, however, cannot escape from the general and strategic significance that Guatopo has had for the Venezuelan conservation movement and for the national park system that protects over 16% of the country's territory. Guatopo has provided experience regarding technical, legal, and political procedures, and has set a legal precedent for the effective defense of a national park. In other words, it has legally strengthened the national parks and institutionally strengthened the government agency in charge of them. The experience of Guatopo has made it possible to undertake more complex expropriation processes, such as those of the marine national parks of Morrocoy (1976) and Mochima (1989). It has also made possible
the rescue and clearance of other similar montane national parks situated in more ecologically (and strategically) critical areas, such as Yurubí, Terepaima and Yacambú. The experience of Guatopo has been instrumental in consolidating the country's respect for national parks, which are often called for in order to solve serious environmental problems. From a South American viewpoint, the strength of this situation in Venezuela is noteworthy compared to the relative weakness that prevails in other countries of the region.

On weighing all these elements in the balance, and considering the unfavorable reception that initiatives to protect wilderness areas seem to meet with in our hemisphere, it can be concluded that the Guatopo experience has been both positive and highly significant.

**Editorial update:** In 1995, the situation of the farming settlements in the extension area of Guatopo National Park appears somewhat changed: their leaders united the communities in resistance against relocation to outside the Park. This, in itself, however, does not present an entirely new situation, since in the past, political and trade union pressures have also been quite strong. What is fundamentally different from former experiences, however, is the lack of political and economic backing in order to accelerate the process of payment and relocation. Currently, Venezuela faces the situation of an economically weak Ministry of Environment, which makes prompt relocation appear highly uncertain. The Park's administration will therefore have to impose strict legal regulations and find adequate administrative mechanisms that, on the one hand, permit the control of agricultural activities and their extensions, but on the other hand, calm down the potential political conflicts by maintaining the dialogue with the farmers and their organizations (pers. com. E. Yerena, February 1995).
Sierra Nevada National Park: cooperation with traditional inhabitants

Silvino Reyes
Ibrahim López

Abstract: Sierra Nevada National Park, created in 1952, includes vast areas of natural vegetation, but also extensive pastures and traditional farming villages. The application of legal provisions on national parks led to a series of conflicts between the inhabitants and the national park authorities, who proceeded to enforce restrictions on land use for better protection of flora, fauna, soils, and waters. A research program of the National Institute of Parks (INPARQUES) and the University of the Andes generated necessary information about the quantity, quality, distribution, and particular problems of the natural and cultural resources in each landscape unit. The results of this study and the agreements reached in discussions with the inhabitants served as a basis for zoning proposals and park management rules intended to make tourism, recreation, and community development compatible with the conservation of natural resources.

Sierra Nevada National Park is located in the central part of the Merida Cordillera in the Venezuelan Andes. It covers 276,446 ha and was designated by the Venezuelan government on May 2, 1952. Altitudes in the Park range from 400 m above sea level in the foothills adjacent to the Apure-Orinoco plains to 5,007 m at Pico Bolivar, the country’s highest mountain. The varying altitudes and marked differences in rainfall produce a series of tropical montane environments, represented in 17 life zones (Holdridge, 1964; Rincón, 1990). These landscapes have developed a highly diverse biota distributed in a variety of forests, thickets, thorn scrubs, páramos (alpine tundra with grasslands and Espeletia spp.), cold deserts, and glaciers with outstanding biodiversity and high endemism.

The relationship between the natural communities of these landscapes and the human societies that have occupied and used the natural resources date from pre-columbian times, and successive historical events have determined the present vegetation cover in vast areas of the Park. The activities with the greatest impact on the montane ecosystems included firewood extraction for cooking and heating (especially at altitudes over 2,000 m), and the use of fire to clear the forest from agricultural plots, to create open areas for hunting and hiking, and to clear and maintain paths. As a result, the post-glacial forest cover (and its associated fauna) were gradually replaced by open plant communities, generally grasslands, thickets, and páramo-vegetation.
With the arrival of the Spaniards came great changes in the type and intensity of land uses on the slopes. The presence of large domestic animals requiring great amounts of forage led to the expansion of savannas and páramos for grazing horses, mules, oxen for plowing, and cattle for meat and milk production. The use of the Venezuelan Andean lands for extensive agriculture and livestock-grazing remained stable until the beginning of the twentieth century, when the economic changes caused by the expanding oil industry drew the population to the cities and industrial areas.

**Park lands and use conflicts**

In addition to the pastures and páramos used for grazing and maintained through annual burning, and agricultural fields near the villages, the area still contained a large amount of undisturbed wilderness, when Sierra Nevada National Park was created in 1952. National park declaration included the legal provisions necessary to protect the area. Nevertheless, a series of conflicts with the area’s traditional inhabitants arose concerning the limitations that were imposed on the use of different zones of the Park.

**Wilderness areas**

Most of the surviving remnants of primary vegetation are lands with steep slopes and difficult access. They occupy about 180,000 ha or 65% of the Park. The main conflict in these areas has been, and continues to be, the extensive grazing of domestic horses and cattle on all kinds of open or low vegetation. The damage caused by this grazing is greatest in the less productive biotic communities where it is particularly cold or dry, or the soils are infertile. Under these conditions, small populations of highly specialized species are extremely fragile and unstable, as in the case of the desert-like vegetation surrounding the Park’s glaciers, which is subjected to unrestricted grazing by hundreds of animals that trample the soil and expose it to erosion. An impact of lesser importance (and occurring on a smaller scale) is caused by the extraction of plants and timber for construction, handicrafts, and medicinal use. The hunting of certain wild animals, such as jaguars (*Felinus onca*), pumas (*Felinus concolor*), tapirs (*Tapirus terrestris*), spectacled bears (*Tremarctus ornatus*), and deer (*Mazama* sp., *Odocoileus* sp.), is mostly restricted by the inaccessibility of the Park’s extensive mountain slopes.

In recent years there have been isolated cases of small-scale deforestation by landless farmers who practice small-scale, shifting agriculture (“conuco”), mainly in the foothills adjoining the plains. This system involves clearing small areas of vegetation that are cultivated for two or three years, and then abandoned to natural plant succession that restores the vegetative cover, although generally with different species than had been there before.
Areas of open or secondary vegetation in the vicinity of villages, cultivated lands and paths, have been grazed extensively since the arrival of the Spaniards. Some of these areas are now converting to thickets and secondary forests, due to emigration of the people from the area. Pastures occupy 85,000 ha, or 30% of the Park. The most significant impact of this type of resource use is the destruction of entire biotic communities when pastures are established, with the subsequent loss of the organic matter and topsoil from the mountain slopes. The type of vegetation is determined by micro-climate, the frequency of burning, and the length of time since the last burning. The objective of repeated burning is to produce a savanna-like landscape. Above 2,200-2,400 m elevation, plants native to the alpine tundra (páramo) begin to form part of these grasslands and fire-adapted thickets, due to the colder temperatures. The replacement of forests by grasslands probably dates from very ancient times, since human groups migrated and settled in the northern South America thousands of years ago. However, the maximum expansion of deforestation occurred later, during the colonial period, with extensive livestock-grazing in the majority of Venezuelan ecosystems.
Agricultural lands

Today, agricultural lands cover about 8,000 ha (3% of the Park) and are mostly worked by poor farmers with traditional technology and small-scale commercial motives (e.g., plows pulled by oxen, shifting cultivation, and little use of agricultural chemicals). On plots of 0.5 ha to 4 ha, potatoes (*Solanum tuberosum*), wheat (*Triticum* spp.), corn (*Zea mays*), manioc (*Manihot* sp.), and bananas (*Musa* spp.) are grown (depending on the altitude) as the principal constituents of the local diet, and always cultivated with other complementary crops. The farmers possess a variety of domestic animals, such as chickens, ducks, goats, sheep, and pigs. All these animals consume farm produce, recycle domestic and agricultural waste, and alter the flora and fauna in the areas immediately adjacent to the farmhouses. There are also other larger animals that require greater quantities of fodder: horses, mules, and cattle. Every family needs these animals, hence the large expanses of pasture lands surrounding agricultural villages.

In recent years, technical innovations in agriculture have reached even the most distant villages. New varieties of high-yield crops and fertilizers have been introduced, but new pests and weeds have also appeared, as well as chemical pesticides to “control” them. One of the main use conflicts that has occurred in the Park’s agricultural lands involves permits for preparing land for cultivation. This conflict derived from misunderstanding by park authorities of the traditional rotation cycle that permits the natural restoration of soil fertility over a certain number of years. The authorities’ prohibition on the clearing and plowing of fallow lands with second-growth vegetation (which they confused with expansion of the agricultural frontier) prompted strong protests that ended in civil disobedience and led to the introduction of sedentary agriculture with the necessary application of fertilizers and pesticides.

Modern mechanized, commercial agriculture, with systematic application of fertilizers, pesticides, irrigation, and drainage, is carried out in park areas with good roads and in areas adjacent to villages. The production units, which cover dozens of hectares, are fully developed areas and their existence inside the Park boundaries would suggest that the designers of Sierra Nevada National Park never imagined the problems involved in applying the legal restrictions on land use imposed by the national park status. The most extreme cases of this are found in El Morro and Los Nevados (villages in the Nuestra Señora River watershed), and in San Rafael de Mucuchies (a small town on the banks of the Chama River), all of which were occupied by people before the arrival of the Spaniards (Febres Cordero, 1960). Towns and villages are difficult to manage and control, and also generate problems deriving from the natural demand for basic services, such as water, electricity, roads, and land for urban expansion.
Sierra Nevada National Park: cooperation with traditional inhabitants

Management of the Park

This panorama of conflicts and contradictions between Nature, society, and the State was managed by the National Institute of Parks (Instituto Nacional de Parques, INPARQUES), the National Guard (Guardia Nacional: Fuerzas Armadas de Cooperación), and the Ministry of the Environment and Renewable Natural Resources (Ministerio del Ambiente y de los Recursos Naturales Renovables), with a unified application of the set of laws and regulations relating to the protection and management of national parks. This apparently correct enforcement caused misunderstanding and alarm among the population affected by the legal restrictions. In the first place, the flora and fauna were considered to be the only things to have priority for conservation, even in lands traditionally occupied by indigenous farmers, when, in fact, the most valuable resources in such “cultural areas” are the traditional agricultural techniques, engineering, and architecture.

The policy of restriction and repression to achieve the protection of Sierra Nevada National Park has prevailed over the possibility of a multiple-use management that would take into account the characteristics, resources, nature, and history of the landscapes. This led to the establishment of the general principle that inhabitants were a hindrance to the preservation of national parks and should be transferred to areas outside of the Park, under improved conditions wherever possible, according to current legislation on this subject.

The reaction of the inhabitants and of the civil, political, and religious organizations of the area was one of rejection, expressed at the local, regional, and national levels through the radio, print media, and television. As a result, the relations between the inhabitants and INPARQUES officers degenerated from anger and disobedience to cases of violence and attacks against park wardens, vehicles, and installations. When the conflict was at its peak, a proposal was put forward to exclude the occupied sectors from the National Park. At the same time, a research program was being developed by INPARQUES with the Institute of Geography and the Schools of Forestry Training and Forestry Engineering of the University of the Andes in Merida. The general objectives of this program were to test the application of methods of national park management.

The first efforts of this program involved the testing of natural resource inventory techniques at a level of detail appropriate for cartography and data management (Petit, 1984; Abreu / Zerpa, 1985; Molina, 1986; Rangel / Duque, 1987; Reyes, 1990). Subsequent work included an inventory of natural and socio-cultural resources, integrated ecological and agricultural evaluation, and zoning for regulation (García / Pérez, 1989; Aguilar / Manrique, 1989; Rincón, 1991; Díaz, 1990; Rodríguez, 1991; Castillo / López, 1991; Uzcátegui, 1991). One of the most significant results of this work is the full endorsement of the Park’s creation, based on the existence of relatively undisturbed biological resources, traditional cultures, and landscapes of great scenic value. These conditions and resources required a new approach that
would facilitate the coordination of the various uses of the Park. The new objective of the program is to study the possibility of integrating natural resource conservation with tourism, recreation, and community development.

**Regulation options**

The research program generated a series of proposals for managing the above conflicts, including a trial application of a draft of the Partial Regulation of the Land Regulation Law on Administration and Management of National Parks and Natural Monuments (Reglamento Parcial de la Ley Orgánica para la Ordenación del Territorio sobre Administración y Manejo de Parques Nacionales y Monumentos Naturales; García / Pérez 1989; Aguilar / Manrique, 1989), which was subsequently approved by the government (Decree N° 276 dated June 07, 1989). Application of these regulations led to a zoning, in which all uses of the specific resources of each landscape unit are either compatible with the conservation of these resources, or are prohibited. At the same time, work was in progress on dissemination of information, discussion, and dialogue between the professional and technical team of the Sierra Nevada National Park Superintendency and the inhabitants and users of the Park. The agreements and solutions reached in these discussions were instrumental in achieving more effective zoning for park protection and management. They included:

- recognition of areas of traditional agriculture;
- recognition of cultural values;
- determination of the permitted extensions and appropriate levels of technology in agriculture and livestock-grazing within the Park;
- the inhabitants' recognition of the national park status of their lands;
- the inhabitants' recognition of the benefits of resource protection and management and of land tenure stability and guarantees.

Some problems still remain to be solved, such as the incompatibility of extensive livestock-grazing with the conservation of fragile, unique, or very small biotic communities (e.g., the páramos and the desert-like areas surrounding the glaciers). A possible solution to this problem could be the reduction of the need for such vast grazing areas through intensive forage production in certain areas. Mechanization is suggested as a way to reduce the number of horses, mules, and oxen presently required for different tasks. Firewood extraction for cooking and heating, particularly at higher altitudes, has now become a minor problem with the widespread use of kerosene and liquefied natural gas, which, in turn, is a result of improved roads and paths. Many road improvements were made at the initiative, and through the efforts of, the inhabitants themselves (in defiance of the park authorities). INPARQUES later modified its position in this respect and there is now greater control, but also greater understanding and cooperation in cases of roads considered desirable because of the benefits they bring to the inhabitants and for the Park itself.
In areas of traditional agriculture, which are almost devoid of natural vegetation, priority is now given to the control of pollution and erosion, and to the preservation of villages and traditional structures. The tolerated and planned extraction of local construction materials produces social benefits by permitting the improvement of buildings and, at the same time, guarantees the survival of traditional architecture. The conservation and development of settlements and villages, along with incentives to build family inns for tourism, are today of growing interest to INPARQUES and the local population. Modified park politics and management resulted in the declaration of a “traditional inhabitant zone” (zona de uso poblacional autóctona), which permits the long-term settlement and controlled use of natural resources by the traditional inhabitants of the area. By this, a mutual understanding of the interests and aspirations of both the park administration and the inhabitants was achieved.
References


Díaz, Luis (1990): Inventario de recursos naturales y zonificación para la conservación de las cuencas secas de los ríos Tostos, La Vizcaina y San Pablo. Special Degree Paper. School of Geography, College of Forestry Science, University of the Andes, Merida.


Venezuela. Photos 69/70: In the high altitudes of Sierra Nevada National Park, the Andean grasslands and "páramos" (with Espeletia schultzii) are traditionally used for cattle grazing. Since 1989, the traditional farmers that have been living in the area for more than 50 years, have been allowed to continue their land use within specially declared "traditional population zones".
Venezuela. Photos 71/72/73/74: Los Roques Archipelago Marine National Park in the Venezuelan part of the Caribbean Sea covers more than 50 islands, hundreds of sand banks, lagoons, vast mangrove areas, and coral reefs. Its inhabitants are mostly fishermen. Huge heaps of "botuto" queen shells (Strombus gigas) indicate the enormous harvest of these molluscs, that have been extracted since pre-columbian times. This and the overfishing of the spiny lobster (Panulirus argus) have almost led to the extinction of these colorful marine species.

Venezuela. Photo 75: In Mochima National Park on the eastern coast of Venezuela, graffiti shows the severe conflicts between the local fishermen and the park administration (1990). Photos 76/77: In Avila National Park, a mountain ridge next to the metropolis of Caracas, the National Guard pulls down the precarious dwelling of an illegal squatter. Before such an action is taken, careful investigations are made to establish whether the farmer is entitled to claim compensation for the improvements he has made. Traditional farmers of long standing are allowed to remain in the Park within special zones.
LA POLÍTICA DE INPARQUE ES SUCIA Y ABSURDA
Venezuela. Photos 78/79: The "policy of understanding" between the national park authorities (INPARQUES) and local inhabitants and resource users includes the organization of regular meetings and public consultation workshops, in this case, for the elaboration of a management plan for Duida-Marahuaca National Park in the Amazon Territory.


Rincón, Juan (1990): Inventario de recursos físico-geográficos en la vertiente sur del Parque Nacional Sierra Nevada. Special Degree Paper. School of Geography, College of Forestry Science, University of the Andes, Merida.

Rodríguez, Militza (1991): Diagnóstico geográfico para una propuesta de zonificación en un sector de la vertiente norte del Parque Nacional Sierra Nevada. Special Degree Paper. School of Geography, College of Forestry Science, University of the Andes, Merida.


Legal documents


Balance Sheet

Inhabitants in national parks - an unsolvable contradiction?

Stephan Amend
Thora Amend
Abstract: The New Delhi definition of national parks calls for unaltered and uninhabited natural areas. However, the general panorama in South America shows that in most cases (85.9%) it has not been possible to accomplish this national park ideal. The degree of environmental impact that the local population or resource users cause, nevertheless, varies in each park and with each group of inhabitants. The majority of national park administrators have not been trained to deal with these people or to handle conflictive situations and lack the necessary financial resources, personnel, and institutional support. Taking into account the political and social realities of South American countries, there are two options for the future of national parks: prompt relocation of inhabitants (for urgent ecological reasons), with the consent of the affected parties; or integration of local populations into the park concept, with the establishment of continuous environmental education and awareness programs and at the same time seeking alternative sources of income that will reduce the pressure on natural resources.

In 1977, the Venezuelan National Guard (Guardia Nacional) demolished some dwellings that the National Parks Administration had taken over at Galipán, a village in El Avila National Park. The local inhabitants, fearful for the future of their village, confronted the authorities. They publicly expressed their disagreement with the park policy in an open letter: “For several years now EVERYTHING, absolutely everything, is prohibited. It is prohibited to build or improve our houses. It is prohibited to repair paths, build water tanks, or install water pipes. It is prohibited to open up and use pastures, burn garbage, and even to prune our fruit trees”.

The people of Galipán felt they had been deprived of their most elementary rights, and they therefore implored the President to imagine himself to be a child of the community, compelled to grow up in circumstances that would oblige him constantly to break the law in order to lead a more or less normal life.

What was the problem? What happened in El Avila National Park? In order to understand the conflict that exists in many of the world’s national parks between the inhabitants of these protected areas, their surroundings, and the agencies responsible for park administration and protection, it is necessary to analyze the national park concept and how it has changed in the course of time.
Evolution of the national park concept

The world’s first national park was created in 1872, at Yellowstone in the United States of America. The country was in the midst of a land distribution process. Vast regions formerly considered common property were privatized and closed to public access. There were reports of damage to the landscape and natural resources due to exploitation by inexperienced and sometimes unscrupulous people. At the same time, the growing urban population was demanding places for recreation and leisure (Harroy, 1972; Coolidge, 1972).

During an expedition, the scientist Washborn and his companions reached the Yellowstone River Valley. The exceptional beauty of the landscape led them to develop the idea of preserving the area for Mankind, that is, for the public in general, without distinctions of class or origin, and protecting it for the enjoyment of future generations. This concept became famous in the present century as the Yellowstone Manifest and had a fundamental influence on the movement in defense of protected natural areas.

The Yellowstone Manifest states that the protected area, located near the upper course of the Yellowstone River “is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people; and all persons who shall locate or settle upon or occupy the same, or any part thereof, except as herinafter provided, shall be considered trespassers and removed therefrom” (U.S. Department of the Interior, 1933).

The term “national park” was chosen because the term “park” is understood as an area placed under protection for enjoyment by the population; the word “national” was used to describe an area that is the property of the nation and is administered by the national government. Other national parks were subsequently created, in presumably uninhabited regions of Canada, Australia, and New Zealand. These countries were facing problems similar to those of the United States, due to the waves of immigrants that were then arriving, particularly from Europe.

The first protected areas and national parks in South America were created on the initiative of a few people devoted to conservation, such as Francisco P. Moreno in Argentina and Henri Pittier in Venezuela. In order to be successful in his mission to promote the creation of the first national park in Venezuela, Pittier made use of highly pragmatic arguments to convince politicians of the need to establish protected areas. In a memorandum written by him in 1937, Pittier spent little time on making enthusiastic comments on the natural beauties of the area, but instead emphasized the enormous importance of forests in protecting against erosion, irregular water flow, extreme temperature variations, and excessive wind speed. The botanist also emphasized that regulated, state-controlled use would be of benefit to forestry and therefore, indirectly, to agriculture (Pittier, 1937).
Internationally, however, there was no clear idea as to how a national park should be administered and managed, although national parks already performed important land planning functions. The fact that each country adopted different national park concepts according to its own historical, social, and geographical conditions gave rise to an attempt, beginning in 1930, to seek unification, in concepts and in practice, through international nature protection agreements. The Washington Convention (Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere) was signed in 1940, with the idea that the signatory countries should undertake efforts to establish new protected areas in their respective territories. It was also an effort to unify the terminology and objectives of the different protected area categories. In the Convention, it was agreed to use the term 'national park' only for an area that is "established for the protection and preservation of superlative scenery, flora and fauna of national significance which the general public may enjoy and from which it may benefit when placed under public control" (OAS, 1940). With the general approval of the Washington Convention, ratified by all South American countries except Guyana and French Guiana, a very important international law had been created with considerable influence on nature protection legislation.

The International Commission on National Parks (ICNP) was set up by the IUCN (International Union for the Conservation of Nature and Natural Resources, founded in 1948, now: The World Conservation Union) in 1958, among other things, to make an inventory of the parks created throughout the world. Support from the United Nations (UN) was acquired for preparation of this list, and the participants at the First World Conference on National Parks (held in Seattle in 1962)
contributed on more detailed criteria for classification of protected areas, mostly based on the principles for the establishment of national parks in North America (Packard, 1972).

The basic principle stated that “To qualify as a national park or equivalent reserve, an area should enjoy general legal protection against all human exploitation of its natural resources and against all other derogation of its integrity resulting from human activity. While some departures from this principle may in practice have to be allowed, they should be very exceptional and always treated as exceptions.”

Points 9 and 11 of the explanatory comments indicated that “Exceptions may be justified to cover private rights which existed before the reserve was created, such as residential rights or rights to practise agricultural, pastoral, mining or quarrying activities, always provided that these rights are confined to a small part of the area. They should seldom be permanent and their redemption or termination should be anticipated in the long term. (...) In circumstances such as those described, it is impossible to cover the status of a protected area by a single definition; it would be necessary to invoke the ‘zoning principle’ and give as full details as possible of the particular situation” (ICNP, 1963).

One of the chief reasons for the ICNP’s desire to introduce the zoning principle, thus also accepting the existence of human settlements in protected areas on a temporary basis at least, was to be able to include in the UN/IUCN list the extremely large national parks which undoubtedly protect large portions of important ecosystems but in some places are inhabited or exploited by Man (Forster, 1973).

At the 10th General Assembly of the IUCN (held in New Delhi, India, in 1969), the IUCN attempted to establish a single, permanent, worldwide definition of national park: “A national park is a relatively large area (1) where one or several ecosystems are not materially altered by human exploitation and occupation; where plant and animal species, geomorphological sites and habitats are of special scientific, educative and recreative interest, or which contains a natural landscape of great beauty and (2) where the highest competent authority of the country has taken steps to prevent or to eliminate as soon as possible exploitation or occupation in the whole area and to enforce effectively the respect of ecological, geomorphological or aesthetic features which have led to its establishment and (3) where visitors are allowed to enter, under special conditions, for inspirational, educative, cultural and recreative purposes” (IUCN, 1990).

The Second World Congress on National Parks (held at Yellowstone and Grand Teton in 1972) confirmed this national park definition, today accepted by most countries and used as a model for national legal provisions. Nevertheless, delegates at the 10th General Assembly of the IUCN had already expressed some criticism of the fact that the national parks, per se, only protected natural landscapes without human alteration (Henke, 1976). At IUCN’s 11th General Assembly (Banff, Canada, 1972), some explanatory notes were added to the New Delhi definition to allow for a tiered system of protection zones in national parks. The following zones were agreed upon, applicable worldwide (cf. IUCN, 1977; Introduction):
1. Protected natural zones:
   a. Strict natural zone.
   b. Managed natural zone.
   c. Wilderness zone.
2. Protected anthropological zones:
   a. Natural biotic zone.
   b. Cultivated landscape.
   c. Site of special interest.
3. Protected historical or archaeological zones:
   a. Archaeological sites.
   b. Historical sites.

Although the New Delhi definition of a national park was guided by the Washington Convention, the national park concept was amplified with the zoning principle whereby certain groups of inhabitants may be recognized as part of the ecosystem (through the acceptance of “protected anthropological zones”) if they perform traditional agriculture adapted to the natural environment that is considered worthy of being preserved and protected as cultural heritage.

Since the declaration of national parks or other protected areas could lead to the expulsion or forced relocation of ethnic groups, the IUCN pointed out at its 12th General Assembly (Zaire, 1975) that “the establishment of protected areas should not lead to the dislocation of native peoples and their indigenous life-style should not be disrupted, providing that these in themselves do not lead to the reduction of the ecological integrity of the area” (Eidsvik, 1990).

What was to be done, however, with the inhabitants of a national park who neither belonged to an ethnic group nor lived in a “protected anthropological zone”, noteworthy for their ancient way of cultivating the land? In this regard, the 1982 and 1985 UN/IUCN lists specify that “It is recognised that within the boundaries of certain national parks there are existing villages, towns, communication networks, and the on-going activities connected with them. Provided that these areas do not occupy a significant part of the land and are de facto zoned and so arranged that they do not disturb the effective protection of the remaining area, they will not be considered as a basis for exclusion from this category. Similar considerations apply in regard to private rights which existed before the reserve was created, such as residential rights or rights to practise agricultural, pastoral or mining activities, always provided that these rights are confined to a small part of the area. They should not be permanent and their redemption or termination should be anticipated in the long term. The general requirement against exploitation must be rigidly enforced” (IUCN, 1985). While recognition of the existence of human settlements in small areas of the park was maintained, the latter three sentences were removed from the IUCN list (1990).

The current national park definition approved in New Delhi and the above explanatory notes on use of resources establish the official guidelines for an inter-
nationally coordinated policy on this protected area category. However, due to the variety of documents, sometimes contradictory, it is difficult to understand all the aspects and official rules for national park management. Particularly for young national park administrators who have not witnessed the lively discussions of past decades, the management options recommended in official publications often seem to be limited to the phrase, "where the highest competent authority of the country has taken steps to prevent or to eliminate exploitation or occupation in the entire area as soon as possible."

The requirement of eliminating all occupancy or use is still maintained in various publications. Based on the work of the task force on categories, set up by the Commission on National Parks and Protected Areas's (CNPPA, ICNP's successor), IUCN in 1990 circulated the Framework for the Classification of Terrestrial and Marine Protected Areas, which seeks to review the protected natural area categories. This document again asks the national park authorities "to eliminate any exploitation or intensive occupation of the area" (Eidsvik, 1990).

Even accepting a totally uninhabited area as the "national park ideal" and advocating management activities that tend to strengthen integral conservation of the environment, it must be recognized that the radical elimination of human occupancy as the only management strategy explicitly referred to on paper does not correspond to the realities to be found in the majority of the world's national parks. As the examples and case studies in this volume clearly reflect, over-restrictive management may often even be self-defeating for conservation purposes. It therefore appears essential to reactivate or strengthen the zoning principle, which in well-defined cases permits the long-term presence of human settlements with maximum involvement in national park management. In some cases, however, the exceptional and unique value of an ecosystem or particular species may justify relocation of human groups. In such cases, positive solutions should be sought with the collaboration of the inhabitants in question.

To avoid errors or misunderstandings and to create a clear legal basis at international level, a joint document should be drawn up including the New Delhi national park definition and all subsequent rules and current explanatory notes. This document should be translated into the most important languages and be approved again by CNPPA and by the participants at the IUCN General Assembly.

South American national parks and human occupancy

When, in 1991, we asked throughout South America, "What are your national park's three main problems?" the representatives of the oldest national parks of each country replied as follows:
- Chile, Vicente Pérez Rosales (declared in 1926), problem No. 1: "Land tenure, existence of private property and occupants."
Guyana, Kaieteur (1929), problem No. 3: “Illegal activities such as occupation and mining.”
- Argentina, Nahuel Huapi (1934): problem No. 1: “A large area affected by grazing and private property.”
- Brazil, Itatiaia (1937), problem No. 1: “Land ownership not clarified.”
- Venezuela, Henri Pittier (1937), problem No. 2: “Squatters.”
- Bolivia, Cerro Sajama (1939), problem No. 1: “Total lack of management.”
- Ecuador, Galápagos (1959), problem No. 1: “Pressure by animals introduced by inhabitants.”
- Colombia, Cueva de los Guácharos (1960), problem No. 1: “Public order; drug traffickers and guerrillas,” problem No. 3: “settlements.”
- Paraguay, Tinfunque (1966), problem No. 1: “The park has been established on privately owned lands.”
- Peru, Manú (1973), problem No. 3: “Policies not updated with respect to native groups.”

Although many South American national parks have been in existence for several decades, conflicts with local inhabitants over agricultural activities, illegal occupation and use of the protected areas continue to be central problems (Table 2).

The present IUCN project “Inhabitants in the national parks of South America”, funded by the German Agency for Technical Cooperation (GTZ), was initiated in 1990. Its objective was to document the political and administrative concepts that had been developed in the different South American countries with regard to the problem of inhabitants in parks, as well as the actions planned for the future. The project was extremely well received, as indicated not only by the volume of replies to the national park questionnaires (73.4%), but also by the active participation of the 44 outstanding professionals in the nature conservation field in South America who described the situation in their respective countries and whose reports are published in this work.

The scope of the study included all of the 184 national parks in South America that had been declared by 1991. The analysis were based on questionnaires, articles, lectures, and other recent informative material distributed by the national park administrations or non-government organizations in the different countries. According to this study, only 26 South American national parks (14.1%) can be considered as completely uninhabited. This means that 158 national parks (85.9%) are faced with the problem of human occupancy or use of their resources, either permanently or temporarily. Nevertheless, the great majority of South American national parks fulfill the conditions traditionally required of a national park, that is, they possess large pristine, or at least uninhabited, areas and maintain a certain percentage of their lands under total protection (Table 3).

Although almost 86% of South American national parks are directly affected by inhabitants or resource users, this does not automatically imply a serious situation for these protected areas. The proportion of inhabited areas and the degree of environmental impact vary with the park and even with the ethnic group (see Figures 1
Table 2

South America: principal problems in national parks

Answers from national park managers to the question: "What are the three principal problems of your park?" *

<table>
<thead>
<tr>
<th>Problem</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraction of natural resources</td>
<td>33.1 %</td>
</tr>
<tr>
<td>Lack of (qualified) staff</td>
<td>27.0 %</td>
</tr>
<tr>
<td>Land tenure not clarified</td>
<td>21.6 %</td>
</tr>
<tr>
<td>Agriculture and grazing</td>
<td>20.3 %</td>
</tr>
<tr>
<td>Poor park planning</td>
<td>16.9 %</td>
</tr>
<tr>
<td>Illegal occupancy</td>
<td>16.9 %</td>
</tr>
<tr>
<td>Inappropriate or undefined park boundaries</td>
<td>16.2 %</td>
</tr>
<tr>
<td>Insufficient control</td>
<td>16.2 %</td>
</tr>
<tr>
<td>Fires</td>
<td>12.8 %</td>
</tr>
<tr>
<td>Legal occupancy</td>
<td>12.2 %</td>
</tr>
<tr>
<td>Lack of financial resources</td>
<td>11.5 %</td>
</tr>
<tr>
<td>Lack of infrastructure</td>
<td>11.5 %</td>
</tr>
<tr>
<td>Settlement of areas surrounding the park</td>
<td>10.8 %</td>
</tr>
<tr>
<td>Mining and petroleum operations</td>
<td>10.1 %</td>
</tr>
<tr>
<td>Excessive impacts of tourism</td>
<td>8.8 %</td>
</tr>
<tr>
<td>Lack of political and institutional support</td>
<td>6.1 %</td>
</tr>
<tr>
<td>Pollution</td>
<td>6.1 %</td>
</tr>
<tr>
<td>Development of national infrastructure that conflicts with conservation</td>
<td>5.4 %</td>
</tr>
<tr>
<td>Guerrilla activity and / or drug trafficking</td>
<td>4.7 %</td>
</tr>
<tr>
<td>Introduction of exotic species</td>
<td>2.7 %</td>
</tr>
</tbody>
</table>

* Percent of national parks recorded with this problem (N=148)

...and 2). In general, both the extension of the affected area and the degree of disturbance caused are difficult to evaluate. Only in a few parks have reliable studies been carried out on this subject. Moreover, only 29.3% of South American national parks have management plans that might be able to provide information. Nevertheless, management attention should be given to all population groups, even though they might be using only a small part of the national park: in the first place because it is desirable to avoid expansion of the inhabitants' activities or their negative influences on the parks' core areas, and secondly, because the justified demands of the people who lived in the park area prior to its creation cannot be ignored.

Socio-economic structure of population groups

In over 50% of South American national parks, there are poor, subsistence farmers who try to make a living on very small lots. Since they are unable to invest in machinery, they use rudimentary farming techniques that do not require large capital investments. Their agricultural production only marginally affects their countries' economies (Figure 3). There is, however, no 'typical' national park...
inhabitants; there are too many different natural and cultural factors that influence these peoples' activities. Even within a single park or village there are inhabitants who require individual solutions because of their socio-economic differences (cf. the article in this volume by Myers / Uribelarrea).

In general, however, national park inhabitants are not very different from the population groups that live outside of protected areas under similar living conditions. They therefore have to face the widespread problems of the South American rural population: unemployment, poverty, small farmsteads, and destruction of the environment (cf. article by Araya / Cunazza).

### National parks and indigenous reserves

Not only is South America a fascinating continent from a biological and scenic point of view, it is also the home of a multitude of ethnic groups with widely differing languages and customs. Since most of these groups live in remote regions and official languages seldom coincide with tribal languages, it is quite usual for indigenous peoples to remain unknown even in their own country, or to play no part whatsoever in the political or economic life (cf. articles by Marconi / Donoso and by

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**Table 3**

South America: status of national parks by country (1992)

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of N.P.</th>
<th>without inhabitants or use</th>
<th>with temporary use</th>
<th>with permanent use</th>
<th>with inhabitants and use</th>
<th>Management Plan</th>
<th>Zoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>16</td>
<td>6</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Bolivia*</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Brazil</td>
<td>34</td>
<td>5</td>
<td>1</td>
<td>28</td>
<td>29</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>Colombia</td>
<td>33</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>19</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Chile</td>
<td>30</td>
<td>11</td>
<td>5</td>
<td>14</td>
<td>19</td>
<td>3</td>
<td>3</td>
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<td>Ecuador</td>
<td>6</td>
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<td>0</td>
<td>5</td>
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<td>4</td>
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<td>French Guiana</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Guyana</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Paraguay</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Peru</td>
<td>7</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Suriname</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Uruguay</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Venezuela</td>
<td>39</td>
<td>0</td>
<td>3</td>
<td>36</td>
<td>39</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>184</strong></td>
<td><strong>26</strong></td>
<td><strong>12</strong></td>
<td><strong>146</strong></td>
<td><strong>158</strong></td>
<td><strong>54</strong></td>
<td><strong>44</strong></td>
</tr>
<tr>
<td><strong>% of total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>14.1</strong></td>
<td><strong>6.5</strong></td>
<td><strong>79.3</strong></td>
<td><strong>85.9</strong></td>
<td><strong>29.3</strong></td>
<td><strong>23.9</strong></td>
</tr>
</tbody>
</table>

* the protected areas indicated by Marconi / Donoso are taken as a reference
Castaño Uribe). One of the most frequent disadvantages indigenous people face is the fact that most of them do not hold land titles to their ancestral lands, or other mechanisms to defend their lands against intruders. Laws preserving cultural individuality have been created in some countries to protect these minority groups, for example, in Suriname (cf. article by Baal) and Brazil (cf. article by Brant Rocha).

It is in Colombia that the greatest efforts seem to have been made to link the protection of Nature with the conservation of cultural values, by superposing the legal mechanism of resguardo indígena (lands with communal titles held by the indigenous peoples) on the legal mechanism of national park in 16 cases (cf. articles by Castaño Uribe and Villa). Great efforts are also being made in Argentina (e.g. Lanín National Park, cf. article by Osidala / Romero / Corvalán) and Chile (Volcán Isla/ and Lauca National Parks, cf. article by Araya / Cunazza) to involve the indigenous population in national park management.

Privately owned lands in national parks

Cases of privately owned lands in national parks present a special problem. In theory, the possibility of expropriating such lands exists in most South American countries, and the case study on Guatopo National Park in Venezuela shows that this can be a feasible alternative (cf. article by Yerena / Escalona). In general
practice, however, the financial resources and the political will to do this are often lacking. In his article, Pérez Hernández of Venezuela points out the problem of "denaturalization of ownership" due to owners being deprived de jure of their right to the free use and enjoyment of their property, and the fact that the denial of these rights is not even materially compensated. For Argentina, on the other hand, María Fourcade de Ruiz describes another legal extreme: "Ownership rights (...) are characterized by being exclusive and perpetual and entitle the owner to hold the property, use and enjoy it at will, void it, degrade it, or destroy it." By virtue of this right, in Argentina an owner may deny the park authorities access to his lands, thus preventing efficient management. To avoid new problems, in Chile it was agreed not to include privately owned lands in national park projects unless their immediate acquisition is guaranteed (cf. article by Araya / Cunaza).

Nevertheless, the fact remains that about 50% of national parks in South America have been created at least partially on privately owned land. Pérez Hernández, who sees little probability of any drastic change in this situation in the near future due to financial, political, and social realities, proposes a review of the exclusive nature protection concept in national parks as provided by the Washington Convention and the a priori prohibition on the commercial use of resources. Instead, he suggests that more attention be given to legal provisions that do not simply assign all rights to owners but rather make them feel obligated and responsible for their environment, while allowing them to make controlled commercial use of their property.
Inhabitants versus squatters

The inhabitants of a national park who have been living in the area since before its declaration should be clearly distinguished from the squatters who settled there afterwards. The reference date in such cases is usually the date of the decree creating the park. As long as the authorities have not carried out an expropriation with its respective compensation, the local dweller has the right to live in his house or hut, whether he has title to the land or not. The decree that creates a national park cannot invalidate previous legal provisions such as use and property rights. Certain regulations may be imposed, however, as regards rational and sustainable use of the natural resources (cf. article by Ferrando).

On the other hand, there is no doubt that an occupant who invades a national park area in order to settle there or make use of its resources is breaking the law. Land use planners may therefore take advantage of the national park mechanism as a legal instrument to prevent any exploitation or housing development.

However, this legal instrument is valid only if the State takes immediate action to prevent such squatters from establishing themselves. In order to protect poor farmers who have settled on vacant land from being driven out by the landowner after they have made great efforts to cultivate it, the legal situation in the majority of South American countries is as follows: if the landowner has not taken any action to claim his rights within one year following settlement (or some other duly specified
period), he may still subsequently demand that his land be vacated, but he must pay the occupant for his “improvements”, namely, all the materials and work the latter has invested in the land. This law also applies to national parks, and therefore, if action is not taken in due time, the protected area administrators must foresee heavy expenditures for indemnities. There are, of course, certain people who knowingly take advantage of this legal situation for monetary gain (“squatters in bad faith”), but there are also others who, in the search for a way to make a living for themselves and their families, unwittingly invade a national park area (“squatters in good faith”, cf. article by Castaño Uribe). While it has been clearly established in some countries, e.g. Brazil, that there will be no recognition of any claim made by squatters in national parks (cf. article by Wiedmann), there are also insufficient financial resources and personnel to enforce a strict policy in protected areas (cf. article by Schenkel / Kaniak).

Conclusion

Since the legal situation is not very clear, most national park administrators have not been trained to deal with inhabitants and therefore have only a vague idea of the possible future of these groups and their relations with protected areas. Some administrators have had creative ideas on this subject, but generally lack the financial resources, personnel, or institutional support necessary to put their ideas into practice. It is quite usual for large nature protection projects to provide funds for the study of the flora and fauna only, without including any analysis of the situation of the local inhabitants (cf. article by Moscoso).

Lack of constancy in technical and personnel matters, repeated changes in administrative orientation, and repeated failures in the search for solutions, have resulted in a loss of trust and credibility on the part of local populations. Thus, for example, the following paragraph appears in the management plan for Los Alerces (Argentina, 1986): “Special recommendation: In view of the innumerable times that various National Park Administration officers have talked to the inhabitants, in general and in particular, generating hopes which in almost all cases still remain unfulfilled, the first and basic proposal on this subject is to refrain from doing this again until a final decision is made and the financial resources are available to start implementing at least some of the proposed options.”

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

1. prompt relocation of inhabitants (for urgent ecological reasons), with the consent of the affected parties; or
2. integration of local inhabitants into the park concept, with the establishment of continuous environmental education and awareness programs, and at the same time seeking alternative sources of income that will reduce the pressure on natural resources.
Serious, creative, and even original efforts in this connection are being made in nearly all South American countries, as can be seen from the studies presented in this volume. In most cases, however, they are due to the merits of individual persons and interested groups, who are too small in number to deal with this enormous task.

To be able to confront all the difficulties and improve the situation, the position of national park officer (administrators and park wardens) should be "professionalized" and better paid. The future of parks depends to a great extent on the recruitment of personnel willing to work together with the local inhabitants in the protection of Nature and the conservation of scenic beauties for future generations.

Editorial update: The 14th World Congress on National Parks and Protected Areas held in Caracas, Venezuela (February 1992), was undoubtedly the most significant event for managers of nature protection in recent years. Its objective was to define the role of protected areas within a healthy relationship between people and the rest of Nature. Most of the authors of this book participated in the Congress and enriched the discussions with their experiences, especially in the workshop on one of the Congresses' main themes: people and protected areas. The experience of the Congress was summarized in the official document, "Parks for Life" (IUCN 1993) as follows:

"As Sir Shridath Ramphal (former President of IUCN) observed in his opening address, protected areas cannot co-exist with communities which are hostile to them. But when placed in a proper context, protected areas can make significant contributions to human welfare. The Congress agreed that protected areas must be socially responsive and just. It devoted considerable effort to adding specifics to the general point that social, cultural, economic, and political issues are not peripheral to protected areas, but central to them. Many protected areas face pressure from increasing populations whose economic well-being has suffered from cumulative neglect of land and other resources. For protected area managers, detailed knowledge of the people whose lives are affected by the establishment and management of parks is as important as information about the plant and animal species to be conserved. The cultural and socio-economic characteristics of local people, including the age and gender division of labor, form the basis for measures to promote the sustainable use of natural resources, alleviate poverty, raise the quality of human life and create positive support for protected areas. Participants at the Congress often had direct experience of conflicts between different uses for lands important for conservation, or between different economic powers with different objectives. The Congress therefore gave considerable attention to new approaches to resolving conflicts. It concluded that the most important step is to get all sides of a conflict to sit down and try to recognize the validity of the opposing views. It is also important to identify the various stakeholders involved in the conflict and their interests. While conflicts will not go away, the Congress will lead to guidelines to help protected area managers become more effective in dealing with the conflicts which are an inevitable part of modern management. The Congress
recognized that human communities, especially those living in and around protected areas, often have important and long-standing relationships with these areas. Local and indigenous communities may depend on the resources of these areas for their livelihood and cultural survival. Increasingly, the resources which justify establishment of protected areas include cultural landscapes and adapted natural systems created by long-established human activity. These relationships embrace cultural identity, spirituality, and subsistence practices, which frequently contribute to the maintenance of biological diversity. Protected areas are thus to be seen as making important contributions to conserving cultural as well as biological diversity. The relationships between people and land have too often been ignored and even destroyed by well-intentioned but insensitive resource conservation and management initiatives. The Congress called for community participation and equality in decision-making processes, together with mutual respect among cultures to be achieved urgently. Customary tenure systems, traditional knowledge and practices, and the role of men and women in communities, must be respected and built upon in designing and implementing conservation plans. At the same time, community involvement does not mean opening the national parks to all comers, any more than a banker would seek customers by opening the vault. Rather, a wise protected area manager, like a wise banker, uses the park's assets as a base upon which to build customer satisfaction, investment, and interest.

Recommendation 17 of the Congress affirmed the need for a revision of protected area management categories, which led to considerable changes in the definition of national parks and the promotion of a new category VI, the "managed resource protected area". These changes were adopted by the XIXth General Assembly of the IUCN (held in January 1994 in Buenos Aires, Argentina) and published in the "Guidelines for Protected Area Management Categories" (IUCN, 1994).

The basic concept defines a protected area as: "an area of land and/or sea specially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means."

This definition embraces all kinds of natural protected areas. Nevertheless, the precise purposes for managing different areas may differ greatly. These range from scientific research, protection of specific natural and cultural features, and sustainable use, to tourism, recreation, and education. According to the main management objectives involved, the following distinct categories of protected areas have been identified:

I  Strict Nature Reserve/Wilderness Area (strict protection),
II  National Park (ecosystem conservation and recreation),
III  Natural Monument (conservation of natural features),
IV  Habitat/Species Management Area (conservation through active management),
V  Protected Landscape/Seascape (landscape/seascape conservation and recreation),
VI  Managed Resource Protected Area (sustainable use of natural ecosystems).

The newly introduced Category VI responds to the request brought forward by many experts during the IVth World Congress, that a category was needed to cover predominantly natural
areas that are managed to protect their biodiversity in such a way as to provide a sustainable flow of products and services for the community. The principal management purpose of the new category is the sustainable use of natural ecosystems and the long-term protection and maintenance of biodiversity. To qualify for inclusion in this internationally accepted category, at least two-thirds of the area must remain in its natural state. The Managed Resource Protected Area does not correspond directly with any of the categories in the 1978 system, although it includes some areas previously classified as "Resource Reserves", "Natural Biotic Areas / Anthropological Reserves", and "Multiple Use Management Areas / Managed Resource Areas".

Since all categories of protected areas are equally important, IUCN encourages its member countries to develop systems of nature conservation areas that meet their country's own natural and cultural heritage objectives. Each of the six proposed categories fills a particular "niche", in terms of management and administration, and, therefore, all countries should consider including the full range of management categories in their systems. These categories can be adapted to each country's needs and given names that are easily understood by its citizenry.

Though the primary purpose of management determines the category to which an area is assigned, different management zones may be established within each protected area, to allow for a variety of purposes that take account of local conditions. In order to establish the appropriate category, however, IUCN recommends that at least three-quarters (and preferably more) of the area should be managed for the primary purpose; and the management of the remaining area should not be in conflict with that primary purpose. Protected areas of different categories are often contiguous, sometimes with one category "nested" within another. This is entirely consistent with the application of the system, providing such areas are identified separately for accounting and reporting purposes.

In the new "Guidelines" (IUCN, 1994) a national park is defined as: "a natural area of land and / or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation that is inimical to the assigned purposes of the area, and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible."

By only excluding uses if they are in conflict with the management objectives of the area, the new definition opens possibilities of legally recognizing those groups of inhabitants that are well adapted to their natural surroundings or do not cause major negative impacts. Thus, for instance, many of the indigenous groups and traditional farmers living within South American national parks (like in the Venezuelan "traditional population zones") may become internationally acceptable. Although this change of official definition may please some administrators of national parks and be a source of anger to others, the main management purpose for this category should always be kept in mind, and human settlements and resource use should only be tolerated as exceptions. If they substantially alter the environment, it might be advisable to consider re-classification of the protected area in question.
The South American situation

The protected area systems of the region are still growing. New national parks have been declared since 1992 in Argentina, Brazil, Colombia, and Ecuador. In French Guiana, where several protected areas have been established in other management categories (like in most South American countries), the plans for the creation of a first national park are progressing well. Institutional rebuilding occurred in Bolivia (with the creation of the National Administration for the Conservation of Biodiversity), Colombia (with the establishment of the Ministry of Environment), and Ecuador (with the creation of INEFAN). National strategies of how to improve the protected area systems were developed in Bolivia, Colombia, French Guiana, Guyana, and Paraguay. New legislations related to protected areas were approved in Bolivia (Environment Law), Chile (Indigenous Law, promoting the participation of indigenous groups in the management of protected areas), Paraguay (Law on Protected Areas), Peru (new Political Constitution, affecting land tenure and expropriations in protected areas), and Suriname (new forest legislation, establishing definitions for certain types of protected areas and setting rules for sustainable resource management). In Venezuela a National Parks and Natural Monuments Law is currently being prepared. Great advances in nature conservation also seem to have been made in Guyana, where a National Conservation Strategy and a proposed protected area system were developed.

Notwithstanding these changes and improvements, Marta Rojas, ex-Director of Colombian National Parks, in her analysis of Colombia’s protected areas summarizes a situation that seems to be common among the majority of South American countries:

"It is unquestionable that the creation of the System of National Parks was an enlightened step toward proper land use planning, without which a large part of Colombia’s cultural and biological richness would have been lost, along with the environmental services that these areas provide. The processes that are degrading Colombia’s environment (such as deforestation of between 400,000 and 600,000 ha per year, illegal use of natural resources, expansion of the agricultural frontier, and execution of development projects without environmental management) would surely have caused the disappearance of many of our natural areas that today marvel a growing number of visitors. Much of the country’s potential wealth that is housed in its enormous biodiversity would also have been lost. Nevertheless, it must be recognized that these achievements are much more the result of the isolation of these areas and the efforts of the few officials working in them, than the result of the effectiveness of the parks’ legal status, true political will, or the commitment of the country to protect these natural areas. Against a background of growing threats, it is all the more important to evaluate the real options for long-term conservation of the System, as well as to orient governmental policies for its management. (...) The rapid growth of the System was generally not accompanied by proportional strengthening of its management ability, especially when taken into account the human influences present in these areas. The principal limitation has been the low hierarchical position of the System within the government, along with the insufficient appropriation of funds and personnel" (Rojas 1994).
However, there is a positive attitude and a general willingness to improve the management of protected areas in the Region. Taking into account the fact that South America has less than 10% of the world's existing protected areas, but which nonetheless contain more than 15% of the planet's protected landscape (about 6.1% of the continent is under some type of protection), the IUCN members in South America have formed national committees and a regional committee, as well as task-forces to coordinate efforts. The first regional meeting was held in 1990 at Chorlavi, Ecuador, and was followed by meetings in Santa Marta, Colombia and Paraty, Brazil. In the Paraty Document, which was presented in Buenos Aires (1994), the more than 100 South American committee members agreed on the following:

"It is clear that South America will have to dedicate intense efforts to each country's protected areas, in order to avoid them being mere 'paper parks'. We must multiply not only the amount of personnel involved in management but also the quality of the services rendered. A few countries under heavy international financial obligations will find it difficult to muster enough resources to efficiently manage their protected areas. There will also have to be a greater effort to include those ecosystems which are not extensively represented, such as marine, Amazonian, Andean, and arid ecosystems. Fragile wetlands are also not well represented in South America's protected areas, especially if we consider their hydrological characteristics. It is likely that a strong network of protected areas can be developed on the Continent, making the most of the benefits of each national system, from qualified staff to the creation of international biological corridors" (IUCN, South American Members, 1993).

The Paraty Document was the first attempt to conduct a critical analysis of environmental issues in the Region. It presented ideas worthy of further discussion throughout the world and invited reflection on the role of South America in the conservation of the Earth's biodiversity. Many of the Region's over 300 million inhabitants are aware of the ecological importance of the land where they live, its potential, its difficulties, and the need to conserve its richnesses for future generations. Now is the time to join individual, national, and regional efforts and turn the many good ideas and initiatives in protected area management into solid reality.


IUCN (1994): Guidelines for Protected Area Management Categories. (CNPPA with the assistance of WCMC). Gland, Switzerland and Cambridge, United Kingdom.

IUCN, South American Members (1992): Memorias II. Taller Regional de Humedales. Paraty, Brazil.


Acevedo, Celeste. Paraguayan biologist, graduate of the National University, Asunción, Paraguay. She completed advanced courses in the conservation of natural resources and the management of protected areas, flora, and fauna at the Brazilian Agricultural Research Station (EMPBRAPA) of Corumbá, and coordinated the Conservation Data Center at the National Parks and Wildlife Bureau of the Paraguayan Ministry of Agriculture and Livestock. Presently she is completing her master's degree in CATIE, Costa Rica. Address: CDC (Centro de Datos para la Conservación), Dirección de Parques Nacionales y Vida Silvestre, 25 de Mayo 640, Edif. Garantía, Piso 12B, C.C. 3303, Asunción, Paraguay. Tel: ++595-21-494.914, 498.089. Fax: 495.568.

Amend, Stephan. A German geographer, graduate of Freiburg University, where he also presented his doctoral thesis on the management of a montane national park in Venezuela. Since 1985, he has been living and working in South America, mainly in Venezuela, analyzing the problems and opportunities of protected area management on a theoretical and practical level. Since 1992, he assists the Institute for Forestry, Natural Areas and Wildlife (INEFAN) on behalf of the German Technical Cooperation (GTZ) in the management of the extensive Cuyabeno Fauna Production Reserve, in the Ecuadorian Amazon. Address: PROFOR (Programa Forestal Sucumbios), Edif. MAG-INEFAN, Av. Amazonas y Eloy Alfaro, Casilla 17-21-546, Quito, Ecuador. Tel. and Fax: ++593-2-504.487.

Amend, Thora. German, with a master's degree in geography and cultural anthropology and a doctorate on the marine and coastal national parks of Venezuela. She has been living in South America since 1985, working as a consultant on protected area management for several national and international organizations, including The World Conservation Union (IUCN) and the German Technical Cooperation (GTZ), and is a professor at the San Francisco University of Quito, Ecuador. Address: Parques Nacionales y Conservación Ambiental, Casilla 17-21-1085, Quito, Ecuador. Tel. and Fax: ++593-2-895.810.

Araya, Pedro. Chilean forestry engineer. He works in matters relating to protected wilderness areas since 1976, when he began his professional career as a national park administrator. Since 1981, he is the head of the National Parks section of the National Forestry Corporation (CONAF), and has published several works, received training at international events, and provided technical assistance in other Latin American countries. Address: CONAF (Corporación Nacional Forestal), Gerencia Técnica, Depto. Patrimonio Silvestre, Avenida Bulnes 259, Oficina 604, Santiago, Chile. Tel: ++562-699.1257, Fax: 671.2007, 671.5881.

Baal, Ferdinand. Surinamese tropical silviculture engineer, graduate of the Agricultural University of Wageningen, Holland. He began his career in the Suriname Forestry Service in
Baudoin, Mario. Bolivian biologist, with a Ph.D. in Zoology from the University of Michigan. He was professor at the Universidad Nacional in Heredia, Costa Rica, where he chaired the College of Environmental Sciences, and at the Universidad Mayor de San Andrés in La Paz, where he chaired the Institute for Ecology. He has also been President of LIDEMA, the Bolivian federation of conservation NGOs. He was appointed the first National Director of Biological Conservation in Bolivia and at present is the Coordinator for the Graduate Program in Ecology and Conservation in La Paz. Address: Casilla 3079, La Paz, Bolivia. Tel: ++591-2-361,647.

Brant Rocha, Sérgio. Brazilian agricultural engineer. He has worked for many years with the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) in Brasilia, and currently is in charge of the Conservation Unit Creation and Implementation Division. Address: SQN 215, Bloco G, Apdo. 509, 70.874-070 Brasilia DF, Brazil. Tel: +55-61-321.2324, Fax: 273.5442, 322.1004.

Carrasco V., Alfredo. Ecuadorian geologist specialized in volcanology and seismology, graduate of the National Polytechnic School, Quito. He is general secretary of the Charles Darwin Foundation for the Galapagos Islands and was a member of the Multisectoral Commission that prepared the General tourist management and ecological conservation plan for the Galapagos Islands in 1991. Address: FChD (Fundación Charles Darwin para las Islas Galápagos), Av. 6 de Diciembre 4757 y Pasaje Califomia, Casilla 17-01-3891, Quito, Ecuador. Tel: ++593-2-244.803, Fax: 443.935.

Castaño Uribe, Carlos. Colombian anthropologist, with post-graduate studies in archaeology and a doctorate in American anthropology at the Complutense University of Madrid. He has been a professor in these subjects at the University of the Andes and the National University of Colombia. For several years he was director of Colombian National Parks, and, since 1989, he is the regional coordinator of the FAO Latin American Network of National Parks and Other Protected Areas, Flora and Wildlife, as well as coordinator of the FAO-TCA Amazon Basin Subregional Protected Areas Network and the Protected Areas Planning and Management Program of the TCA Special Environment Commission. Address: INDERENA (Instituto Nacional de los Recursos Naturales Renovables y del Ambiente), Subgerente de Bosques, Agua y Suelos, Apartado AÉreo 13455, Bogotá, Colombia. Fax: ++571.2-285 9987.

Castro Gutiérrez, Juan Manuel. Peruvian economist and head of the planning team for the Huascaran National Park master plan. Formerly director of Agrarian Economy and Cooperation of the Ancash and the Departmental Agrarian Unit of the Peruvian Ministry of Agrarian...
he has coordinated several national and international environmental conservation and planning projects, and is currently a professor at the Ancash National University. Address: c/o FPCN (Fundación Peruana para la Conservación de la Naturaleza), Calle Gnr. Recavarren 446, Apartado 18-1393, Lima 18, Peru. Tel: 51-1-446.3801, Fax: 446.9178.

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