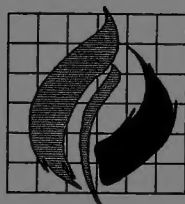


PART I SUBREGIONAL REVIEWS

**Tropical Latin America
(Sections 11 - 13)**

**ASSESSING THE CONSERVATION STATUS
OF THE WORLD'S TROPICAL FOREST**

A contribution to the FAO Forest
Resources Assessment 1990



Compiled by

WORLD CONSERVATION MONITORING CENTRE

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1 INTRODUCTION AND METHODS

MANAGING INFORMATION ON THE WORLD'S BIOLOGICAL DIVERSITY AT WCMC

The Earth's biological and other natural resources provide many economic, social and aesthetic benefits to mankind. This is particularly true of tropical forests which support over half the world's biological diversity, as well as provide much needed foreign exchange, and contribute to the livelihood of rural human populations in many developing countries. It is essential, therefore, that effective programmes for sustainable human development are based on conservation objectives. Responsible institutions and individuals need access to a service that provides factual information on the conservation status of the world's biological resources in a timely, focused and professional way.

This service is provided by the **World Conservation Monitoring Centre**, Cambridge, UK. Established in 1988 as a company limited by guarantee with charitable status, WCMC is managed as a joint-venture between the three partners in the *World Conservation Strategy* and its successor *Caring for the Earth*: IUCN - The World Conservation Union, UNEP - United Nations Environment Programme, and WWF - World Wide Fund for Nature. Its mission is to provide information on the status, security, management and utilisation of the world's biological diversity to support conservation and sustainable development.

To implement its mission, WCMC maintains substantial databases on the status and distribution of plant and animal species of conservation and development interest; habitats of conservation concern, particularly tropical forests, coral reefs and wetlands; the global network of conservation areas; and the international trade in wildlife species and their derivative products. Much of this information is managed using Geographic Information Systems, and is supported by an extensive bibliography of published and 'grey' literature. WCMC is also involved in providing support for the expansion of national data management capabilities in developing countries, and in developing communication networks for the flow of information.

WCMC contributes its data to GEMS - the Global Environment Monitoring System, coordinated by UNEP. GEMS is a collective programme of the world community to acquire, through global monitoring and assessment, the data that are needed for the rational management of the environment. GEMS is an element of the United Nations Earthwatch Programme.

Working closely with the IUCN Commission on National Parks and Protected areas since its inception in 1981, the WCMC Protected Areas Data Unit has compiled an extensive database of the world's conservation areas currently in excess of 30,000 records. Each record includes information on size, date of establishment, national designation, geographical coordinates, biogeographic province and, in the case of forest reserves, function. Boundaries of many of these conservation areas have been digitised from maps using a Geographic Information System, enabling them to be plotted and overlaid onto other georeferenced datasets for analytical and presentation purposes. In cases where maps of conservation areas are not available for digitising, the geographical coordinates can be used to plot their locations. This database, and associated digital files, has been expanded under the *WCMC Tropical Managed Areas Assessment 1990* and forms the basis to the present report.

The *WCMC Tropical Managed Areas Assessment 1990* is the first attempt to assess the contribution of the forestry sector to nature conservation. This assessment is therefore in many respects prototypical and in time could be significantly improved. This will require major improvements in the management of information on forestry sector data relating to protection and conservation, at the national level, and thus subsequently at the sub-regional, regional and global levels. In many instances this assessment has had to be carried out at two levels, based either on information that is derived from the site-specific level, or information that is only available at the aggregated system level. In the latter case, therefore, it is not possible to provide information on mean size and size distribution, location information, overlap with wildlife sector conservation areas, or precise numbers and areas of sites assigned to production, protection or conservation uses.

Future assessments could be made more comprehensive and more reliable if this detailed, site-specific information becomes available for both wildlife and forestry sectors.

HOW TO USE THIS REPORT

Findings from the WCMC Assessment are presented in this final report to the Overseas Development Administration, UK, which has funded the project. The report represents WCMC's contribution to the *FAO Forest Resources Assessment 1990*. It has been planned in close consultation with FAO so that its contents can be readily incorporated within or supplement the FAO Assessment. It comprises three parts as follows:

- Part I** subregional reviews of managed areas in tropical countries for Asia & Pacific, Africa, and Latin America;
- Part II** regional and global overview of managed areas for each of the three tropical regions (Asia & Pacific, Africa, and Latin America), based on the subregional reviews in Part I; and
- Part III** maps and lists of managed areas for each tropical country.

The report is intended to be a source of information and analysis rather than to be read from cover to cover. The primary means of accessing this information is through the Contents list. Before dipping into the main body of the report, the reader is urged to browse Section 1.2 on *Methods* which not only explains how the information has been collected and compiled, but also draws attention to its limitations.

The subregional reviews in Part I, which include summary statistics for individual countries, have been compiled according to a standard format to enable comparisons to be made directly between countries and subregions. Each subregional section is self-contained, complete with bibliography and annexes in which summary data on the forest estate are presented and conservation areas are listed. The exceptions are the country maps of managed and conservation areas which, because of their larger A3-size, are presented separately in Part III. The conservation areas listed in Annexes X.1 of the subregional sections are cross-referenced to the maps in Part III, enabling the location of individual sites to be identified from the maps. Sources of maps with annotations are provided in Section 1 of Part III. Part II comprises regional and global reviews based on summary details extracted from each subregional section in Part I.

A number of terms have been used which have very specific meanings so far as this report is concerned. Examples include forest land, managed area, conservation area, forestry sector, wildlife sector and total area. These and others are defined in the Glossary at the end of Section 1.

Finally, this report is largely a review and analysis of information contained in the four-volume series *Protected areas of the world: a review of national systems* prepared by WCMC and published by IUCN for the IV World Parks Congress, Caracas, 10-21 February 1992 (IUCN, 1992). Referencing of the text in this report has been kept to a minimum, thereby avoiding repetition of the extensive bibliographies contained in the four-volume series. These should be consulted for much of the background information on national conservation area networks, with details of their legislative and administrative basis, and of their representativeness.

ACKNOWLEDGEMENTS

Production of this report has been based largely on the substantial conservation areas database and associated digital maps that WCMC manages, supplemented by a massive pantropical data gathering exercise. This information is drawn from an extensive network of conservation area professionals within forestry and wildlife authorities, as well as those within scientific institutions and conservation bodies. WCMC wishes to express its thanks to these individuals and their agencies, too numerous to mention individually, for their support without which it would be unable to operate. WCMC recognises with particular gratitude the fundamental contribution of the IUCN Commission on National Parks and Protected Areas, whose commitment to WCMC over the years has helped the Centre to develop its capability in managing information on the world's conservation areas. WCMC also acknowledges the support of the IUCN Forest Conservation Programme, which was instrumental in initiating this project, and the IUCN Environmental Law Centre for its help with information on conservation areas legislation.

Staff at WCMC involved in the *Tropical Managed Areas Assessment 1990* include Mike Adam, Clare Billington, Simon Blythe, Gillian Bunting, Daphne Clark, Graham Drucker, Harriet Gillett, Donald Gordon, Michael Green, Thomas Moriarty, James Paine, Corinna Ravilious, Deborah Rothera, Joel Smith, Mark Spalding and Alison Suter. The project has been managed by Jeremy Harrison and coordinated by Michael Green with assistance from Clare Billington and James Paine.

The *WCMC Tropical Managed Areas Assessment 1990* has been funded entirely by the Overseas Development Administration of the UK under Research Scheme No. 4544. Particular thanks are due to staff within the Natural Resources and Environment Department who have supported this initiative through its various stages.

WCMC has welcomed the opportunity to integrate this project with the *FAO Forest Resources Assessment 1990*. The support of Dr K D Singh, its coordinator, and his colleagues is greatly appreciated.

1 INTRODUCTION AND METHODS

1.1 INTRODUCING THE WCMC TROPICAL MANAGED AREAS ASSESSMENT

1.1.1 Background

The clearance of tropical forests, both rain forests and dry forests is an issue at the top of the environmental agenda. Most tropical forest occurs within developing nations where pressures are greatest from burgeoning populations to exploit this resource for its products and convert forest land to agriculture. Meanwhile, developed nations are concerned that such forests contain half the world's species, as well as playing an important role in maintaining global climatic stability.

In order to assess the status of tropical forests (and woodlands) and identify trends in deforestation and afforestation, FAO and UNEP conducted a survey of tropical forest resources in 76 tropical countries in 1978-1981 (FAO, 1981). It was concluded from the *Tropical Forest Resources Assessment 1980* that human population growth and agricultural expansion are the main causes of deforestation in the tropics. The 1980 Assessment was instrumental in mobilising global support for the *Tropical Forestry Action Plan* which aims to stem, and eventually reverse, the process of deforestation and forest degradation in the tropics.

Much of this deforestation and degradation is unmanaged, uncontrolled and unsustainable, providing no long-term benefits to the local people involved. An integrated approach to land-use is needed whereby: forests are converted to agriculture only where soils are rich; they are managed for minor forest products for the benefit of local people as well as for timber production; and they are selectively protected in order to maintain ecological services, genetic resources and biological diversity. Such protection forests are a vital resource for local people, and are being managed increasingly for the direct benefit of local communities on whom ultimately depends the future integrity and maintenance of conservation area systems.

1.1.2 FAO Forest Resources Assessment 1990

Aware of the need to improve and update the baseline information gathered under the 1980 Assessment in order to keep governments and the international community informed of the state of tropical forest resources, FAO is carrying out an assessment for 1990 (FAO, 1990). The *FAO Forest Resources Assessment 1990* complements the new round of assessments of forest resources in temperate countries conducted under the auspices of the FAO/ECE Timber Committee in Geneva for the reference year 1990. It was also intended that the scope of the 1990 Assessment would be expanded to include non-tropical developing countries, where trends in deforestation and degradation are linked with processes of desertification as well as with pressure from agriculture and inadequate management. However, this part of the 1990 Assessment has not yet been funded.

It was generally recognised that the 1980 Assessment was over-concerned with commodity production, notably timber, and that more emphasis should be given to the service functions of forest, including environmental protection and nature conservation. This is being addressed by the *WCMC Tropical Managed Areas Assessment 1990* which is designed to quantify the environmental services of tropical forests (particularly with respect to conservation areas) and form an integral part of the *FAO Forest Resources Assessment 1990*. Efficient integrated land-use is essential to ensuring that local people benefit from available forest resources. Hence the importance of the WCMC Assessment in helping to ensure that conservation areas are considered by resource-use planners to be efficient forms of land-use.

1.1.3 WCMC Tropical Managed Areas Assessment 1990

Tropical forests have long been valued for their timber, on account of which governments of many countries have either nationalised them or developed extensive networks of forest reserves to safeguard them from over-exploitation and conversion to other forms of use. Such provisions have often proved inadequate due to a lack of proper management practices and enforcement measures in the face of ever mounting pressures on forests for their timber and potential agricultural land. While attention within the forestry sector has been focused primarily on their timber production value, with exploitation all too frequently occurring at unsustainable levels, there has been a growing awareness of the ecological values of tropical forests as centres of biological diversity

and endemism, and for watershed management. Increasingly, countries in Latin America, Africa and Asia have been allocating forest reserves or parts thereof to protect watersheds and conserve biological resources. But quite how much tropical forest is reserved for such protection and conservation purposes within the forestry sector is not known.

The *WCMC Tropical Managed Areas Assessment 1990* is a three-year project (July 1989-June 1992) funded by the Overseas Development Administration, UK under Research Scheme No. R4544. It is being carried out in collaboration with IUCN - The World Conservation Union, in particular its Forest Conservation Programme and Commission on National Parks and Protected Areas, and in cooperation with the Food and Agricultural Organization of the United Nations to compliment its *Forest Resources Assessment 1990*.

Its overall objective is to complement the *FAO Forest Resources Assessment 1990* by quantifying the contribution of forestry, wildlife and other sectors to nature conservation in the tropics. This will help to identify gaps in existing managed and conservation area networks and, particularly with respect to the forestry sector, highlight the need for increased allocation of tropical forests for protection and conservation purposes.

Under the terms of the ODA Memorandum, the specific objectives of the *WCMC Tropical Managed Areas Assessment 1990* with respect to "each of the countries covered by the [FAO] Tropical Forest Resources Assessment Project" are as follows:

- to update information held by WCMC on conservation area systems, and to expand its information on managed areas other than those established primarily for nature conservation, particularly with respect to forest reserves managed for sustainable resource use;
- to present this information in short accounts of the state of national managed and conservation area systems, drawing the main conclusions into regional summaries;
- to map managed and conservation area systems on a Geographic Information System;
- to use this GIS facility to analyse the coverage of different vegetation types or bioclimatic units by managed and conservation areas, and to examine the coverage afforded to different regions by those systems;
- to prepare analyses of managed area coverage by forest type and management category, and present this in a form that is compatible with the *FAO Forest Resources Assessment 1990* tables and reports; and
- to prepare further analyses and reports as time permits.

These objectives have been met, with the exception of the analysis of vegetation/bioclimatic types, and findings are presented in this report and in the four-volume series *Protected Areas of the World: A Review of National Systems* (IUCN, 1992), compiled by WCMC. The latter country-by-country review of the world's conservation areas was produced for the IV World Parks Congress, Caracas, 10-21 February 1992 under a separate but related project funded by British Petroleum. It comprises descriptions, lists and maps of national conservation area networks. A considerable amount of information on national conservation area networks generated from the WCMC Assessment has been incorporated within this series, which provides the basis of the present report.

It has not been possible to examine coverage of the different vegetation/bioclimatic types by managed and conservation areas within the available time. It has been WCMC's intention throughout the project to base this analysis on the ecofloristic zone maps of the tropics produced for FAO by the Institut de la Carte Internationale de la Végétation, Université Paul Sabatier, Toulouse. Such maps have been available for tropical Asia (Sharma, 1986a) and Africa (Sharma, 1986b) for some time, but those for parts of Latin America have still to be completed. WCMC did not acquire the digital datasets of ecofloristic zones for Asia, Africa and Latin America (excluding Central America and Mexico) from FAO until the penultimate month of the project. Subsequent technical problems with the geo-referencing of the digital ecofloristic zone data sets precluded an analysis based on protected areas data sets.

It is still planned to assess the representativeness of the managed and conservation area networks with respect to ecofloristic zones, but in the months immediately following completion of this report. This study will be carried out in close cooperation with FAO and the results presented in a separate report.

1.1.4 Status of the FAO Assessment and its implications on the WCMC Assessment

The FAO Assessment has changed in several respects from those originally specified in the *Guidelines for Assessment* (FAO, 1990), due to inadequate information and a lack of additional funding. Changes which have directly affected the scope of the WCMC Assessment are as follows:

- it will cover only tropical countries, with the exception of those in Insular Africa (other than Madagascar) and Oceania which have been dropped due to paucity of data. Thus, the FAO Assessment currently covers only 100 out of the 130 tropical countries originally identified for inclusion. These are listed in Annex 1.1;
- it is not being extended to an additional 30 non-tropical developing countries as originally anticipated because of a lack of further funding; and
- it is no longer planned to produce a series of country briefs due to the lack of a comprehensive response from tropical countries.

In view of these constraints and developments, the WCMC Assessment has necessarily been modified in order to maintain its consistency with the FAO Assessment. It includes 100 of the 101 geopolitical units covered by the FAO Assessment (Saint Pierre and Miquelon, listed by FAO under the Caribbean subregion is excluded from the WCMC Assessment), *plus* those five countries in Oceania which have a significant amount of forest (i.e. Fiji, Papua New Guinea, New Caledonia, Solomon Islands and Vanuatu), and Bermuda as listed in Annex 1.1.

The FAO Assessment will officially end in October 1992 with the completion of a series of regional reports covering Asia, Africa and Latin America. It is anticipated that this report will supplement the FAO regional reports, or be incorporated within them. A preliminary, summary version of Part II of this report has already been presented to FAO for inclusion within its report to the United Nations Conference on the Environment and Development (FAO, 1992).

1.2 METHODS

1.2.1 Scope

The *WCMC Tropical Managed Areas Assessment 1990* covers 106 tropical geopolitical units. These are split into 12 subregions and three tropical regions (Latin America, Africa and Asia & Pacific), as shown in Annex 1.1.

The scope of the WCMC Assessment was initially wider, covering a total of 163 geopolitical units in line with the *FAO Forest Resources Assessment 1990*. It included all those in Insular Africa and Oceanian subregions and extended to non-tropical developing countries. Government agencies within 158 of these geopolitical units were approached for information during the early stages of the project. But it was subsequently trimmed in line with changes within the FAO Assessment, as explained above (Section 1.1.4).

The study is focused on *managed areas*, particularly those having a protection or conservation role which are referred to as *conservation areas* in this report. These terms are defined in the Glossary. It is directed primarily at the forestry and wildlife sectors, within which occur the majority of managed areas. Additional sectors are covered where appropriate.

No attempt has been made to exclude managed areas notified after 1990 from the WCMC Assessment because this would not affect the analysis significantly. The number of records of sites established post-1990 is only 119, which is less than 0.5% of all the sites recorded on the WCMC database as having been established prior to 1990.

1.2.2 Data collection

Forestry sector Prior to this assessment, WCMC's information on managed areas in the forestry sector had been patchy, with good coverage of a few countries and scant or no data for the majority. Managed areas in the forestry sector are used predominantly for production purposes and, therefore, are of secondary interest to WCMC, as compared to those areas under protection and conservation management regimes.

For the purpose of this study, it was necessary for WCMC to contact forest administrations in every tropical country, often for the first time. Administrations were asked for statistics and maps of the forest estate, information relating to its management and copies of relevant legislation. A standard letter was drafted in consultation with colleagues in the IUCN Forest Conservation Programme and the FAO Assessment, translated into French and Spanish, and circulated to all forest administrations using the list of *Heads of National Forestry, Wildlife and Parks Administrations* maintained by the FAO. Attached to the letter were two tables which these authorities were requested to fill in. The English version of the standard letter and tables is shown in Annex 1.2.

Letters to forest administrations in 158 tropical and non-tropical developing countries (or geopolitical units) were sent out during the second quarter of 1990. Responses were received initially from 20% of countries, but, following reminder letters being sent in December, the response rate had increased to 40% by April 1991. As previously mentioned (Section 1.1.4), the scope of the project was reduced to 100 tropical countries following changes made to the FAO Assessment in mid-1991, and WCMC's efforts in the latter part of 1991 and early 1992 concentrated on soliciting responses outstanding from among these tropical countries. By the end of this project, 52% of tropical countries had responded (Table 1.1). The level of response was remarkably even, ranging from 48% in Tropical Latin America to 56% in Tropical Africa. A number of reasons may account for this relatively disappointing level of response. First, many of the countries in this assessment have extremely meagre financial resources dedicated to forestry and wildlife activities, and staff may not have been available to compile the information requested. Secondly, as a related issue, it is likely that the detailed information on individual sites, maps etc. may not be available, even within the countries themselves. This indicates the importance of supporting and building information gathering and management capacity within countries.

Information obtained directly from forest administrations was supplemented with data gathered under the FAO Assessment, particularly in the case of those which did not respond to WCMC's requests. In the absence of any recent data, and as a last resort, statistics were used from the *Tropical Forest Resources Assessment 1980* (FAO, 1981) with respect to quantifying the extent of natural forest under production. Additional information on the forestry sector was obtained from the libraries of the FAO Forest Department, Rome and the Oxford Forestry Institute. Copies of much of the forest legislation relevant to managed areas were obtained from the FAO Forest Resources Division.

Wildlife sector WCMC already holds an extensive body of information on conservation areas within the wildlife sector. This information has been gathered over many years as a result of direct contact with the appropriate government and other agencies responsible for their management. It is continuously being updated as existing areas are upgraded in their conservation status or enlarged, and as new ones are created.

Relevant agencies within all tropical countries were contacted at some stage during the WCMC Assessment for their latest lists and maps of conservation areas, or asked to check and update such material generated from the WCMC Protected Areas Database and Biodiversity Map Library. Much of this information-gathering exercise was conducted under the auspices of compiling *Protected areas of a world: a review of national systems* (IUCN, 1992), with relevant data feeding directly into the WCMC Assessment. As explained in Section 1.1.3, these two projects complement each other.

Table 1.1 Level of response from forest administrations in tropical countries to requests for information on managed areas initially made in March-June 1990. At least two reminders were sent over the subsequent two years to those administrations which did not respond.

REGION	No. countries	No. countries responding	Response level
TROPICAL ASIA & PACIFIC			
South Asia	7	3	43 %
Continental South East Asia	5	2	40 %
Insular South East Asia	5	4	80 %
Oceania	5	2	40 %
Subtotal	22	11	50 %
TROPICAL AFRICA			
West Sahelian Africa	9	3	33 %
East Sahelian Africa	6	4	67 %
West Africa	8	6	75 %
Central Africa	7	2	28 %
Tropical Southern Africa (+ Madagascar)	11	8	73 %
Subtotal	41	23	56 %
TROPICAL LATIN AMERICA			
Central America (+ Mexico)	8	3	38 %
Caribbean	25	14	56 %
South America	10	21	40 %
Subtotal	43	21	48 %
TOTAL	106	55	52 %

Maps Where possible, maps of managed areas were obtained from the relevant government authorities within the forestry, wildlife and any other sectors in order to digitise their boundaries using a Geographic Information System. In addition, the map libraries of the University of Cambridge and Oxford Forestry Institute were searched for maps of managed areas. Maps were also obtained from the Natural Resources Institute of the Overseas Development Administration (ODNRI) and Hunting Technical Services, UK.

1.2.3 Data management

WCMC manages its information on conservation areas in the following ways:

- hard copies of bibliographic material (books, papers, reports, legislation etc), correspondence with raw data, and maps are filed on a geographic basis;
- relevant data are extracted from this raw material and stored electronically in the WCMC Protected Areas Database or, in the case of maps, digitised using a Geographic Information System and stored within the WCMC Biodiversity Map Library; and
- texts describing national conservation area networks, their legal and administrative basis, are compiled using a standard format and stored electronically. (Texts describing individual conservation areas are also compiled, and stored in the same way, but these are not relevant to this study.)

For purposes of the WCMC Assessment, the WCMC Protected Areas Database was expanded to include other managed areas, notably forest reserves. A number of modifications were made to the database to enable the function of forest reserves to be recorded as production, protection or conservation, in line with the classification used by FAO (1990). This database currently comprises some 31,000 records, of which some 9,136 are relevant to the WCMC Assessment.. An example of the type of output which can be generated from the Protected Areas Database are the lists of conservation areas presented in Annex X.2 of respective subregional chapters within Part I of this report.

Summary statistics of the forest estate provided by respective forest administrations in Table 1 of Annex 1.2 at the request of WCMC were entered into a series of worksheets within a Lotus 1-2-3 spreadsheet. Output from this database appears as Annex X.1 of respective subregional chapters.

Maps of managed areas were digitised using mainly ARC/INFO but also ATLAS*GIS software, in the latter stages of the project. Digital files are stored within the WCMC Biodiversity Map Library.

1.2.4 Analysis and review of information

This is described below for each part of the report. Limitations with the data are discussed in *italics* as appropriate.

PART I

The way in which data are generated, analysed and presented is described below for each section of the subregional chapters.

X.1 Historical Perspective Reviews the way in which nature conservation has evolved through legal and administrative regimes, based on information contained in *Protected areas of the world: a review of national systems* (IUCN, 1992).

X.2 Nature Conservation Policy and Legislation Reviews current nature conservation policy and legislation within forestry, wildlife and other sectors, based on information contained in *Protected areas of the world: a review of national systems* (IUCN, 1992). Table X.1 has been compiled by extracting the relevant data from the Annex of legal designations in IUCN (1992). The sector to which individual pieces of legislation apply (i.e. forestry, wildlife or additional) is indicated, together with management objectives for each designation as legislated or laid down in policies.

X.3 Managed Areas Administration Reviews current administration within forest, wildlife and other additional sectors based on information in *Protected areas of the world: a review of national systems* (IUCN, 1992).

X.4 Managed Areas Status Data on managed areas originates from two databases, namely the WCMC Protected Areas Database (Annex X.1), and the Lotus 1-2-3 spreadsheet with the responses from forest administrations (Annex X.2).

Data in Table X.2, showing the extent of natural forest land under production, protection and conservation, are derived directly from Annex X.2. It should be noted that, whereas statistics for individual protection and conservation forests were collected as part of the WCMC Assessment, this was not extended to production forests. *Data presented in Annex X.2 are often subject to a number of limitations, due to the way in which statistics are compiled nationally, as follows:*

- *It is not always possible to distinguish between the different forest origins. For example, data for natural forest may occasionally include plantation forest.*
- *It is frequently difficult to differentiate between protection and conservation forest as countries do not necessarily follow the classification system drawn up by FAO (1990). In the final analysis, this does not affect the WCMC Assessment as both protection and conservation forest are treated similarly as conservation areas.*
- *It is not always known whether or not raw data for protection and conservation forest, as supplied by forest administrations, include conservation areas managed by the wildlife sector. Where this is known to be the case, the raw data have been modified by subtracting the contribution of the wildlife sector.*

These and other deficiencies reflect the availability of national statistics, or the way in which they are compiled, and are noted at the foot of the tables in Annex X.2.

Coverage The WCMC Protected Areas Database was used to generate statistics for analysing the coverage of national conservation area networks in terms of total and partial protection, and assessing the relative contribution of the forestry, wildlife and additional sectors. These statistics are presented in Table X.3. The analysis extends to all existing and proposed conservation areas, irrespective of their size, but managed areas under productive regimes are excluded. It does not extend to privately-owned and managed reserves. Coverage by national conservation area networks is expressed as a percentage of the total area of a country, and examined in relation to the widely-accepted target of 10%. This is considered to be a realistic goal for many countries, taking into account other demands on land for economic development and subsistence needs. Coverage expressed as a percentage of total area can be misleading, however, in the case of the countries with widely scattered islands and having a marine component that is well represented within the conservation area network. This discrepancy arises because total area accounts for land and inland water bodies only, and not territorial waters.

The representativeness of conservation area networks is examined with respect to major habitats, and gaps identified from other studies are highlighted. Particular attention is given to whether or not plans based on systematic surveys have been formulated to ensure that the full range of a country's biological diversity is represented within its conservation area network.

Integrity Mean size and the frequency distribution of conservation area sizes are used as a measure of the integrity of conservation area networks (Table X.4). This, by necessity, is based only on data where the extent of individual conservation areas is known. Thus, aggregated data that may be included in Table X.2, Table X.3 or Annex X.2 will not appear. Given that, in effect, conservation areas have been increasingly established as islands in a sea of humanity, they should be theoretically as large as possible to maximise the degree to which their contents retain their integrity (Soulé, 1983). Thus, the effectiveness of a conservation areas network in maintaining biological diversity will partly be a function of the size of its constituent units. For example, conservation areas need to be large enough to support minimum viable populations of key species. These should consist of at least 500 genetically effective individuals, or a total population of about 1,000 individuals including juveniles and other non-breeders (Soulé, 1986). The optimal size of a conservation area will vary with respect to the key species under protection, but the many sites that contain populations of threatened large mammals need to extend over several tens or hundreds of thousands of hectares, respectively, for ungulates or carnivores at the top of their food chains.

The effectiveness with which conservation areas are managed is assessed qualitatively, based largely upon information from *Protected areas of the world: a review of national systems* (IUCN, 1992).

X.5 Future Prospects Official proposals to expand conservation area networks are reviewed, based on statistics presented in Table X.3. The many new conservation areas recommended by authorities other than the responsible management agencies, such as consultants representing non-governmental organisations and aid agencies, are excluded from the analysis. Other national initiatives to strengthen networks through specific projects and programmes, to overcome economic constraints through funding mechanisms, and to improve management through new approaches are reviewed. Participation in international and regional conventions and programmes, particularly with respect to the Convention concerning the World Cultural and Natural Heritage (World Heritage Convention), the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and the Unesco Man and the Biosphere Programme is reviewed (Table X.5), together with attempts between adjacent countries to manage conservation areas under cooperative agreements.

X.6 Priorities for Action These are necessarily broad and may not be comprehensive, but the priorities identified in this report are summarised in Table X.6.

PART II

The analyses in Part II are essentially similar to those described above for Part I, but carried out at the regional and global level, rather than subregional level. This is intended to summarise the major trends across each of the three continental regions, and at a global level. It is by necessity a summary document dealing with generalisations, and should be read in conjunction with appropriate sub-regional reports, where much greater detail and elaboration is provided.

PART III

This part of the report consists entirely of maps of managed areas of each country generated from the WCMC Biodiversity Map Library. Maps show the boundaries of existing managed areas, where known, or their centre points if only their geographic coordinates are known. Proposed managed areas are not mapped. Different hatching patterns are used to distinguish between the following:

- managed areas under production and conservation areas within the forestry sector.
- conservation areas within the forestry sector and those within the wildlife and any other additional sectors.

Conservation areas are numbered on the maps; these numbers correspond to the numbers in the respective lists for each country in Annex X.2 of the subregional reports. Not all conservation areas are mapped because the

locations of some sites are not known. This is evident by comparing the numbers in Annex X.2 with those in the maps.

Managed areas under production are mapped, if the information is available, but they are not individually named by cross-referencing to the list in Annex X.2 as in the case of conservation areas.

The source material from which the maps are derived is given at the beginning of Part III on a country-by-country basis.

Maps are based on the best available information. Sometimes this may be ten or more years old, as in the case of Atlas of Forest Resources of India published by the Government of India in 1976. This was used as the source for digitising India's forest reserves. In this particular case, there has been relatively little change (4%) in the total area of reserved forests, from 39.8 million ha in 1976 (Government of India, 1984) to 41.5 million ha in 1991 (Forest Survey of India, 1992), and boundaries of many forest reserves may not have changed significantly. Sometimes it has been possible to obtain copies of digital files, for example, most South American countries. In the case of Indonesia, a full set of film positives of Map 9 Land Cover and Suggested Forest Zoning, The Land Resources of Indonesia - A National Overview - Atlas was obtained from the Natural Resources Institute of the Overseas Development Administration, but unfortunately these could not be digitised for technical reasons. Sources used in the production of maps are given at the beginning of Part III.

REFERENCES

- FAO (1981). *Forest resources of Tropical Africa, Tropical America and Tropical Asia: regional synthesis and country briefs*. 4 volumes. FAO/UNEP Tropical Forest Resources Assessment Project, Rome.
- FAO (1990). *Guidelines for assessment*. July 1990. Forest Resources Assessment 1990. FAO, Rome.
- FAO (1992). *The forest resources of the tropical zone by main ecological regions. Forest Resources Assessment 1990 Project*. Report presented at the United Nations Conference on the Environment and Development, Rio de Janeiro, June 1992.
- Forest Survey of India (1992). *The state of forest report 1991*. Forest Survey of India, Dehra Dun. 89 pp.
- Government of India (1984). *India's forests 1984*. Forest Research Institute, Dehra Dun. 114 pp.
- IUCN (1992). *Protected areas of the world: a review of national systems*. 4 volumes. Prepared by the World Conservation Monitoring Centre. IUCN, Gland, Switzerland and Cambridge, UK.
- Sharma, M.K. (1986a). *Eco-floristic zone and vegetation maps of tropical continental Asia*. Institut de la Carte Internationale de la Végétation, Université Paul Sabatier, Toulouse, France.
- Sharma, M.K. (1986b). *Eco-floristic zones of Africa*. Institut de la Carte Internationale de la Végétation, Université Paul Sabatier, Toulouse, France.
- Soulé, M.E. (1983). *Applications of genetics and population biology: the what, where and how of nature reserves*. In: *Conservation, Science and Society*. Unesco-UNEP. Pp. 252-264.
- Soulé, M.E. (Ed.) (1986). *Viable populations for conservation*. Cambridge University Press, Cambridge, UK. P. 189.

Annex 1.1 **List of countries included within the WCMC Tropical Managed Areas Assessment 1990**

AFRICA (TROPICAL)

West Sahelian Africa

Burkina
Cape Verde
Chad
Gambia
Guinea-Bissau
Mali
Mauritania
Niger
Senegal

East Sahelian Africa

Djibouti
Ethiopia
Kenya
Somalia
Sudan
Uganda

West Africa

Benin
Côte d'Ivoire
Ghana
Guinea
Liberia
Nigeria
Sierra Leone
Togo

Central Africa

Cameroon
Central African Republic
Congo
Equatorial Guinea
Gabon
Sao Tome & Principe
Zaire

Tropical Southern Africa

Angola
Botswana
Burundi
Malawi
Mozambique
Namibia
Rwanda
Tanzania
Zambia
Zimbabwe

Insular Africa

Madagascar

LATIN AMERICA (TROPICAL)

Central America and Mexico

Belize
Costa Rica
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama

Caribbean

Anguilla
Antigua and Barbuda
Aruba
Bahamas
Barbados
Bermuda
British Virgin Islands
Cayman Islands
Cuba
Dominica
Dominican Republic
Grenada

Guadeloupe

Haiti
Jamaica
Martinique
Montserrat
Netherlands Antilles
Puerto Rico
Saint Lucia
Saint Vincent & the
Grenadines
Saint Christopher &
Nevis
Trinidad & Tobago
Turks & Caicos Islands
US Virgin Islands

Tropical South America

Bolivia
Brazil
Colombia
Ecuador
French Guiana
Guyana
Paraguay
Peru
Suriname
Venezuela

ASIA & PACIFIC (TROPICAL)

South Asia

Bangladesh
Bhutan
India
Maldives
Nepal
Pakistan
Sri Lanka

Continental South East Asia

Cambodia
Lao PDR

Myanmar

Thailand
Viet Nam

Insular South East Asia

Brunei Darussalam
Indonesia
Malaysia
Philippines
Singapore

Oceania

Fiji*
New Caledonia*
Papua New Guinea*
Solomon Islands*
Vanuatu*

*Excluded from *FAO Forest Resources Assessment 1990*.

Annex 1.2 Letter to heads of all forest administrations in developing countries

Dear

FAO Forest Resources Assessment 1990

The World Conservation Monitoring Centre, in cooperation with the IUCN Tropical Forest Programme, is currently gathering information on protected and managed forests in tropical/developing countries for incorporation into the Forest Resources Assessment 1990 being implemented by FAO under the framework of the Tropical Forestry Action Plan.

The last such survey undertaken by FAO was in 1980, in response to concern about the depletion and degradation of tropical forests and woodlands throughout the world. That assessment covered 76 tropical countries and provided a set of quantitative estimates on forest resources and deforestation rates. The findings were instrumental in mobilising global support for the Tropical Forestry Action Plan, the aim of which is to reverse the process of deforestation and forest degradation in the tropics.

As you are aware, FAO is carrying out a further assessment, working to a baseline of 1990. In the new assessment explicit emphasis will be given to reviewing the service functions of forests, **including environmental protection and nature conservation**. It is necessary, therefore, to examine the extent to which tropical forests and woodlands have been assigned a conservation role through their protection as national parks, wildlife sanctuaries and the like, or as certain categories of forest reserve. WCMC is working closely with FAO in preparing this part of the Assessment, with the support of the Overseas Development Administration of the UK.

Information is needed on the forest reserve system within your country. It would be very much appreciated if the following details could be provided by the end of May 1990:

1. statistical data summarising the extent of the forest reserve network as shown in Table 1.
2. a map (Scale 1:1 million is preferred, complete with projection - e.g. Mercator - and latitude and longitude registration marks) showing the distribution of the forest reserve network, with all forests reserved for protection or conservation purposes (e.g. protection of watersheds and water catchments, nature conservation) named and their boundaries marked;
3. a register of protection and conservation forests to be cross-referenced to the above map (2), with details of size, date of notification etc. as shown in Table 2.

In addition, it would be helpful if you could also provide the following:

4. copies of forestry legislation and policy relevant to the general establishment of forest reserves (but copies of legislation dealing with the notification of individual reserves is not needed);
5. precise definitions of the different categories of forest reserves, if not covered by the above (4);
6. details of recently introduced or proposed conservation measures within the forestry sector (e.g. bans on logging above specified altitudes or gradients, total bans on logging or raw log exports); and
7. a copy of the forest department annual report. **It would be most helpful if WCMC could be put on your department's mailing list for future issues.**

Your help is greatly appreciated and if there is any way in which we might be able to reciprocate with information, please do not hesitate to contact us.

Yours sincerely

WCMC Tropical Managed Areas Assessment 1990

Table 1 National forest reserve network - summary information

Please complete the table below in the manner illustrated by the example, or supply an official listing annotated as appropriate with the information requested. Any policies relevant to the protection of forests should be entered as a footnote to the table as shown below.

For the purposes of the FAO Forest Resources Assessment 1990, forest function is classified according to the following definitions:

Production forests - areas which support sustained production of wood.

Protection forests - areas, other than conservation forests, which in practice cannot support sustained wood production because the terrain is unsuitable (eg too steep or rugged, subject to flooding).

Conservation forests - areas designated for conservation.

NAME OF COUNTRY/STATE: e.g. Gondwanaland

MONTH/YEAR OF REFERENCE:

e.g. December 1989

National designation - Class	Forest Function			No. reserves	Area (ha)
	Prod.	Prot.	Cons.		
Forest Reserves				126	3,783,417
- Protection Forests		+		28	999,777
- Commercial Forests ^{1/2}	+			38	2,674,576
- Amenity Forests			+	11	20,767
- Virgin Jungle Reserves			+	49	88,306

¹ No logging permitted above 2,000m: this amounts to an area of c.198,000 ha.

² No logging permitted in the coastal zone: this amounts to an area of c.143,000 ha

Table 2 Register of protection/conservation forests

Please complete the table below in the manner illustrated by the example, or supply an official listing annotated as appropriate with the information requested. Please ensure that all protection and conservation reserves listed in the table are cross-referenced with the map, but if this is not possible please include their geographic coordinates in the table.

NAME OF COUNTRY/STATE: e.g. Gondwanaland
MONTH/YEAR OF REFERENCE: e.g. December 1989

Nat. designation - Class - Name of site	Geog. coord.	Size (ha)	Date notified	Notification No.	Forest type ¹	Has logging ever occurred in the past? If so, give last date.
Forest Reserves						
- Protection Forests						
1. Baldan Hill	see map	52	14.3.84	Forests (Amendment) Enactment No. 4	F	Yes-last logged in 1952
2. Balembang	"	371	"	"	F	No
- Amenity Forests						
1. Babangat	"	31	"	"	N	No
2. Barada	"	22	"	"	P	Yes-last logged in 1978
- Virgin Jungle Reserves						
1. Basiara	"	213	"	"	F	No
2. Batutim	"	261	"	"	F	No

¹Forest types: F = natural forest / N = non forest / P = plantation forest

GLOSSARY

This highly selective glossary provides definitions of some of the less familiar or more technical terms used in this report.

Alienable forest land Forest land available for transfer to other forms of land use (FAO, 1990).

Conservation forest Areas within the forestry sector designated for conservation by law or other regulations (FAO, 1990).

Conservation area Defined as for protected area. [The term conservation area is used instead of protected area with which it is synonymous.]

Forest land An area of land proclaimed to be forest under a Forest Act or Ordinance (FAO, 1990).

Forest reserve Generally well-defined, surveyed, demarcated and legally constituted forest under the control of a forest department. All acts of felling, collection of forest produce, grazing and even trespassing are usually prohibited unless expressly permitted by law (FAO, 1981).

Forestry sector That part of government responsible for the protection and management of forest land.

Land area Refers to total area excluding the area under inland water bodies, these being major rivers and lakes. [Data are taken from the FAO Production Yearbook.]

Managed area A legally designated natural area managed for production on a sustainable basis or for conservation purposes. The term includes conservation area and is frequently used generically when referring to reserves within the forestry sector that may have a production and/or conservation function.

Natural forest Forest composed of tree species known to be indigenous to the area. Included in this definition are primary forest (undisturbed), disturbed primary forest associated with various intensities of selective logging, secondary forest resulting from logging of primary forest, logged over forest with under-planting of exotics, and managed forest regenerated artificially or naturally so long as this involves the renewal of essentially the same crop as before (FAO, 1990).

Notified forest Forest land that is notified as reserved. N.B notified forests are usually demarcated, the boundaries being given in the notification.

Plantation forest refers to forest established artificially by afforestation on lands which previously did not carry forest within living memory, or by reforestation of previously forested land involving the replacement of indigenous species by new and essentially different species or genetic varieties (FAO, 1990).

Production forest Forest having terrain and soil conditions suitable for the production of wood and other products on a sustainable basis. The distance to consumption or export centres is not taken into account, which means that economically inaccessible forests are included in this class (FAO, 1990).

Protected area An area of land and/or sea managed through legal or customary regimes so as to protect and maintain biological diversity and natural and associated cultural resources. [This definition was agreed at the IV World Parks Congress on National Parks and Protected areas, Caracas, 10-12 February 1992. The term protected area is not used in this report, conservation area being preferred.]

Protected forest Similar to forest reserve in so far as being notified, demarcated and under the control of a forest department. However, the degree of control exercised is generally of a low order and nearby villagers usually have rights to grazing and collection of forest produce for their own consumption (FAO, 1981).

Protection forest Areas within the forestry sector located on terrain that is too steep or rough, or subject to periodic or permanent inundation, which makes forest management impractical due to physical non-productivity (FAO, 1990).

Total area Refers to the total area of a country, including the area under inland water bodies. [Data are taken from the FAO Production Yearbook.]

Unclassed forest Forest land which is publicly owned but lacks any well-defined legal status (FAO, 1981).

Unclassified forest Forest land other than that legally reserved or that which is alienable, i.e. the rest (FAO, 1990).

Wildlife sector That part of government responsible for nature conservation.

Glossary of French terms

Domaine de chasse	Hunting reserve
Domaine forestier permanent de l'Etat	Permanent state forest
Domaine forestier rural de l'Etat	Rural state forest
Forêt de développement communautaire	Community development forest
Forêt classée	Classified forest
Forêt communale	Community forest
Forêt de production	Production forest
Forêt de protection	Protection forest
Forêt protégée	Protected forest
Forêt récréative	Recreation forest
Forêt rurale	Rural forest
Parc international	International park
Parc national	National park
Parc présidentiel	Presidential park
Parc régional	Regional park
Périmètre de protection	Protection area
Périmètre de reboisement	Reforestation area
Périmètre de restauration	Restoration area
Réserve de chasse	Hunting area
Réserve forestière	Forest reserve
Réserve de faune	Faunal reserve
Réserve de faune et de flore	Faunal and floral reserve
Réserve forestière	Forest reserve
Réserve intégrale	Strict reserve
Réserve naturelle gérée	Managed nature reserve
Réserve naturelle intégrale	Strict nature reserve
Réserve naturelle nationale	National nature reserve
Réserve naturelle partielle	Partial nature reserve
Réserve naturelle	Nature reserve
Réserve spéciale	Special reserve
Réserve partielle de faune	Partial faunal reserve
Réserve totale de faune	Total faunal reserve
Sanctuaire	Sanctuary
Zone protégée d'exploitation de la faune	Protected zone for faunal exploitation
Zone cynégétique	Sport hunting zone
Zone de chasse	Hunting zone
Zone d'intérêt cynégétique	Sport hunting zone
Zone tampon	Buffer zone

Glossary of Spanish terms

Area boscosa baja protección	Wooded area under protection
Area crítica	Critical area
Area de caza y pesca	Hunting and fishing area
Area de manejo integral de recursos naturales	Area of integrated natural resource management
Area de protección y recuperación ambiental	Environmental protection and recuperation area
Area de protección	Protection area
Area de protección de flora y fauna silvestre y acuática	Wild and aquatic flora and fauna protection area
Area de protección de recursos naturales	Natural resource protection area
Area de uso múltiple	Multiple use area
Area nacional de recreación	National recreation area
Area natural única	Unique natural area
Area recreativa	Recreation area
Area recreativa natural	Natural recreation area
Area silvestre	Wildland area
Biotopo natural y típico	Natural and typical biotope
Biotopo protegido	Protected biotope
Bosque de libre disponibilidad	Freely disposable forest
Bosque de producción	Production forest
Bosque de protección	Protection forest
Bosque de uso múltiple	Multiple-use forest
Bosque especial	Special forest
Bosque nacional	National forest
Bosque permanente de producción	Permanent production forest
Bosque permanente de protección	Permanent protection forest
Bosque productivo	Production forest
Bosque protector	Protection forest
Bosque protector	Protection forest
Campo experimental forestal	Experimental forest
Coto de caza	Hunting reserve
Estación biológica	Biological station
Lote boscosa	Forest plot
Manantial	Water source
Monumento cultural	Cultural monument
Monumento nacional	National monument
Monumento natural	Natural monument
Parque	Park
Parque forestal	Forest park
Parque histórico	Historic park
Parque litoral	Littoral park
Parque marino nacional	Marine national park
Parque municipal	Municipal park
Parque nacional	National park
Parque nacional marino	National marine park
Parque natural	Natural park
Parque regional	Regional park
Parque urbano	Urban park
Refugio	Refuge
Refugio de fauna silvestre	Wildlife refuge
Refugio de vida silvestre	Wildlife refuge

Reserva	Reserve
Reserva antropológica	Anthropological reserve
Reserva biológica	Biological reserve
Reserva communal	Communal reserve
Reserva de fauna	Faunal reserve
Reserva de fauna silvestre	Wildlife reserve
Reserva de la biosfera	Biosphere reserve
Reserva de producción de agua	Water production reserve
Reserva de producción faunística	Faunal production reserve
Reserva de recursos marinos	Marine resource reserve
Reserva ecológica	Ecological reserve
Reserva equivalente	Equivalent reserve
Reserva especial de la biosfera	Special biosphere reserve
Reserva fiscal	Fiscal reserve
Reserva forestal	Forest reserve
Reserva forestal de asentamiento comunal	Communal forest reserve
Reserva forestal de inmovilización	Closed forest reserve
Reserva geobotánica	Geobotanical reserve
Reserva indígena	Indigenous reserve
Reserva marina	Marine reserve
Reserva nacional	National reserve
Reserva nacional de recursos naturales	National natural resource reserve
Reserva nacional de vida silvestre	National wildlife reserve
Reserva nacional hidráulica	National hydrological reserve
Reserva nacional natural	National natural reserve
Reserva natural	Natural reserve
Reserva natural de vida silvestre	Natural wildlife reserve
Reserva natural privada	Private natural reserve
Reserva científica	Scientific reserve
Rutas y vías escénicas	Scenic routes and roads
Santuario de fauna silvestre	Wildlife sanctuary
Santuario de fauna	Faunal sanctuary
Santuario de flora	Floral sanctuary
Santuario de vida silvestre	Wildlife sanctuary
Santuario histórico	Historic sanctuary
Santuario nacional	National sanctuary
Sitio de patrimonio histórico-cultural o arqueológico	Historic-cultural heritage or archaeological site
Via parque	Parkway
Zona de interés turístico	Zone of touristic interest
Zona de repoblación	Reforestation zone
Zona de reserva para la protección de tortuga marina	Reserve zone for sea turtle protection
Zona de reserva para fauna migratoria	Reserve zone for migratory fauna
Zona protectora	Protection zone
Zona protectora forestal	Protection forest zone
Zona reservada	Reserved zone
Zona sujeta a conservación ecológica	Zone subject to ecological conservation

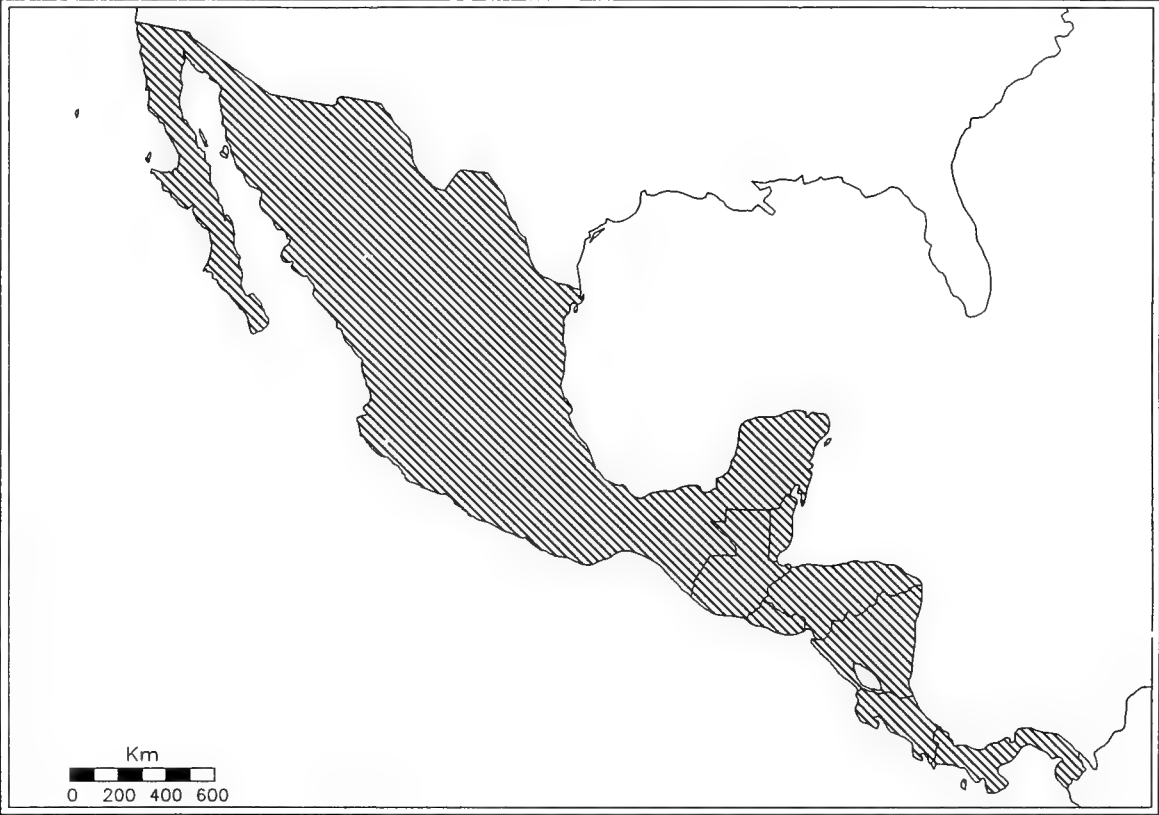
Glossary of Portuguese terms

Area especial de interesse turístico	Area of special tourist interest
Area de proteção ambiental	Environmental protection area
Area indígena	Indigenous area
Estação ecológica	Ecological station
Foresta nacional	National forest
Foresta estadual	State forest
Foresta municipal	Municipal forest
Local de interesse turístico	Locality of touristic interest
Monumento arqueológico o pre-histórico	Archaeological or prehistoric monument
Monumento natural	Natural monument
Parque de caça federal	Federal hunting park
Parque de caça estadual	State hunting park
Parque de caça municipal	Municipal hunting park
Parque nacional	National park
Parque estadual	State park
Parque indígena	Indigenous park
Parque municipal	Municipal park
Reserva biológica	Biological reserve
Reserva biológica nacional	National biological reserve
Reserva biológica estadual	State biological reserve
Reserva biológica municipal	Municipal biological reserve
Reserva ecológica	Ecological reserve
Reserva indígena	Indigenous reserve
Reserva particular do patrimonio natural	Natural heritage private reserve

PART I

SUBREGIONAL REVIEWS

11 CENTRAL AMERICA & MEXICO



11 CENTRAL AMERICA AND MEXICO

Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama

11.1 HISTORICAL PERSPECTIVE

Nature conservation had been practised in Central America and Mexico long before the Spanish conquest of 1521. The relationship of pre-hispanic cultures with their environment was characterised by a great respect for nature. One of the most notable examples in this subregion were the Maya Indians in northern Central America and southern Mexico who based their development on a balanced agricultural-forestry system which involved the strict protection of numerous areas, and provided "rest" periods for exploited areas.

The Spanish conquest marked a dramatic change in the way of life for pre-hispanic indigenous cultures. The new rulers viewed the continent as an inexhaustible source of resources, resulting in excessive depreciation of the land. This process has continued to the present day with even more devastating effects as population pressures increase and technology advances. Since the 1950s nearly half of the forests of the Central American and Mexico subregion have been destroyed for timber extraction and conversion to agricultural land. The effects, such as soil erosion, the silting up of dams and rivers, and wildlife depletion, have been long ranging.

The establishment of managed areas in the subregion dates back to the end of the 19th century and the beginning of the 20th century. Protection of natural areas arose largely from the desire to ensure continuation of exploitable forest resources, thus natural wildlands and wildlife conservation have their origins in the forestry sector. The first recorded managed areas were the municipal sawmills (*astilleros municipales*) in Guatemala in 1870, comprising natural forests specifically managed for the extraction of forest products, and the *Desierto de los Leones* in 1876 in Mexico, which became a national park in 1917.

Conservation area development has followed a different course in each country in the subregion, depending on its particular priorities and history. In Mexico, for example, there was a boom period of conservation area development during the 1930s although governmental emphasis was more on the recreational aspects of nature than conservation as such. Factors that have had the greatest influence on the establishment of conservation areas in Central America began in the 1950s and 1960s, with the increasing importance of recreation, together with the need to meet demands for timber production, and the subsequent pressure this placed on the environment (Ugalde and Godoy, 1992). Natural resource degradation in the subregion became increasingly apparent in the early 1970s, and emphasised the need to set aside areas to slow this process.

All countries in Central America and Mexico have legal provisions for the establishment of conservation areas, but these vary in the extent of detail provided and are not always in the form of separate conservation legislation, but may be part of the forestry legislation. Separate legislation specifically for the consolidation of conservation areas has been enacted in Belize, Guatemala, Nicaragua and Mexico, and proposals for such legislation have been put forward in the remaining countries.

The creation of specific organisations for conservation area management began during the 1970s. In all countries in the subregion, except Belize, conservation area administrations have now been upgraded from a division within the forestry department to the level of a separate, autonomous or semi-autonomous directorate.

Much of the land within conservation areas in the subregion is privately owned, which can result in conflicting interests in some cases. On the other hand, private reserves constitute an important contribution to the conservation area networks in several countries, and are often managed in coordination with national conservation authorities (see Section 11.4.2)

11.2 NATURE CONSERVATION POLICY AND LEGISLATION

Legal provisions for the establishment of conservation areas exist to various extents in all countries in the subregion. These are summarised in Table 11.1 and reviewed below. Some provide detailed definitions of management categories, regulations, and processes of establishment for conservation areas. Others make only a general reference to 'national parks and equivalent reserves', further details of which are given in the separate legislation providing for the creation of individual areas. New nature conservation legislation to standardise the process of establishing conservation areas and consolidating them into a national system has been drafted in El Salvador, Costa Rica, Honduras and Panama.

11.2.1 Forestry Sector

Policy Although a country may not have developed a specific forest policy as such, this may be inferred from the relevant forestry legislation. In the past, forest policies in the subregion have been directed principally towards the exploitation of forest resources, and protection was included only to reserve areas of forest for future development. National policies regarding forest conservation, management and development are unclear and inconsistent in many countries.

Most countries in the subregion have nationalised all forests. As such, forests are within the public domain, and it is in national interests to protect them. Privately-owned forest may be expropriated for these purposes. The evolution of national forest policies to incorporate measures for the conservation and protection of forest resources has taken place at different rates and to a different extent in each country in the subregion. In Honduras, for example, forest policy is still directed more towards extraction than protection of forest resources. However, Belize initiated a particularly far-sighted forest policy in 1954 which acknowledges the importance of protecting forests as watersheds, drainage basins and for climatic stability, and aims to promote public awareness of forest conservation and rational utilisation. In Nicaragua, significant changes in governmental policies regarding all natural resources took place immediately following the 1979 Revolution. Provisions for forest conservation and managed areas were included in the 1987 political constitution for the first time in the nation's history.

All countries in the subregion, except Mexico, participate in the Tropical Forestry Action Plan (TFAP) of the FAO. As a result, participating countries have developed national forestry action plans that include measures to improve the effectiveness of forest conservation, while maximising the contribution of the forestry sector to national development. These plans often constitute the current forest policy of the respective country.

Legislation Forestry legislation dates back to the early part of this century, as in Mexico (1909), for example, Guatemala (1921) and Belize (1927). The establishment of delimited forested areas for regulated use and management dates back to the 1920s. The 1926 Ley Forestal in Mexico makes the first reference to protected forest areas under national legislation. The 1927 Forest Ordinance of Belize provided for the creation of forest reserves within which timber extraction is strictly regulated. Similar provisions were introduced in Costa Rica in 1939. Details for other countries are either not known or there were no such provisions prior to current legislation.

Existing forestry legislation provides for the reservation of forests under a variety of designations for each country in the subregion. All countries have provisions for the creation of *reservas forestales* (forest reserves), but restrictions on resource use within them varies from partial protection of forest resources, as in Mexico and Costa Rica, to commercial production as in El Salvador and Honduras. In Belize and Guatemala forest reserves have both protective and extractive functions. In Panama the term applies generally to any forested area under management for whatever purpose, according to its respective designation. Forestry legislation within both Guatemala and Costa Rica contains provisions that prohibit logging for certain extension around water sources, rivers and lakes, (see Annex 11.2 for details of individual countries).

In all countries the first reference to conservation areas is found in the forestry legislation. In Costa Rica (1990), El Salvador (1973), Honduras (1984) and Panama (1966) the establishment of national parks and other conservation areas is still dependent on forestry legislation, although these areas are no longer managed by the forestry sector itself.

11.2.2 Wildlife Sector

Policy Few countries in Central America, or Mexico, have officially established specific national conservation policies relating to the establishment and management of conservation areas, although these may be inferred from current legislation, such as in Mexico and Guatemala.

Practically all countries in the subregion have drafted action plans for formulating a comprehensive national conservation policy, which are essentially guides for the implementation of new proposed legislation for consolidating conservation areas into a national system (Ugalde and Godoy, 1992). The national policy proposed by Costa Rica is innovative in that it aims to incorporate local populations into managed area establishment and management to a far greater degree than is currently the case. This new policy, when adopted, will be the first of its kind in Latin America.

Legislation Specific conservation areas legislation began to emerge in the 1980s, and, from this time onwards, many countries enacted laws defining designations along internationally recognised criteria, and adapted the concept of planning and establishing national conservation area networks. Such laws have been enacted in Belize (1981), Mexico (1988) and Guatemala (1990). Nicaragua (1979) passed legislation that provides for the establishment of a conservation area system, but in less detail than the other laws mentioned above in that reference is made only to national parks and other protected areas without providing clear definitions of management categories.

In Costa Rica, although the main legislative act for conservation areas currently in effect is the 1990 *Reforma de la Ley Forestal*, extensive provisions are made within it for a national conservation area network under the management of the wildlife sector. In Panama, conservation areas are created under provision of individual decrees from the wildlife sector, but provision is not made for unifying such areas into a national network. Honduras and El Salvador have neither separate conservation areas legislation nor comprehensive provisions for a national network under current forestry laws.

Present nature conservation legislation in the subregion provides for the creation of around 14 different management categories, some of which appear to be unique to particular countries (Table 11.1). Categories common to all countries in the subregion are national park and various reserves, most often natural or biological reserves, but referred to simply as "equivalent reserves" in El Salvador. All countries have provisions for strictly protected areas, but this has not been employed in El Salvador or Honduras. In Mexico the category is used for special biosphere reserves (*reservas especial de la biosfera*).

Mexico and Guatemala use the designation biosphere reserve in their national systems to indicate integration of local populations and indigenous communities along the lines of the Unesco MAB programme. Mexico was the first country in Latin America to employ the biosphere reserve concept nationally, although Costa Rica has plans to reorganise its entire managed area system on the basis of this concept, and would thus become the first country to have all its conservation areas managed as biosphere reserves.

11.2.3 Additional Sectors

Policy Particularly notable among other sectors responsible for managed areas in a number of countries in the subregion is that of indigenous affairs, which manages indigenous reserves. These reserves contribute to the total protection of natural ecosystems, although they are not generally considered part of the national networks of conservation areas which are managed by the wildlife sector.

In those countries in the subregion which do not specifically establish indigenous reserves under a separate sector, land is set aside for indigenous communities under the wildlife sector through such categories as national biosphere reserve employed in Mexico and Guatemala. Likewise, the international designation of biosphere reserve often includes traditional indigenous territories within its boundaries, such as in Rio Platano Biosphere Reserve in Honduras. Nicaragua has recently set aside a significant area for protection as a biological reserve, in conjunction with indigenous Miskito communities.

Efforts to establish reserves for indigenous people in Central America and Mexico began in the late 1930s, but it was not until the 1970s that this idea was put into practice (Houseal *et al.*, 1985). Indigenous agencies began to take active roles in negotiating the protection of the land where their people have traditionally lived, and managed areas were established, either through the governmental institutes responsible for indigenous affairs or through those responsible for conservation areas. Until recently, however, indigenous reserves were viewed as geo-political divisions and not managed areas as such (Houseal *et al.*, 1985). The sector for indigenous affairs makes a significant contribution to managed area coverage in Panama and Costa Rica.

Legislation Although a number of indigenous areas have been named and located in Panama, only two, Kuna Yala Comarca and the Embera Comarca, have been legally established to date. Many of the areas have not been clearly delimited.

Indigenous reserves in Costa Rica rely for their creation on individual decrees through the Comisión Nacional de Asuntos Indígenas. In other countries in the subregion, indigenous or anthropological reserves may also be created *via* individual decrees or under current legislation of the wildlife sector.

11.3 MANAGED AREAS ADMINISTRATION

Significant advances in the administration and management of natural resources in the subregion began in the 1970s with the establishment of high level governmental organisations specifically responsible for natural resources and the environment. Following their creation, administrative responsibilities for managed areas (including conservation areas) are generally incorporated into them, except for Mexico and Guatemala where the forest department remains under a separate ministry. Environmental ministries now exist in all countries in the subregion except El Salvador, where there is the Centro de Recursos Naturales within the Ministerio de Agricultura y Ganadería.

11.3.1 Forestry Sector

Forest administration is the responsibility of the forest departments/directorates of respective countries (Table 11.1). These date back to early this century, as in the case of the Junta Central de Bosques y Arboladas of Mexico established in 1901, followed by Guatemala which created its first forestry institute, the Servicio Forestal, in 1921. Current forestry institutes date back to more recent times: Mexico (1960), Costa Rica (1969), Honduras (1974), Nicaragua (1979), Panama (1975) and El Salvador (1973), Guatemala (1989). The date of creation of the current forestry institute in Belize, the Forest Department, is not known, but it was established by the time of the 1954 Forest Policy.

Forestry institutes generally have a broad field of responsibilities from commercial exploitation to protection and regeneration of forest resources to ensure the continuity of forest use. In Guatemala and Costa Rica, high level governmental advisory bodies assess the activities of the forestry sector with regards to the protection and use of forest resources. A similar advisory body has been proposed in Honduras for all environmental issues.

Various designations of managed areas come under the responsibility of the forestry sector, with the degree of protection afforded by each varying between the countries in the subregion. For example, the category forest reserve is employed by all countries and generally indicates partial protection of forest resources, except in El Salvador and Honduras where such reserves are productive. In Belize and Guatemala, forest reserves have both protective and productive functions. Forestry institutions also manage protective forests or protective forest zones in countries where these categories are found.

The forestry sector is only responsible for conservation areas management in Belize, where there is no separate governmental divisions for this purpose, and Honduras where the situation is unique in that the responsibilities of the separate conservation institute are being returned to the forestry sector (discussed below).

11.3.2 Wildlife Sector

Conservation area administration has arisen from within the forestry departments of respective countries. Generally, divisions were established within forestry departments for the management of natural resource protection which have subsequently been upgraded to separate departments/directorates in their own right. Only in Belize has this not been the case, but plans are under way to establish a Conservation Division within the Forest Department in the near future.

In Honduras the situation is somewhat different. The Dirección General de Recursos Forestales y Vida Silvestre was established in 1974 to manage conservation areas, but has subsequently been inactive owing to the lack of

funding and governmental support. Plans are underway to abolish this institute, and to revise the administrative structure of the forestry institute to incorporate conservation areas management (Muñoz, 1991; Yates, 1987).

The situation in Guatemala is also unique in that the institute responsible for managed areas is at the ministry level, directly dependent on the president of the republic. This is the only country in the subregion to afford such high level to managed area administration.

11.3.3 Additional Sectors

In Costa Rica and Panama, indigenous reserves are administered by the respective institutes of indigenous affairs. The respective communities often have direct responsibility for managing their protected territory in cooperation with governmental institutions. Inter-institutional councils may be created to supervise the management of indigenous territory.

The tourism sector is involved in conservation area management in El Salvador and Panama, where national tourism institutes manage one or more national parks through cooperative agreements with the respective conservation authority. In Panama, a similar agreement has also been reached with the Instituto de Recursos Hidrológicos de Estado regarding the management of areas protected for their water resources. In Belize and Mexico some marine reserves area managed by the respective fisheries departments.

Historically, the situation regarding conservation area management in Guatemala has been very complex, with responsibilities divided among a large number of separate agencies from various sectors whose interests often overlapped. Currently, the activities of around 60 institutions, of which 29 are state-run or independent and the remaining are national or international non-governmental organisations, are directly or indirectly related to conservation areas. The activities of these institutions are coordinated by the high level Consejo Nacional de Areas Protegidas, following its creation in 1989. Areas may also be managed directly by the Consejo itself.

11.3.4 Non-Governmental Organisations

Non-governmental organisations are involved in conservation area management in several countries in the subregion. For example, in El Salvador the Fundación Ecológica Salvadoreña Activo 20-30 cooperates in the management of El Imposible National Park.

The greatest contribution to conservation area management by an NGO occurs in Belize, where the Belize Audubon Society is in fact the principal institution responsible for conservation activities in the country. Through an official agreement, it works in close coordination with the government of Belize, and NGOs are an integral part of the conservation area administration within the country.

Private reserves constitute an important contribution to the conservation area networks in a number of countries in the subregion, notably Belize, Guatemala and Costa Rica (see Section 11.4.2). National legislation in these countries makes provision for the management of private reserves in coordination with the respective governmental conservation authorities.

11.4 MANAGED AREA STATUS

The managed area system is mapped for each country within the subregion in Fig. 11.1 (Part III). Lists of individual conservation/managed areas are given in Annex 11.1 which also serves as a key to the maps. More than half, 56.3%, of the managed area network falls within the domain of the wildlife sector, the forestry sector is responsible for some 31.9% and other sectors (notably indigenous affairs), 11.7%.

11.4.1 Managed Areas within the Forestry Sector

Coverage Legally notified natural forest lands account for at least 34.4% of the total area of the subregion (Table 11.2). However, this figure is subject to inaccuracy owing to the lack of information for certain countries and difficulties of forest classification. All countries in the subregion have substantial areas of forest that are state-owned or nationalised, and many countries, such as Nicaragua and Panama, have nationalised all forest in general. Figures for the percentages of the total area that these forests represent are not available.

Data from Table 11.2 indicate that managed areas within the forestry sector account for some 34.4% of the total area of the subregion. It appears that most of the forest estate in the subregion has been allocated for protection purposes. However, data for production forest is frequently incomplete or lacking, and figures may be greater than indicated here. Several countries appear to have fairly high proportions of their forest estate under protection by the forestry sector. For example, legally gazetted reserves managed by the forestry sector for protection account for 36.4% of the total area in Mexico, and 24.4% in Panama.

11.4.2 Conservation Areas within Forestry, Wildlife and Additional Sectors

Coverage There are 658 legally designated conservation areas in the subregion, covering a total of 90.5 million ha or 36.5% of the total area. Approximately 32.5% of these areas are under total protection, covering 1.7% of the subregion (Table 11.3). The forestry sector is directly responsible for some 362 conservation areas, covering a total area of 73.9 million ha or 29.8% of the subregion. However, these figures include a significant area of land (68,770,365ha) covered by the 223 protection forest zones in Mexico whose actual effectiveness as conservation areas is in doubt (see Section 11.4.2, Effectiveness).

The percentage of national territory covered by the conservation area network varies between the countries in the subregion. Mexico appears to have the greatest coverage, with 41.6% of the national territory covered by conservation areas. As mentioned above, however, this figure includes a large number of areas with uncertain protective function, although legally notified as protection forests. Panama and Costa Rica have the next highest coverages, with 35.9% and 32.8% of the total national territory respectively covered by conservation areas including indigenous reserves. Of these figures, 17% and 10%, respectively, account for strictly protected areas.

Both Guatemala (15.4%) and Nicaragua (14.1%) have recently expanded their conservation area coverages significantly to the present figures. El Salvador has the lowest coverage of conservation areas, accounting for only 1% of national territory.

Privately-owned reserves make a notable contribution to the conservation area coverage in a number of countries in the subregion. Generally, they have not been included in this analysis except in the case of Costa Rica, where its seven private reserves are incorporated into the national network of conservation areas and are supported by the government. Current information indicates that there are three private reserves in Belize covering 72,258 ha; nine in Mexico covering 7,415 ha; and a number in Guatemala, but further details are not available. Actual numbers of privately-owned reserves within the subregion may be higher.

Representativeness The representativeness of conservation area coverage varies greatly between the countries in the subregion. In Costa Rica, the national network of conservation areas is very comprehensive, incorporating 19 of the 20 Holdridge life zones identified in the country, whereas very few of the national ecosystems in El Salvador are under protection. Detailed information on other countries in the subregion is not available. However, both Nicaragua and Guatemala have improved the representation of national ecosystems within their conservation area networks significantly by recent expansions.

Integrity Data in Table 11.4 indicate the mean size of conservation areas, where information is available. Where sizes for individual sites are not known they have not been included in the analysis, such as in Mexico where the 223 protection forest zones have been excluded for this reason. Therefore, the picture indicated by Table 11.4 is subject to inaccuracies.

Using mean size as a measure of integrity, the data indicate that conservation areas under the forestry sector tend to be largest in Guatemala, which has the smallest actual number of sites (apart from El Salvador which does not have any). On the other hand, Costa Rica has the largest number of conservation areas within the forestry sector, but they tend to be on the small side, with around 30% of the areas covering less than 1,000ha.

Within the wildlife sector, Mexico has the largest mean size of conservation area, whereas El Salvador has by far the smallest. Mexico also has the greatest number of actual sites (105), but as it is by far the largest country in the subregion, this may be expected. Panama has a wildlife sector conservation area network that comprises a small number of large areas. In all the other countries, networks appear to be made up of larger numbers of relatively small areas. This trend is also reflected in the conservation areas managed by additional sectors, notably the sector for indigenous affairs, where Panama has a few large areas (66% of which are greater than 100,000ha) and Costa Rica has a large number of smaller areas (96% of which are between 10,000 and 100,000ha).

In the subregion as a whole, the mean size of partially protected areas is more than double that of totally protected areas within the forestry sector, and more than six times greater within the wildlife sector, which may appear surprising. However, there are twice as many totally protected areas than partially protected within the wildlife sector, but they tend to be small, with 38% of them under 1,000ha. A relatively small number of very large partially protected areas, such as in Mexico, affects the overall picture for the subregion. Panama has by far the largest mean size of totally protected areas in the wildlife sector, almost entirely composed of national parks.

Effectiveness Conservation efforts in the subregion are limited by weaknesses in policy and legislation, inadequate institutional support and ineffective management. As mentioned in Section 11.2, nature conservation policies are lacking in the majority of the countries in the subregion.

The lack of adequate conservation legislation is a limiting factor in many countries. Existing legal provisions regarding conservation areas are often confused or contradictory, and scattered throughout a number of different legislative acts. Criteria and procedures for establishment are frequently absent. Notable exceptions are Guatemala and Mexico where recent legislation has provided a framework for the establishment and development of an integrated conservation area network at the national level, and Costa Rica where adequate provisions are found within forestry legislation.

Institutional resources for conservation areas management is one of the most recurring and critical problems limiting conservation activities in the subregion, and greatly reduces the capability of such institutions in terms of equipment, training and number of personnel. This results in problems of regulation enforcement, and contributes to encroachment into conservation areas which is common throughout the subregion, particularly in Mexico where up to 25% of national parks affected (Perez Gil, 1992; Ugalde and Godoy, 1992). Many areas that are legally notified for protection may not be fulfilling this function in practice as a result of a lack of resources. An important example is found in Mexico with respect to the 223 protection forest zones, many of which exist on paper only and are not protected on the ground (Vargas Márquez, 1990). As the areas have been legally notified, however, the figure for the total area covered by them has been included in this analysis, as appropriate, even though the resulting picture may be somewhat misleading.

Land shortages and tenure disputes obstruct the effectiveness of managed areas in much of the subregion, and contribute to the trend of migration into conservation areas. A substantial amount of land within conservation areas is still privately-owned. For example, in Costa Rica, 15% of the land within conservation areas is in private hands. The situation is worse in Guatemala where some 70% remains privately-owned or has been claimed by migrants in the past 15 years. In most cases there is no information on the number of inhabitants claiming land within conservation areas. Panama, Costa Rica and Guatemala are trying to acquire land in priority areas, but lack of financial resources is a limiting factor in this process.

Both Nicaragua and El Salvador have suffered long-term civil strife which severely hindered all aspects of their economic and social stability. Subsequently, nature conservation was afforded low priority during the past decade, although both countries have now come to peace agreements with the respective insurgent groups, and are making considerable efforts to improve the situation of conservation areas.

11.4.3 Contribution of the Forestry Sector to Nature Conservation

Data in Table 11.3 suggest that the contribution of the forestry sector to nature conservation is greater than that of the wildlife sector, both in terms of the number of areas under protection and conservation forest (55% of total conservation areas) and their coverage (81% of the total coverage of conservation areas). It must be noted, however, that these figures include a significant area of land covered by the 223 protection forest zones in Mexico which, as mentioned elsewhere, do not necessarily have protective functions in practice.

Furthermore, as mentioned in Section 11.2.1, forest legislation in both Guatemala and Costa Rica have provisions that prohibit logging for certain extensions around water sources, rivers and lakes (see Annex 11.2 for details of individual countries), but national statistics of the extent of forest lands meeting such criteria are not available. Thus, the contribution of the forestry sector to protection and conservation may be higher than suggested by the statistics in Tables 11.2. and 11.3.

Although only 37% of the conservation network falls within the domain of the wildlife sector, data in Table 11.4 indicate that areas are afforded greater protection under this sector than under the forestry sector. Over 76% of the totally protected areas come under the domain of the wildlife sector, compared with only 19% under the forestry sector.

11.5 FUTURE PROSPECTS

11.5.1 Expanding the Conservation Area Network

According to information in Table 11.3, official proposals to expand the conservation network in the subregion total some 3.5 million ha, or 1.4% of the total area.

However, the comprehensiveness of data for proposed sites varies from country to country, and there may be many proposed areas that have not been included. For example, following the Agrarian Reform of 1981-1982 in El Salvador, around 40 new areas totalling 13,000ha were identified as priority areas for future protection. These have not been included in the tables owing to the lack of specific details available. Likewise, in Nicaragua, 35 new areas were identified by the national conservation authority in 1983 for protection, but the lack of further details precludes their incorporation into the tables. The 1989 law that consolidated conservation areas in Guatemala also declared 44 new sites as under 'special protection', to be delimited and designated appropriate management categories at a later date. Not all of these have been included in the tables as details are not available.

11.5.2 Other National Initiatives

Strengthening networks Consolidating conservation areas into a coordinated national system, by means of a unifying legislative act where this has not already occurred, is the main objective of all countries in the subregion. Such legislation would provide the necessary legal framework for conservation area establishment and maintenance and, by unifying them under one administrative organisation, their management would be strengthened significantly. As mentioned in Section 11.4.2, this has been achieved in Guatemala, Mexico and Costa Rica, and proposals for such legislation have been put forward in Honduras, El Salvador, and Panama.

Costa Rica has initiated an ambitious plan to restructure and strengthen its conservation area network, based on the incorporation of local populations into its management to a far greater extent than is currently found anywhere in the subregion. The passage of new conservation legislation to consolidate this process is awaited, as, although adequate provisions for conservation areas exist, these are under forestry legislation. Nicaragua

and Guatemala have also recently strengthened and significantly expanded their conservation area networks through national initiatives.

Overcoming Economic Constraints As mentioned in Section 11.4.2, lack of funding is one of the most severe factors limiting the efficiency of managed area management. International tourism has become an increasingly important motive for establishing conservation/managed areas in the subregion, although at present only the conservation area system in Costa Rica derives notable benefit directly from this activity, and even then not at the local level.

Since the mid-1980s the debt-for-nature swap mechanism has been in effect in several countries in the Central American and Mexico subregion, whereby the national debt of the country is reduced in exchange for increased environmental protection. This has provided significant amounts of money for conservation activities in the countries involved, often directed through an NGO. Such agreements have been affected in Panama, Costa Rica and Guatemala.

Both Nicaragua and El Salvador have suffered from a significant lack of international assistance at the governmental level, and even economic blockades during periods of civil unrest. However, WWF and IUCN maintained their support, and, together with other international NGOs, are currently in the process of implementing a number of projects to assist conservation activities in both countries.

Improving Management Honduras is in the process of strengthening its natural resource administration by revoking the creation of a conservation area institution that proved inoperable, and consolidating all responsibilities into one institution, the Corporación Hondureña de Desarrollo Forestal. This institute is to undergo official restructuring awaiting the passage of proposed new legislation.

Conservation area management in Costa Rica has been hindered by conflicts between governmental authorities and local communities in many cases. The new conservation area system proposed is to comprise units called áreas de conservación (conservation areas), which include human settlements and involve local populations in all administrative decisions. Belize proposes to establish a conservation division within the Forest Department to take on conservation area management which is currently largely the responsibility of an NGO.

In all countries in the subregion, increased cooperation between the institutes involved in natural resource management is sought, including involving NGOs to a greater extent.

11.5.3 International Initiatives

Conventions and Programmes All countries in Central America and Mexico participate in one or more international conventions and programmes concerned with conservation areas (Table 11.5). All eight countries have ratified the Convention Concerning the World Cultural and Natural Heritage (World Heritage Convention), and only Belize, El Salvador and Nicaragua have not yet had a natural area inscribed on the World Heritage list. Costa Rica, Guatemala, Mexico and Panama have all ratified the Ramsar Convention. In Mexico, eight areas have been designated as biosphere reserves and are managed along the MAB guidelines, but only six of these have been officially designated as part of the international network of biosphere reserves. Panama, Costa Rica and Guatemala also participate in the Unesco Man and the Biosphere Programme.

Cooperative agreements All countries, except Honduras and Belize, have signed the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Convención sobre la Protección de la Flora, de la Fauna y de las Bellezas Escénicas Naturales de los Países de América) (Western Hemisphere Convention). Most countries in the Western Hemisphere are party to this convention, which provides the basic principles for establishing and managing conservation areas as well as promoting other conservation activities.

All countries in the subregion participate in the Red Latinoamericana de Cooperación Técnica en Parques Nacionales, Otras Areas Protegidas, Flora y Fauna Silvestres (Latin American Network of Technical Cooperation in National Parks, Other Protected Areas, Flora and Wildlife) programme of the FAO. This programme aims to coordinate the activities of participating countries to assist in the implementation and functioning of a coherent and effective national system of conservation areas in each country. The network

does not directly generate funds itself, but encourages exchanges of information and experience *via* meetings and newsletters, by which countries may assist one each other in strengthening their conservation area systems.

A recent initiative has been established by The Nature Conservancy in the US, in conjunction with government and non-government organisations in Latin America and the Caribbean. Called 'Parks in Peril, a Conservation Partnership for the Americas', the partnership intends to select 20 critical sites each year for ten years and to provide comprehensive on-site conservation management for them, to prevent any deterioration of their quality.

Transboundary managed areas have had an increasingly high profile in Central America in recent years. Through cooperative binational or trinational agreements, several such areas have been established: La Amistad Reserve between Costa Rica and Panama (1982); Trifinio Biosphere Reserve between Guatemala, Honduras and El Salvador (1987); and the complex of Protected Areas for Peace (Si-A-Paz) between Nicaragua and Costa Rica (1990). Collaboration is also planned under the Rio Coco/Bosawas/Rio Platano/Tawanka project between Honduras and Nicaragua; for the Chiquibul/Mayan Mountain project between Guatemala and Belize; and the establishment of a conservation area complex in the Gran Petén between Mexico, Guatemala and Belize. Further details of transboundary managed areas in Mexico are not known.

11.6 PRIORITIES FOR ACTION

Priorities for conservation action in the subregion were recently reviewed by IUCN (1992) in preparation for the IV World Parks Congress. They are of a general nature, as priorities for action will vary according to national conservation objective, history and political support. They provide a foundation for more specific priorities identified in this report and summarised in Table 11.6.

Recommendations include: conducting a systematic review and inventory of the biological richness of conservation areas in each country, and establishing monitoring centres to maintain up- to-date information on managed area effectiveness; developing and implementing management plans for all managed areas; encouraging closer cooperation with NGOs and other private organisations to strengthen managed area management and to establish small reserves on privately-owned land; and to encourage international support for long-term funding projects and expanding ecotourism potentials.

One of the greatest challenges facing managed areas in the subregion is to involve local populations in the management and maintenance of managed areas and to generate direct, tangible benefits from conservation activities. This is being addressed in Costa Rica by its innovative plans for restructuring its entire conservation area network.

REFERENCES

- Comisión IRENA-CORFOP (n.d.). Patrimonio forestal: análisis critico de situación actual y recomendaciones. Unpublished report.
- Cruz, G.A. (1986). *Areas silvestres de Honduras*. Asociación Hondureño de Ecología, Tegucigalpa, Honduras. 49 pp.
- Detlefsen, G., Castañeda, L.A., Oliva, E. (Eds) (1991). *Plan de acción forestal para Guatemala (PAFG)*. Oficina del Plan de Acción Forestal para Guatemala, Guatemala. 227 pp.
- Garita, D. (1989). Mapa de cobertura boscosa de Costa Rica. Unpublished report. Dirección General Forestal, Unidad de Cartografía y Topografía, Ministerio de Recursos Naturales.
- Houseal, B., MacFarland, C., Archibold, G., Chiari, A. (1985). Indigenous cultures and protected areas in Central America. *Cultural Survival*, March: 10 - 19.
- IRENA (1990). La cobertura boscosa de Panamá. Trabajo realizado conjuntamente por la Dirección Nacional de Desarrollo Forestal y la Dirección de Planificación, Panamá. 8 pp.
- Mendez, J., L. (1992). Towards a Latin American strategy for the salvation of wildlife. Servicio Autonomo de Fauna (PROFAUNA), Ministerio del Ambiente y los Recursos Renovables (MARNR), República de Venezuela. 16 pp.
- Muñoz, E. (1991). Perfil general del Departamento de Areas Protegidas y Vida Silvestre. 8 pp.
- Perez Gil, R. (1992). Regional Review: North America (Mexican section). Regional reviews, IUCN, IVth World Congress on national parks and protected areas, Caracas, Venezuela, 10-21 February 1992. Pp. 12.3-12.29.
- Ugalde, A. and Godoy, J.C. (1992). Regional Review: Central America. Regional reviews, IUCN, IVth World Congress on national parks and protected areas, Caracas, Venezuela, 10-21 February 1992. Pp. 13.3-13.27.
- US-AID (1988). Tropical forests/biodiversity. Annex to US-AID/Belize FY 80-90 Action Plan, March 1988. 26 pp.
- Vargaz Márquez, F. (1984). *Parques nacionales de México y reservas equivalentes*. Instituto de Investigaciones Económicas, UNAM. 266 pp.
- Vargas Márquez, F. (1990). Las áreas naturales "protegidas" en Mexico; una utopía, basada en simulaciones, mitos, demagogia y autoritarismo. Mexico, D.F. 107 pp.
- Yates, E. (1987). Perspectiva del derecho de recursos naturales en Honduras. Tegucigalpa, Honduras, 27 pp.

Table 11.1 Legal provisions for protected areas, with year of enactment and responsible administrative authority. Protected areas are classified according to management objective (T = total protection, P = partial protection, L = forest land under local extractive use, C = forest land under commercial extractive use).

Country	Legislation Year	Legislation Title [Sector]	Administrative authority	Managed areas Man. Designation
Belize	1927	Forest Ordinance [F]	Forest Department	C/P Forest reserve
	1981	National Parks System Act No. 5 [F]	Forest Department	T National park T Nature reserve T Natural monument T Wildlife sanctuary
	1977	Legislation unknown [A]	Belize Audubon Society	P Bird Sanctuary
	?	Legislation unknown [A]	Unknown	P Archaeological reserve
	1991	Legislation unknown [F]	Dirección General Forestal	P Bosque nacional
	1990	Reforma a la Ley Forestal No. 7174 [F]	Dirección General Forestal	P Reserva forestal P Zona protectora P Refugio de vida silvestre
Costa Rica	1990	Reforma a la Ley Forestal No. 7174 [W]	Servicio de Parques Nacionales	T Parque nacional T Reserva biológica
	1973	Unknown legislation [W]	Servicio de Parques Nacionales	T Monumento nacional
	Various	Individual decrees [A]	Comisión Nacional Asuntos Indígenas	L Reserva antropológica

El Salvador	1973	Ley Forestal Decreto No. 268 [F] Individual decrees [W]	Servicio Forestal Servicio de Parques Nacionales y Vida Silvestre Servicio de Parques Nacionales y Vida Silvestre	C P P T T	Reserva forestal Zona protectora Refugio de vida silvestre Parque nacional Reserva equivalente (i.e. Reserva biológica)
Guatemala	1990	Reglamento de Ley de Areas Protegidas, Acuerdo Governativo No. 759-90 [F]	Dirección General de Bosques in cooperation with Consejo Nacional de Areas Protegidas	P	Reserva forestal
	1990	Reglamento de Ley de Areas Protegidas, Acuerdo Governativo No. 759-90 [W]	Various institutions: conservation management activities coordinated by Consejo Nacional de Areas Protegidas	P P T P T T T P P P T L P	Area de uso multiple Area recreativa natural Biotopo protegido Manantial Monumento cultural Parque histórico Parque nacional Parque regional Refugio de vida silvestre Reserva biológica Reserva de la biosfera Rutas y vías escénicas
	1990	Reglamento de Ley de Areas Protegidas, Acuerdo Governativo No. 759-90 [A]	Various institutions: conservation management activities coordinated by Consejo Nacional de Areas Protegidas	P	Reserva natural privada

Honduras	Various	Individual decrees [F]	Corporación Hondureña de Desarrollo Forestal	C	Reserva forestal
	1984	Reglamento General Forestal, Acuerdo No. 634 [F]	Corporación Hondureña de Desarrollo Forestal	P T T T T P	Zona protectora forestal Parque nacional Monumento natural Reserva biológica Monumento cultural Refugio de vida silvestre

Mexico	?	Legislation unknown [F]	Dirección de Reforestación y Manejo de Suelos Forestales	P	Zona de repoblación
	1960	Ley Forestal [F]	Dirección de Reforestación y Manejo de Suelos Forestales	P	Parque forestal
	1986	Decree [W]	Dirección General de Parques, Reservas y Areas Ecológicas protegidas	P	Campo experimental forestal
	?	Legislation unknown [W]	Dirección General de Parques, Reservas y Areas Ecológicas Protegidas	P	Reserva forestal
	1988	Ley General del Equilibrio Ecológico y la Protección al Ambiente [W]	Dirección General de Parques, Reservas y Areas Ecológicas Protegidas	P	Zona protectora forestal
				P	Zona reserva para la protección de tortuga marina
				P	Zona reserva para fauna migratoria
				P	Reserva de fauna
				P	Reserva marina
				P	Biotopo natural y típico
				T	Parque
				P	Refugio
				P	Area de protección de flora y fauna silvestre y acuática
				P	Area de protección de recursos naturales
				T	Monumento natural
				T	Parque marino nacional
				T	Parque nacional
				P	Parque urbano
				L	Reserva de la biosfera
				T	Reserva especial de la biosfera
				P	Zona sujeta a conservación ecológica
				P	Santuario de la balein

Nicaragua	1991	Decree No.43-91 [W]	Servicio de Parques Nacionales	L	Reserva biológica
	1991	Decree No. 44-91 [W]	Instituto Nicaragüense de Recursos Naturales	P	Reserva nacional de recursos naturales
	1983	Decree No.1320 [W]	Servicio de Parques Nacionales	P	Reserva nacional natural
	?	Legislation unknown [W]	Servicio de Parques Nacionales	P	Refugio de vida silvestre
	?	Legislation unknown [W]	Servicio de Parques Nacionales	P	Area silvestre
	1979	Ley de Creación del Servicio de Parques Nacionales	Servicio de Parques Nacionales	T	Parque nacional
				T	Reserva natural
Panama	?	Legislation unknown [F]	Dirección Nacional de Desarrollo Forestal	P	Reserva forestal
	1966	Ley General Forestal, Decreto-Ley No. 39 [F]	Dirección Nacional de Desarrollo Forestal	P	Reserva de producción de agua
	Various	Individual decrees [W]	Dirección Nacional de Areas Protegidas y Vida Silvestre	P	Reserva nacional
				C	Bosque productivo
				P	Bosque protectorio
				T	Parque nacional
				T	Parque nacional marino
				P	Monumento natural
				T	Reserva científica
				P	Refugio de vida silvestre
				P	Parque natural
				P	Area recreativa
	1966	Ley General Forestal, Decreto-ley No. 39 [W]	Dirección Nacional de Desarrollo Forestal	T	Bosque especial (includes national parks and other protected areas)
	Various	Individual decrees [A]	Instituto Indígena Nacional de Antropología in cooperation with the respective indigenous tribes	L	Reserva indígena
	?	Legislation unknown [A]	?	P	Parque municipal

Table 11.2 Extent of notified natural forests, classified by forest function. Units are in sq. km, followed by % total area. Full data, with sources, are given in Annex 11.2.

Country SUBREGION	Total Area	F O R E S T F U N C T I O N			T o t a l
		Production	Protection	Conservation	
Belize	22,960	5,790 (25.2)	?	?	5,790 (25.2)
Costa Rica	51,100	?	4,632 (9.1)	?	4,632 (9.1)
El Salvador	21,040	?	?	?	?
Guatemala	108,890	?	7,763 (7.2)	?	7,763 (7.2)
Honduras	112,090	16,453 (14.7)	?	?	16,453 (14.7)
Mexico	1,958,200	70,115 (3.6)	712,452 (36.3)	?	782,567 (39.9)
Nicaragua	130,000	16,051 (12.3)	?	?	16,051 (12.3)
Panama	77,080	12,000 (15.6)	6,827 (8.9)	?	18,827 (24.4)
CENTRAL AMERICA AND MEXICO					
	2,481,360	120,409 (4.8)	731,674 (29.5%)	?	852,083 (34.3)

NB The above totals and subtotals are inaccurate because only incomplete data are available.

Table 11.3 Extent of notified and proposed conservation areas, classified by sector and national designation. Management categories are assigned to designations based on national legislation (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses). Totals for proposed sites may include areas of properties already protected but proposed for upgrading to higher conservation status. Details of individual properties are given in Annex 2. N is the total number of conservation areas.

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
BELIZE (22,960 sq. km)					
Forest Sector					
National Park	T	6	112,935	1	1,600
Nature Reserve	T	4	51,913	2	6,300
Wildlife Sanctuary	T	2	42,942	0	0
Subtotals		12	207,790	3	7,900
(% total area)			(9.1)		(0.4)
Additional Sector, or sector unknown					
Archaeological Reserve	P	1	20,000	1	800
Bird Sanctuary	T	9	9 *	0	0
Subtotals		10	20,009 *	1	800
(% total area)			(0.9)		(0.0)
Totals		22	227,799 *	4	8,700
(% total area)			(10.0)		(0.4)
COSTA RICA (51,100 sq. km)					
Forest Sector					
Forest Reserve	P	9	303,385	0	0
National Forest	P	1	900	0	0
Protection Zone	P	28	158,873 *	0	0
Wildlife Refuge	P	9	125,683	0	0
Subtotals		47	588,841 *	0	0
(% total area)			(11.5)		(0.0)
Wildlife Sector					
Biological Reserve	T	9	29,582	0	0
National Monument	T	1	217	0	0
National Park	T	18	479,397	0	0
Subtotals		28	509,196	0	0
(% total area)			(10.0)		(0.0)
Additional Sector, or sector unknown					
Anthropological Reserve	P	33	576,682	0	0
Subtotals		33	576,682	0	0
(% total area)			(11.3)		(0.0)
Totals		108	1,674,719 *	0	0
(% total area)			(32.8)		(0.0)
EL SALVADOR (21,040 sq. km)					
Forest Sector					
Protection Zone	P	0	0	1	1,403
Subtotals		0	0	1	1,403
(% total area)			(0.0)		(0.1)

COUNTRY Sector	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
National designation					
Wildlife Sector					
Biological Reserve	T	0	0	8	5,617
National Park	T	3	15,993	2	2,376
Natural Monument	P	0	0	2	2,841
Other area	P	0	0	2	1,200
Wildlife Refuge	P	3	4,132	0	0
Subtotals		6	20,125	14	12,034
(% total area)			(1.0)		(0.6)
Additional Sector, or sector unknown					
Municipal Park	P	0	0	1	1,000
Subtotals		0	0	1	1,000
(% total area)			(0.0)		(0.0)
Totals		6	20,125	16	14,437
(% total area)			(1.0)		(0.7)
GUATEMALA (108,890 sq. km)					
Forest Sector					
Forest Reserve	P	5	776,324	0	0
Subtotals		5	776,324	0	0
(% total area)			(7.1)		(0.0)
Wildlife Sector					
Biosphere Reserve (National)	P	0	0	1	17,500
Biotope	T	6	54,141	2	85,000
Cultural Monument	T	8	9,508	1	600
Faunal Reserve	P	0	0	2	51,700
National Park	T	28	839,489 *	3	24,900
Natural Monument	T	0	0	2	17,450
Nature Reserve	T	0	0	1	6,000
Wildlife Refuge	P	0	0	1	10,000
Subtotals		42	903,138 *	13	213,150
(% total area)			(8.3)		(2.1)
Additional Sector, or sector unknown					
Private Reserve	T	3	125 *	0	0
Subtotals		3	125 *	0	0
(% total area)			(0.0)		(0.0)
Totals		50	1,679,587 *	13	213,150
(% total area)			(15.4)		(2.1)
HONDURAS (112,090 sq. km)					
Forest Sector					
Biological Reserve	T	13	79,915	0	0
Cultural Monument	T	1	300	0	0
Forest Reserve	P	0	0	1	40,000
Marine National Park	T	0	0	1	3,500
National Park	T	13	354,666	4	201,600
Natural Monument	T	1	20	0	0
Other area	P	0	0	6	158,500
Protected Area	P	1	1,253	0	0
Wildlife Refuge	P	9	60,393	1	3,900
Subtotals		38	496,547	13	407,500
(% total area)			(4.4)		(3.6)
Totals		38	496,547	13	407,500
(% total area)			(4.4)		(3.6)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
MEXICO (1,958,200 sq. km)					
Forest Sector					
Experimental Forest	P	6	13,451	0	0
Forest Park	P	1	327	0	0
Forest Reserve	P	16	2,400,359	0	0
Protection Forest Zone	P	223	68,770,365	0	0
Reforestation Zone	P	6	60,706 *	0	0
Subtotals		252	71,245,208 *	0	0
(% total area)			(36.3)		(0.0)
Wildlife Sector					
Biosphere Reserve (National)	P	11	5,514,032	1	290,937
Ecological Reserve	P	0	0	11	236,164*
Faunal Reserve	P	2	1,000 *	1	1,180,400
Marine Reserve	P	4	67,318 *	0	0
National Monument	T	0	0	1	10
National Park	T	52	771,025	0	0
Natural Monument	T	1	6,045	0	0
Natural and Typical Biotope	P	1	30,000	0	0
Park	T	1	3,600	8	523,597
Protection Area for Wild Flora	P	1	37,302	0	0
Refuge	P	6	3,585,261 *	1	31,700
Reserve Zone for Migratory	T	1	0 *	0	0
Reserve Zone for Sea Turtle	T	16	1,744	0	0
Special Biosphere Reserve	P	15	531,273 *	0	0
Subtotals		111	10,548,600 *	23	2,262,808*
(% total area)			(5.3)		(1.1)
Additional Sector, or sector unknown					
Cetacean Sanctuary	P	1	40,000	0	0
Marine Refuge	P	1	0 *	0	0
Subtotals		2	40,000 *	0	0
(% total area)			(0.0)		(0.0)
Totals		365	81,833,808 *	23	2,262,808*
(% total area)			(41.6)		(1.1)
NICARAGUA (130,000 sq. km)					
Wildlife Sector					
Biological Reserve	P	2	797,654	0	0
National Natural Reserve	P	23	186,642	4	82,500
National Natural Resource	P	1	800,000	0	0
National Park	T	3	27,300	0	0
Wildland Area	P	5	8,500 *	8	43,600
Wildlife Refuge	P	3	16,300	1	128,700
Subtotals		37	1,836,396 *	13	254,800
(% total area)			(14.1)		(1.9)
Totals		37	1,836,396 *	13	254,800
(% total area)			(14.1)		(1.9)
PANAMA (77,080 sq. km)					
Forest Sector					
Forest Reserve	P	5	212,650	0	0
Protection Forest	P	2	455,000	3	118,000
Water Production Reserve	P	1	15,000	0	0
Subtotals		8	682,650	3	118,000
(% total area)			(8.9)		(1.5)

COUNTRY Sector	Man. Cat.	Notified		Proposed	
		N	Area (ha)	N	Area (ha)
National designation					
Wildlife Sector					
Biological Reserve	P	0	0	1	15,000
National Marine Park	T	1	13,226	0	0
National Park	T	11	1,301,323 *	1	10,200
National Reserve	T	1	0 *	0	0
Natural Monument	T	1	5,400	0	0
Natural Park	P	1	265	0	0
Recreation Area	P	1	348	0	0
Scientific Reserve	T	1	1,433	0	0
Wildlife Refuge	P	4	3,087	0	0
Subtotals		21	1,325,082 *	2	25,200
(% total area)			(17.2)		(0.3)
Additional Sector, or sector unknown					
Indigenous Reserve	P	2	752,600	4	226,000*
Municipal Park	P	1	45	0	0
Subtotals		3	752,645	4	226,000*
(% total area)			(9.8)		(2.9)
Totals		32	2,760,377 *	9	369,200*
(% total area)			(35.9)		(4.7)

CENTRAL AMERICA AND MEXICO (2,481,360 sq. km) - summary by sector

Forestry Sector	362	73,997,360 *	20	534,803
(% total area)		(29.8)		(0.2)
Wildlife Sector	245	15,142,537 *	65	2,767,992*
(% total area)		(6.1)		(1.1)
Additional Sector or sector unknown	51	1,389,461 *	6	227,800*
(% total area)		(0.6)		(0.1)

CENTRAL AMERICA AND MEXICO (2,481,360 sq. km) - summary by management category

Total protection	214	4,202,248 *	37	888,750
(% total area)		(1.7)		(0.4)
Partial protection	444	86,327,110 *	54	2,641,845*
(% total area)		(34.8)		(1.1)
Degree of protection unknown	0	0	0	0
(% total area)		(0.0)		(0.0)
Totals	658	90,529,358 *	91	3,530,595*
(% total area)		(36.5)		(1.4)

* Subtotal is incomplete because of missing data for either number of sites or area covered.

Table 11.4(a) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

			N	Mean size (ha)	Number in each size class (ha)			
					≤1000	1001- 10,000	10001- 100,000	>100,00
a) Forestry Sector								
BELIZE								
Notified sites	T	12	17,315	4	5	2	1	
	Total	12	17,315	4	5	2	1	
Proposed sites	T	3	2,633	0	3	0	0	
	Total	3	2,633	0	3	0	0	
COSTA RICA								
Notified sites	P	46	12,800	14	19	13	0	
	Total	46	12,800	14	19	13	0	
EL SALVADOR								
Proposed sites	P	1	1,403	0	1	0	0	
	Total	1	1,403	0	1	0	0	
GUATEMALA								
Notified sites	P	5	155,264	0	1	3	1	
	Total	5	155,264	0	1	3	1	
HONDURAS								
Notified sites	T	28	15,532	4	10	13	1	
	P	10	6,164	0	10	0	0	
	Total	38	13,067	4	20	13	1	
Proposed sites	T	5	41,020	1	2	1	1	
	P	8	25,300	1	3	4	0	
	Total	13	31,346	2	5	5	1	
MEXICO								
Notified sites	P	27	91,660	6	7	9	5	
	Total	27	91,660	6	7	9	5	
PANAMA								
Notified sites	P	8	85,331	0	2	3	3	
	Total	8	85,331	0	2	3	3	
Proposed sites	P	3	39,333	0	1	2	0	
	Total	3	39,333	0	1	2	0	
CENTRAL AMERICA AND MEXICO								
Notified sites	T	40	16,067	8	15	15	2	
	P	96	47,753	20	39	28	9	
	Total	136	38,433	28	54	43	1	
Proposed sites	T	8	26,625	1	5	1	1	
	P	12	26,816	1	5	6	0	
	Total	20	26,740	2	10	7	1	

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individ sites may be unknown. Countries for which there are no relevant data are not included in the table.

Table 11.4(b) Frequency distributions of notified and proposed conservation area sizes, with mea classified by management category (P = partial protection with local, sustainable extract uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,00
b) Wildlife Sector							
COSTA RICA							
Notified sites	T	28	18,185	6	12	9	1
	Total	28	18,185	6	12	9	1
EL SALVADOR							
Notified sites	T	3	5,331	0	3	0	0
	P	3	1,377	1	2	0	0
	Total	6	3,354	1	5	0	0
Proposed sites	T	10	799	6	4	0	0
	P	4	1,010	3	1	0	0
	Total	14	859	9	5	0	0
GUATEMALA							
Notified sites	T	40	22,578	20	14	3	3
	Total	40	22,578	20	14	3	3
Proposed sites	T	9	14,883	1	4	4	0
	P	4	19,800	0	1	3	0
	Total	13	16,396	1	5	7	0
MEXICO							
Notified sites	T	70	11,177	35	18	16	1
	P	35	279,033	4	3	16	1
	Total	105	100,462	39	21	32	1
Proposed sites	T	9	58,178	2	5	1	1
	P	13	133,784	0	6	5	2
	Total	22	102,854	2	11	6	3
NICARAGUA							
Notified sites	T	3	9,100	0	2	1	0
	P	31	58,357	0	23	5	3
	Total	34	54,011	0	25	6	3
Proposed sites	P	13	19,600	2	6	4	1
	Total	13	19,600	2	6	4	1
PANAMA							
Notified sites	T	13	101,644	0	4	5	4
	P	6	616	5	1	0	0
	Total	19	69,741	5	5	5	4
Proposed sites	T	1	10,200	0	0	1	0
	P	1	15,000	0	0	1	0
	Total	2	12,600	0	0	2	0
CENTRAL AMERICA AND MEXICO							
Notified sites	T	157	22,671	61	53	34	9
	P	75	154,441	10	29	21	1
	Total	232	65,269	71	82	55	2

Proposed sites	T	29	23,301	9	13	6	1
	P	35	59,778	5	14	13	3
	Total	64	43,249	14	27	19	4

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 11.4(c) Frequency distributions of notified and proposed conservation area sizes, with mea classified by management category (P = partial protection with local, sustainable extract uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

c) Additional Sector(s)		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
BELIZE							
Notified sites	T	8	1	8	0	0	0
	P	1	20,000	0	0	1	0
	Total	9	2,223	8	0	1	0
Proposed sites	P	1	800	1	0	0	0
	Total	1	800	1	0	0	0
	COSTA RICA						
Notified sites	P	33	17,475	1	15	17	0
	Total	33	17,475	1	15	17	0
	EL SALVADOR						
Proposed sites	P	1	1,000	1	0	0	0
	Total	1	1,000	1	0	0	0
	GUATEMALA						
Notified sites	T	2	62	2	0	0	0
	Total	2	62	2	0	0	0
	MEXICO						
Notified sites	P	1	40,000	0	0	1	0
	Total	1	40,000	0	0	1	0
	PANAMA						
Notified sites	P	3	250,881	1	0	0	2
	Total	3	250,881	1	0	0	2
	Proposed sites	P	3	75,333	0	0	2
Total		3	75,333	0	0	2	1
CENTRAL AMERICA AND MEXICO							
Notified sites	T	10	13	10	0	0	0
	P	38	36,561	2	15	19	2
	Total	48	28,947	12	15	19	2
Proposed sites	P	5	45,560	2	0	2	1
	Total	5	45,560	2	0	2	1

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 11.5 State parties to international (and regional) conventions or programmes concerning the conservation of natural areas, together with the number of properties (natural or mix natural/cultural in the case of the World Heritage Convention) recognised under respect conventions in brackets.

	World Heritage Convention	Biosphere Reserves¹	Ramsar Convention
Belize	1990 (0)	-	-
Costa Rica	1977 (1)	1982 (2)	1992 (2)
El Salvador	1991 (0)	-	-
Guatemala	1979 (1)	-	1990 (1)
Honduras	1979 (1)	1980 (1)	-
Mexico	1984 (1)	1977 (6)	1986 (1)
Nicaragua	1979 (0)	-	-
Panama	1978 (2)	1977 (1)	1990 (1)

¹Unesco MAB Project 8

Table 11.6 Summary of national priorities for action relating to conservation areas.

COUNTRY	Legislation	Completing the network	Managing the network
Belize		Increase number of conservation areas	Establish conservation division within Forest Department
Costa Rica	Enact proposed legislation	Restructure and consolidate entire network	Increase coordination between institutions; re-organize National Parks Service; increase involvement of local people in management
El Salvador	Approve legislation proposed in 1980. Legally establish areas already identified as priority sites	Increase number of conservation areas by incorporating into network areas previously identified for protection	Increase cooperation between government and NGOs
Guatemala		Incorporate into network areas already identified as priority sites	Increase cooperation between institutions via Consejo Nacional de Areas Protegidas
Honduras	Enact proposed legislation Formulate new legislation for administrative re-structuring	Review network and increase number of conservation areas	Revoke creation of Dirección General de Recursos Forestales y Vida Silvestre and formally amalgamate all responsibilities into Corporación Hondureña de Desarrollo Forestal. Restructure Corporación Hondureña de Desarrollo Forestal
Mexico			Insufficient information
Nicaragua	Designate categories and legally establish areas identified as priority sites	Incorporate into network areas already identified for protection	Develop management plans for existing conservation areas
Panama	Formulate new legislation	Consolidate system	Increase cooperation between government and NGOs and indigenous communities

Annex 11.1 List of conservation areas. Locations of most notified conservation areas are shown in the accompanying maps in Part III

BELIZE

Archaeological Reserve			
1 Caracol		20,000	
Subtotal	1 site	20,000 ha	
Bird Sanctuaries			
2 Bird Cay		1	1977
3 Doubloon Bank Cay		1	1977
4 Little Guana Cay		2	1977
5 Man-o-war Cay		1	1977
6 Small Mangrove Cay		1	1977
7 Southwest Cay			
8 Unnamed Cay (I)		1	1977
9 Unnamed Cay (II)		1	1977
10 Unnamed Cay (III)		1	1977
Subtotal	9 sites	9 ha*	
National Parks			
11 Blue Hole		233	1984
12 Chiquibul		107,607	1991
13 Fives Blues Lakes		358	1990
14 Guanacaste Park		21	1973
15 Half Moon Caye		4,144	1982
16 Laughing Bird Caye		572	1991
Subtotal	6 sites	112,935 ha	
Nature Reserves			
17 Bladen Branch		39,256	1990
18 Hol Chan Marine		1,295	1987
19 Rio Grande		2,340	1968
20 Shipstern		9,022	1987
Subtotal	4 sites	51,913 ha	
Wildlife Sanctuaries			
21 Cockscomb Basin		41,472	1986
22 Crooked Tree		1,470	1984
Subtotal	2 sites	42,942 ha	
Proposed (Archaeological Reserve)			
Xunantunich		800	
Subtotal	1 site	800 ha	
Proposed (National Park)			
Upper Bladen		1,600	
Subtotal	1 site	1,600 ha	
Proposed (Nature Reserves)			
Union Camp/Little Quartz Ridge		1,300	
Upper Guacamallo River/Macal River		5,000	
Subtotal	2 sites	6,300 ha	
Totals			
Existing conservation areas	22 sites	227,799 ha*	
Proposed conservation areas	4 sites	8,700 ha	

* Subtotal is incomplete because of missing data.

COSTA RICA

Anthropological Reserves

1 Abrojos	1,480	1978
2 Alto Chirripo	77,973	1976
3 Alto Pacuare	1,336	
4 Awari	1,332	
5 Bajo Chirripo	18,783	1976
6 Barbilla	2,077	1982
7 Boruca	12,470	1956
8 Boruca-Terraba	31,983	1957
9 Cabagra	27,860	1956
10 China Kicha	2,459	
11 Chirripo	75,824	1976
12 Cocles	3,538	
13 Conte Burica	11,910	1977
14 Corina	1,555	
15 Coto Brus	7,500	1976
16 Guatuso	2,743	1976
17 La Estrella	13,616	
18 Matambu	1,710	1976
19 Nimari Bukiri	7,439	
20 Osa	1,700	1985
21 Oso Molejones	525	
22 Rey Curre	10,620	1985
23 Salitre	11,700	1956
24 Sibuju Norte	2,195	
25 Talamanca - Bribri	43,690	1976
26 Talamanca - Cabecar	22,729	1976
27 Talamanca	62,253	1976
28 Tayni	13,616	1976
29 Telire	16,260	1976
30 Terraba	9,350	1956
31 Ujarras Salitre-Cabagra	56,561	1957
32 Ujarras	19,040	1956
33 Zapaton	2,855	1981
Subtotal	33 sites	576,682 ha

Biological Reserves

34 Cabo Blanco	1,172	1963
35 Carara	4,700	1978
36 Hitoy-Cerere	9,154	1978
37 Isla Parajos	4	1973
38 Isla del Cano	200	1978
39 Islas Guayabo y Negritos	143	1973
40 La Selva	1,430	1968
41 Lomas Barbudal	2,279	1986
42 Monteverde Cloud Forest	10,500	1972
Subtotal	9 sites	29,582 ha

Forest Reserves

43 Cordillera Volcanica Central	61,542	1975
44 Golfo Dulce	67,287	1978
45 Grecia	2,000	1973
46 Los Santos	62,000	1975
47 Manglares del Pais	35,000	1977
48 Matina	400	1973
49 Rio Macho	69,604	1964
50 Taboga	296	1978
51 Volcan Arenal	5,256	1969
Subtotal	9 sites	303,385 ha

National Forest

52 Diria	900	1991
Subtotal	1 site	900 ha

National Monument

53 Guayabo Archaeological Site		217	1973
Subtotal	1 site	217 ha	
National Parks			
54 Arenal		2,000	1991
55 Ballena Marine		4,200	1990
56 Barra Honda		2,295	1974
57 Braulio Carrillo		44,099	1978
58 Cahuita		1,067	1970
59 Chirripo		50,150	1975
60 Corcovado		54,568	1975
61 Guanacaste		32,512	1991
62 Isla del Coco Marine		2,400	1978
63 La Amistad (Talamanca)		193,929	1982
64 Las Baulas de Guanacaste		112	1991
65 Manuel Antonio		682	1972
66 Palo Verde		13,228	1982
67 Rinco del Viejo Volcan		14,083	1973
68 Santa Rosa		37,217	1971
69 Tortuguero		18,946	1975
70 Volcan Irazu		2,309	1955
71 Volcan Poas		5,600	1971
Subtotal	18 sites	479,397 ha	
Protection Zones			
72 Acuiferos de Guacimo Pococi		4,270	1987
73 Arenal		18,325	1991
74 Barbilla		12	1982
75 Cabecar			1976
76 Caraigres		4,000	1976
77 Cerro Atenas		900	1976
78 Cerro Nara		3	1984
79 Cerros Escazu		7,060	1976
80 Cerros de La Carpintera		2,000	1976
81 Cerros de Turrubares		2,340	1983
82 Cuenca Rio Tuis		4,095	1986
83 El Chayote		847	1984
84 El Rodeo		2,222	1976
85 Juan Castro Blanco		14,258	1968
86 La Cangreja		1,937	1984
87 La Selva		2,815	1982
88 Las Baulas de Guanacaste		9	1991
89 Las Tablas		19,602	1981
90 Miravelles		11,670	1991
91 Quitirrisi		40	1982
92 Rio Grande		1,500	1976
93 Rio Pacuare		13,060	1991
94 Rio Sombrero - Rio Navarro		6,440	1984
95 Rio Tiribi		650	1976
96 San Ramon		7,800	1991
97 Tenorio		17,650	1991
98 Tivives		2,368	1986
99 Tortuguero		13,000	1990
Subtotal	28 sites	158,873 ha*	
Wildlife Refuges			
100 Barra del Colorado		98,000	1985
101 Cano Negro		9,969	1983
102 Curu		75	1983
103 Gandoca y Manzanillo		9,449	1985
104 Golfito		1,350	1985
105 Isla Bolanos		100	1981
106 Ostional		160	1983
107 Tamarindo		500	1985
108 Tapanti		6,080	1982
Subtotal	9 sites	125,683 ha	

Totals		
Existing conservation areas	108 sites	1,674,719 ha*
Proposed conservation areas	0 sites	ha

* Subtotal is incomplete because of missing data.

EL SALVADOR

National Parks

1 Cerro Verde		6,500	1981
2 El Imposible		5,600	1983
3 Montecristo		3,893	1979
Subtotal	3 sites	15,993	ha

Wildlife Refuges

4 Barra de Santiago		2,200	1983
5 Deininger		732	1973
6 El Jocotal		1,200	1978
Subtotal	3 sites	4,132	ha

Proposed (Biological Reserves)

Colima		676	1983
Escuintla		833	1983
Normandia		323	1983
Parras Lempa		21	1983
San Carlos		342	1983
San Diego		2,213	1983
Tierra Blanco		8	1983
Volcan San Miguel		1,201	
Subtotal	8 sites	5,617	ha

Proposed (Municipal Park)

Los Cobanos		1,000	
Subtotal	1 site	1,000	ha

Proposed (National Parks)

Nancuchiname		1,175	1983
Volcan de Conchagua		1,201	1983
Subtotal	2 sites	2,376	ha

Proposed (Natural Monuments)

Lavas de San Marcelino		2,170	1983
Santa Clara		671	1983
Subtotal	2 sites	2,841	ha

Proposed (Other areas)

Los Andes		800	
San Andres		400	
Subtotal	2 sites	1,200	ha

Proposed (Protection Zone)

Lavas de Quezaltepeque (Picacho-Boqueron)		1,403	1983
Subtotal	1 site	1,403	ha

Totals

Existing conservation areas	6 sites	20,125	ha
Proposed conservation areas	16 sites	14,437	ha

GUATEMALA

Biotopes

1 Cerro Cahui	750	1981
2 Chocon-Machacas	6,265	1981
3 Mario Dary Rivera Quetzal	1,173	1976
4 Monterrico	2,800	1977
5 San Miguel - El Zotz	42,000	1989
6 University Biotope for Conservation of Quetzal	1,153	1977
Subtotal	6 sites	54,141 ha

Cultural Monuments

7 Aguatecal, 709		1987
8 Ceibal	2,100	1984
9 Dos Pilas	3,166	1987
10 Ixcun	400	1979
11 Ixmiche	50	1974
12 Machaquilla	2,000	1974
13 Naj - Tunich	49	1974
14 Quirigua	34	1979
Subtotal	8 sites	9,508 ha

Forest Reserves

15 Area de Uso Multiple R.B.M.	650,000	1990
16 Area de Uso Multiple R.S.M.	34,000	1990
17 Franja Transversal del Norte	1,200	1981
18 Rio Chixoy	28,000	1980
19 Rio Salama	63,124	1956
Subtotal	5 sites	776,324 ha

National Parks

20 Atitlan	54,773	1955
21 Bahia de Santo Tomas (Recreation)	1,000	1956
22 Cerro Miramundo	902	1955
23 Cerro de Baul (Recreational)	240	1955
24 Cuevas de Silvino	8	1961
25 El Reformador	60	1955
26 El Rosario (Forest)	1,031	1980
27 El Tigre	350,000	1990
28 Grutas de Lanquin		1955
29 Hawaii	3	1988
30 Lacandon	200,000	1990
31 Laguna Lachua	10,000	1978
32 Laguna del Pino (Recreational)	73	1955
33 Las Victorias (Recreational)	82	1955
34 Los Aposentos	10	1955
35 Mirador/Dos Lagos/Rio Azul	147,000	1990
36 Naciones Unidas (Recreational)	92	1955
37 Rio Dulce	7,200	1955
38 Riscos de Momostenango		1955
39 Ruinas de Iximche (Cultural)	50	1963
40 San Jose la Colonia (Recreational)	89	1980
41 San Rafael Pixcaya	376	
42 Santa Rosalia	1,000	1956
43 Sipacate-Naranjo	2,000	1969
44 Tayasal	100	1982
45 Tikal	57,400	1957
46 Trifinio National Park	4,000	1987
47 Volcan de Pacaya	2,000	1963
Subtotal	28 sites	839,489 ha*

Private Reserves

48 Auto Safari Chapin Wildlife Park	80	
49 Chelem Ha Quetzal		1983
50 Finca Los Andes Quetzal	45	
Subtotal	3 sites	125 ha*

Proposed (Biosphere Reserve (National))		
Rio San Roman		17,500
Subtotal	1 site	17,500 ha
Proposed (Biotopes)		
Cerro San Gil		35,000
Punta de Manabique		50,000
Subtotal	2 sites	85,000 ha
Proposed (Cultural Monument)		
Ucanal		600
Subtotal	1 site	600 ha
Proposed (Faunal Reserves)		
Chuquibul		22,000
El Caribe		29,700
Subtotal	2 sites	51,700 ha
Proposed (National Parks)		
El Manchon		8,000
El Quetzal		1,900
Machaquila		15,000
Subtotal	3 sites	24,900 ha
Proposed (Natural Monuments)		
El Chorro		13,700
Rio Mopan		3,750
Subtotal	2 sites	17,450 ha
Proposed (Nature Reserve)		
Cerro Bisis		6,000
Subtotal	1 site	6,000 ha
Proposed (Wildlife Refuge)		
Tuspan - Agua Dulce		10,000
Subtotal	1 site	10,000 ha
Totals		
Existing conservation areas	50 sites	1,679,587 ha*
Proposed conservation areas	13 sites	213,150 ha

* Subtotal is incomplete because of missing data.

HONDURAS

Biological Reserves

1 El Chiflador	1,000	1987
2 El Chile	12,000	1987
3 El Pital	3,800	1987
4 Guajiquiro	7,000	1987
5 Guisayote	7,000	1987
6 Lancetilla	1,681	1987
7 Misaco	4,600	
8 Montecillos	12,500	1987
9 Opalaca	14,500	1987
10 Uyuca	234	1986
11 Volcan Pacayita	9,700	1987
12 Yerba Buena	3,600	1987
13 Yuscaran	2,300	1987
Subtotal	13 sites	79,915 ha

Cultural Monument

14 Ruinas de Copan	300	1980
Subtotal	1 site	300 ha

National Parks

15 Agalta	62,400	1987
16 Azul Meambar	20,000	1987
17 Celaque	27,000	1987
18 Cerro Azul	15,000	1987
19 Islas de la Bahia Marine	29,416	
20 La Tigra	7,550	1980
21 Montana de Comayagua	18,000	1987
22 Montana de Cusuco	18,000	1987
23 Montana de Yoro	15,000	1987
24 Pico Bonito	112,500	1987
25 Pico Pijol	11,400	1987
26 Santa Barbara	13,000	1987
27 Trifinio	5,400	1987
Subtotal	13 sites	354,666 ha

Natural Monument

28 Cuevas de Taulabe	20	
Subtotal	1 site	20 ha

Protected Area

29 Lancetilla Botanic Garden	1,253	1978
Subtotal	1 site	1,253 ha

Wildlife Refuges

30 Corralitos	5,500	1987
31 El Armado	3,500	1987
32 Erapuca	5,600	1987
33 La Muralla	6,093	1987
34 Mixcure	8,000	1987
35 Montana Verde	8,300	
36 Montana de Puca	4,900	1987
37 Rios de Cuero y Salado	8,500	1988
38 Texiguat	10,000	1987
Subtotal	9 sites	60,393 ha

Proposed (Forest Reserve)

Montanas de Colon	40,000	
Subtotal	1 site	40,000 ha

Proposed (Marine National Park)

Teca	3,500	
Subtotal	1 site	3,500 ha

Proposed (National Parks)		
Caratasca		120,000
Cayos Cochinos		300
Cayos Miskitos		80,000
Punta Sal		1,300
Subtotal	4 sites	201,600 ha
Proposed (Other areas)		
Barra Motagua		3,000
Cordillera Entre Rios		60,000
Guaimoreto		5,000
Punta Raton		500
Rio Cruta		50,000
Tahuanka		40,000
Subtotal	6 sites	158,500 ha
Proposed (Wildlife Refuge)		
Punta Condega		3,900
Subtotal	1 site	3,900 ha
Totals		
Existing conservation areas	38 sites	496,547 ha
Proposed conservation areas	13 sites	407,500 ha

MEXICO

Biosphere Reserves (National)

1 Calakmul	723,185	1989
2 Chimalpas	460,000	
3 El Cielo	130,000	
4 El Pinacate	480,956	
5 El Triunfo	119,177	1972
6 El Vizcaino	2,546,790	1988
7 Mapimi	20,000	1979
8 Michilia	35,000	1979
9 Montes Azules	331,200	1978
10 Sian Ka'an	528,147	1986
11 Sierra de Manantlan	139,577	1987
Subtotal	11 sites	5,514,032 ha

Cetacean Sanctuary

12 Isla de Guerrero Negro	40,000	1979
Subtotal	1 site	40,000 ha

Experimental Forests

13 Barranca de Cupatitzio	471	1962
14 El Tormento	1,400	1961
15 La Saucedá	1,000	1961
16 San Filipe Bacalar	8,000	1971
17 San Juan Tetla	1,580	1963
18 Todos Santos	1,000	1971
Subtotal	6 sites	13,451 ha

Faunal Reserves

19 El Garrafon		1980
20 Isla Cedros	1,000	1978
Subtotal	2 sites	1,000 ha*

Forest Park

21 Tereno Baldio al Norte de la Paz	327	1951
Subtotal	1 site	327 ha

Forest Reserves

22 Bavispe	198,164	1939
23 Campo Verde	78,792	1938
24 Centenario	3,000	1949
25 El Gavilan	9,682	1923
26 Mesa del Pitorreal	4,900	1923
27 Nevado de Toluca	800	1937
28 Papigochic	172,480	1939
29 Porcion Boscosa de San Luis Potosi	29,885	1923
30 San Jose de los Molinos	2,995	1942
31 Sierra de Juarez	140,000	1951
32 Sierra de Los Ajos, Buenos Aires y Purica	21,494	1936
33 Sierra de Pedro Martir	74,000	1951
34 Sierras de Hansen y Sn Pedro Martir, y Mesa Pinal	1,249,000	1923
35 Tequixquipan	32,000	1935
36 Terenos de Puebla y Mexico	18,215	1926
37 Tutuaca	364,952	1937
Subtotal	16 sites	2,400,359 ha

Marine Refuge

38 Costa Occidental de Isla Mujeres		1973
Subtotal	1 site	ha*

Marine Reserves

39 Cabo San Lucas		1973
40 Cozumel	450	1980
41 La Blanquilla	66,868	1975
42 Los Arcos		1975
Subtotal	4 sites	67,318 ha*

National Parks			
43	Balneario de los Novillos	56	1940
44	Barranca de Cupatitzio	452	1938
45	Benito Juarez	2,737	1937
46	Bosencheve	15,000	1940
47	Canon de Rio Blanco	55,900	1938
48	Canon del Sumidero	21,789	1980
49	Cascada de Bassaseachic	6,263	1981
50	Cerro de Garnica	968	1936
51	Cerro de la Estrella	1,100	1938
52	Cofre de Perote	11,700	1937
53	Constitucion de 1857	5,009	1962
54	Cumbres de Ajusco	920	1936
55	Cumbres de Majalca	4,772	1939
56	Cumbres de Monterrey	246,500	1939
57	Desierto de los Leones	1,529	1917
58	Desierto del Carmen	529	1942
59	Dzibilchaltun	539	1987
60	El Chico	2,739	1982
61	El Cimatario	2,447	1982
62	El Gogorron	25,000	1936
63	El Potosi	2,000	1936
64	El Rayon	34	1952
65	El Sabinall	8	1938
66	El Sacromonte	10	1939
67	El Tepeyac	294	1937
68	El Tepozteco	24,000	1937
69	El Veladero	3,159	1980
70	Grutas de Cacahuamilpa	1,600	1936
71	Insurgente Jose Maria Morelos y Pavon	4,324	1939
72	Insurgente Miguel Hidalgo y Costilla	1,760	1936
73	Isla Isabela	194	1980
74	Iztaccihuatl-Popocatepetl	25,679	1935
75	Juan N. Alvarez	528	1964
76	La Malinche	45,711	1938
77	Lago de Camecuaru	9	1941
78	Lagunas de Chacahua	14,187	1937
79	Lagunas de Montebello	6,022	1959
80	Lagunas de Zempoala	4,669	1936
81	Los Marmoles	23,150	1936
82	Los Remedios	400	1938
83	Molino de Flores	49	1937
84	Nevado de Colima	22,200	1936
85	Nevado de Toluca	51,000	1936
86	Palenque	1,772	1981
87	Pico de Orizaba	19,750	1937
88	Pico de Tancitaro	29,316	1940
89	Rayon	25	1952
90	Sacromonte	45	1939
91	Sierra de San Pedro Martir	63,000	1947
92	Tula	99	1981
93	Tulum	664	1981
94	Zoquiapan y Anexas	19,418	1937
	Subtotal	52 sites	771,025 ha
Natural Monument			
95	Cerro de la Silla	6,045	1991
	Subtotal	1 site	6,045 ha
Natural and Typical Biotope			
96	La Encrucijada	30,000	1972
	Subtotal	1 site	30,000 ha
Park			
97	Omitemi	3,600	
	Subtotal	1 site	3,600 ha

Protection Area for Wild Flora & Fauna			
98 Corredor Biologico Chichinautzin		37,302	1988
Subtotal	1 site	37,302	ha
Reforestation Zones			
99 Cerro del Vigia			1931
100 Cuenca Hidrografica del Rio la Carbonera		22,050	1936
101 Cuencas de las Barrancas			1933
102 Cumbres del Ajusco		25,485	1938
103 Montes de los Predios Huizapa-Sesecapa		12,944	1936
104 Predio de Tena		227	1937
Subtotal	6 sites	60,706	ha*
Refuges			
105 Janos y Ascencion			1937
106 La Mojonera		9,201	1981
107 La Primavera		30,500	1980
108 Sierra de Alvarez		16,900	1981
109 Sierra del Pinacate		28,660	1979
110 Valle de los Cirios		3,500,000	1980
Subtotal	6 sites	3,585,261	ha*
Reserve Zone for Migratory Fauna			
111 Laguna Ojo de Liebre y San Ignacio			1972
Subtotal	1 site		ha*
Reserve Zones for Sea Turtle Protection			
112 Playa Ceuta		175	1986
113 Playa Cuitzmala		30	1986
114 Playa El Tecuan		35	1986
115 Playa El Verde Camacho		150	1986
116 Playa Mexiquillo		63	1986
117 Playa Mismaloya		345	1986
118 Playa Piedra de Tlacoyunque		60	1986
119 Playa Teopa		30	1986
120 Playa adyacente a Rio Lagartos		210	1986
121 Playa de Escobilla		75	1986
122 Playa de Isla Contoy		48	1986
123 Playa de Maruata y Colola		63	1986
124 Playa de Puerto Arista		150	1986
125 Playa de Rancho Nuevo		88	1986
126 Playa de Tierra Colorada		135	1986
127 Playa de la Bahia de Chacahua		87	1986
Subtotal	16 sites	1,744	ha
Special Biosphere Reserves			
128 Cajon del Diablo			1937
129 Cascadas de Agua Azul		2,580	1980
130 El Ocote		48,140	1982
131 Isla Contoy		176	1961
132 Isla Guadalupe		25,000	1922
133 Isla Rasa		7	1964
134 Isla Tiburon		120,800	1963
135 Islas del Golfo de California		150,000	1978
136 Mariposa Monarca		16,100	1980
137 Ria Celestun		59,130	1979
138 Ria Lagartos		47,840	1979
139 Sierra de la Laguna		20,000	
140 Sierra de Manantlan (Veracruz)		20,000	
141 Sierra de Santa Martha		20,000	1980
142 Volcan de San Martin		1,500	1979
Subtotal	15 sites	531,273	ha*
Proposed (Biosphere Reserve (National))			
Pantanos de Centla		290,937	
Subtotal	1 site	290,937	ha

Proposed (Ecological Reserves)		
Cerro Pelado		4,500
Cuatro Cienegas		12,000
Huayacocotla		3,600
La Encrucijada		30,000
Laguna de Chashchoc		4,202
Serrania de Poana		3,512
Sierra Fria		90,000
Sierra de Juarez		2,250
Sierra de Ontotepec		5,100
Sierra del Diablo		81,000
Teotepec		
Subtotal	11 sites	236,164 ha*
Proposed (Faunal Reserve)		
Sebastian Vizcaino		1,180,400
Subtotal	1 site	1,180,400 ha
Proposed (National Monument)		
Gruta y Cerro de Cocona		10
Subtotal	1 site	10 ha
Proposed (Parks)		
Canon del Rio Usumacinta		9,420
Conurbacion de la Laguna		460,000
El Tecuan		858
Lagunas de Mecoacan y Rio Gonzalez		38,493
Serrania de Madrigal		5,300
Serrania de Tapijulapa		6,685
Sierra de Agua Blanca		1,441
Sierra de Organos		1,400
Subtotal	8 sites	523,597 ha
Proposed (Refuge)		
Dzilam de Bravo		31,700
Subtotal	1 site	31,700 ha
Totals		
Existing conservation areas	142 sites	13,063,443 ha*
Proposed conservation areas	23 sites	2,262,808 ha*

* Subtotal is incomplete because of missing data.

NICARAGUA

Biological Reserves

1 Cayos Miskitos (Marine)		502,654	1991
2 Rio Indio Maiz		295,000	1990
Subtotal	2 sites	797,654	ha

National Natural Reserves

3 Alamikamba		2,100	1991
4 Archipielago de Solentiname		8,500	1990
5 Castillo de la Inmaculada		1,500	1990
6 Cerro Bana Cruz		19,700	1991
7 Cerro Cumaica		5,000	1991
8 Cerro Kuskawa		4,760	1991
9 Cerro el Diablo		10,128	1991
10 Cordillera Maribios		34,460	1983
11 Estero Real		38,725	1976
12 Isla Juan Venado		4,500	
13 Isla de Ometepe		3,700	
14 Laguna Mecatepe		1,050	
15 Laguna de Apoyo		2,100	
16 Laguna de Tisma		7,000	1983
17 Makantaka		2,000	1991
18 Padre Ramos		4,826	1990
19 Peninsula Chiltepe		1,800	1983
20 Volcan Concepcion		2,200	
21 Volcan Cosiguina		12,420	1976
22 Volcan Maderas		4,000	1983
23 Volcan Mombacho		2,847	1983
24 Volcan Momotombe y Momotombito		8,500	1983
25 Yucul		4,826	1990
Subtotal	23 sites	186,642	ha

National Natural Resource Reserve

26 Bosawas		800,000	1991
Subtotal	1 site	800,000	ha

National Parks

27 Archipielago Zapatera		10,000	1983
28 Saslaya		11,800	1971
29 Volcan Masaya		5,500	1978
Subtotal	3 sites	27,300	ha

Wildland Areas

30 Cerro Musun			1983
31 Macizos de Penas Blancas		7,000	1976
32 Peninsula Cosiguina			1958
33 Peninsula de Costa Sur del Pacifico			1983
34 Pinares de Dipilto		1,500	1983
Subtotal	5 sites	8,500	ha*

Wildlife Refuges

35 La Flor		1,500	1983
36 Los Guatusos		10,000	1990
37 Rio Escalante-Chacocente		4,800	1983
Subtotal	3 sites	16,300	ha

Proposed (National Natural Reserves)

Lagunas Bismunat-Raya		16,300	
Lagunas Wankarlaya		23,000	
Lagunas de Tecomapa, Moyua y Las Playitas		1,500	
Rio Grande de Matagalpa		41,700	
Subtotal	4 sites	82,500	ha

Proposed (Wildland Areas)

Cerro Kilambe		6,000	
Cerro Tomabu		2,000	

Cerro Waylawas		1,200
Cordillera de Amerisque		2,000
Laguna Wounta		30,000
Salta del Rio Estanzuela		200
Salta del Rio Yasica		200
Santa Maria de Ostuma		2,000
Subtotal	8 sites	43,600 ha
Proposed (Wildlife Refuge)		
San Juan Delta		128,700
Subtotal	1 site	128,700 ha
Totals		
Existing conservation areas	37 sites	1,836,396 ha*
Proposed conservation areas	13 sites	254,800 ha

* Subtotal is incomplete because of missing data.

PANAMA

Forest Reserves

1 Canglon	31,650	1984
2 Chepigana	146,000	1960
3 La Tronosa	22,000	1977
4 La Yeguada	3,000	1960
5 Montuoso	10,000	1978
Subtotal	5 sites	212,650 ha

Indigenous Reserves

6 Comarca Kuna Yala (San Blas)	320,000	1938
7 Emberé-Wounan (Ember-Orua)	432,600	1983
Subtotal	2 sites	752,600 ha

Municipal Park

8 Summit	45	1945
Subtotal	1 site	45 ha

National Marine Park

9 Isla Bastimentos	13,226	1988
Subtotal	1 site	13,226 ha

National Parks

10 Altos de Campana	4,816	1977
11 Cerro Hoya	32,557	1984
12 Chagres	129,000	1984
13 Coiba	270,000	1991
14 Darien	579,000	1980
15 El Cope		1986
16 La Amistad IP	207,000	1988
17 Portobelo	34,846	1976
18 Sarigua	8,000	1984
19 Soberania	22,104	1980
20 Volcan Baru	14,000	1976
Subtotal	11 sites	1,301,323 ha*

National Reserve

21 Las Hoyas de Rio Indio		1963
Subtotal	1 site	ha*

Natural Monument

22 Barro Colorado	5,400	1977
Subtotal	1 site	5,400 ha

Natural Park

23 Metropolitano	265	1985
Subtotal	1 site	265 ha

Protection Forests

24 Alto de Darien	211,000	1972
25 Palo Seco	244,000	1983
Subtotal	2 sites	455,000 ha

Recreation Area

26 Lago Gatun	348	1985
Subtotal	1 site	348 ha

Scientific Reserve

27 Isla Maje	1,433	1977
Subtotal	1 site	1,433 ha

Water Production Reserve

28 La Fortuna	15,000	1976
Subtotal	1 site	15,000 ha

Wildlife Refuges			
29 Cienega del Mangle		776	1980
30 Isla Iguana		53	1981
31 Islas Taboga y Uraba		258	1984
32 Penon de la Onda		2,000	1984
Subtotal	4 sites	3,087	ha
Proposed (Biological Reserve)			
Isla Cana		15,000	
Subtotal	1 site	15,000	ha
Proposed (Indigenous Reserves)			
Bayano		87,000	
Chiriqui Tabasara		125,000	
Chunaque		14,000	
Comarca Tabasara			
Subtotal	4 sites	226,000	ha*
Proposed (National Park)			
Islas de las Perlas		10,200	
Subtotal	1 site	10,200	ha
Proposed (Protection Forests)			
Cuenca Alta del Rio Pacora		8,000	
Filo del Tallo		28,000	
Serrania del Maje		82,000	
Subtotal	3 sites	118,000	ha
Totals			
Existing conservation areas	32 sites	2,760,377	ha*
Proposed conservation areas	9 sites	369,200	ha*

* Subtotal is incomplete because of missing data.

ANNEX 11.2 Extent of notified forests by forest origin and forest function. Non-forest includes both degraded forest and lands not forested at the time of their reservation.

Region: Tropical Latin America Sub-region: Central America and Mexico

Name of country/state: Belize

Total area (sq.km): 22960

Land area (sq.km):

Month/year of reference: December 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	579020					
Non-forest						
Plantation						
TOTAL	579020	0	0	0	0	0

Notes: The area given for production forests is the total area covered by the 15 designated forest reserves all of which have been or are in the process of being logged.

Forest reserves are described in the legislation as having both protective and exploitative functions. However, as no figure is available for the extent of land within the forest reserves that is managed for protection purposes, the total area must be considered to correspond to production forest.

The forestry sector in Belize is responsible for managing all conservation areas in the country including national parks and reserves. These have not been included in the above table however as they do not constitute legally designated forest areas per.se.

ANNEX 11.2 (continued)

Region: Tropical Latin AmericaSub-region: Central America and Mexico

Name of country/state: Costa Rica

Total area (sq.km): 51100

Land area (sq.km): 51060

Month/year of reference: June 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural			463158			
Non-forest						
Plantation						
TOTAL	0	0	463158	0	0	0

Notes: Protection forest comprises 9 forest reserves covering 303,385 ha; 1 national forest covering 900 ha; and 28 protection zones covering 158,873 ha. (Ugalde, in litt, 1992).

Current forestry legislation also provides for the protection of forested areas 200m wide along the lengths of coasts and 500m wide on either side of rivers. National figures for the extent of land meeting this criteria are not available.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub-region: Central America and Mexico

Name of country/state: El Salvador

Total area (sq.km): 21040

Land area (sq.km): 20720

Month/year of reference:

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: Although current legislation provides for the creation of forest reserves and protective zones, no information is available to indicate whether any such areas have been established or not.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub-region: Central America and Mexico

Name of country/state: Guatemala

Total area (sq.km): 108890

Land area (sq.km): 108430

Month/year of reference:

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural			776324			
Non-forest						
Plantation						
TOTAL	0	0	776324	0	0	0

Notes: There are a number of different agencies responsible for protected areas; their activities are coordinated by CONAP. This includes the activities of the National Forestry Institute DIGEBOS, which is responsible for production forest, but figures are currently not available (Detlefsen et al., 1991).

Protection forest comprises 5 forest reserves, which includes 2 multiple use forest reserves (Godoy, in litt, 1992).

In 1989, 44 special protection areas were declared under a new law but boundaries have not yet been specified. It remains unclear what proportions of these areas will be allocated for protection, conservation or sustainable use.

Current legislation also provides for the protection of forested land for areas of 200m around lake shores; 100m on either side of navigable rivers; and 50m on either side of water sources and springs. National figures for the extent of land meeting this criteria are not available.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub–region: Central America and Mexico

Name of country/state: Honduras
Total area (sq.km): 112090
Land area (sq.km): 111890

Month/year of reference: 1986

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1645292					
Non–forest						
Plantation						
TOTAL	1645292	0	0	0	0	0

Notes: Natural production forest comprises 5 forest reserves (Cruz, 1986), but this list is not comprehensive.

 The forestry sector is responsible for managing all conservation areas in the country including national parks and reserves. These have not been included in the above table however as they do not constitute legally designated forest areas per. se.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub–region: Central America and Mexico

Name of country/state: Mexico
Total area (sq.km): 1958200
Land area (sq.km): 1908690

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	7000000		71245208			
Non–forest						
Plantation	11500					
TOTAL	7011500	0	71245208	0	0	0

Notes: Protection forest comprises the following: 16 forest reserves covering 2,400,359 ha; 223 protection forest zones covering 68,770,365 ha; 6 reforestation zones covering 60,706 ha; 6 experimental forests covering 13,451 ha; and 1 forest park covering 327 ha (Vargas Marquez, in litt, 1992).

Data for plantation forest is not complete and actual area may be greater.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub–region: Central America and Mexico

Name of country/state: Nicaragua
Total area (sq.km): 130000
Land area (sq.km): 118750

Month/year of reference: 1983

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1605050					
Non–forest						
Plantation						
TOTAL	1605050	0	0	0	0	0

Notes: Natural production forest comprises 3 permanent forest reserves declared between 1969 and 1976 (IRENA–CORFOP, n.d.).

There is no indication as to whether these areas are entirely natural forest – they may contain areas of non–forest or plantation forest.

ANNEX 11.2 (continued)

Region: Tropical Latin America Sub–region: Central America and Mexico

Name of country/state: Panama
Total area (sq.km): 77080
Land area (sq.km): 75990

Month/year of reference: 1988

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1200000		682650			
Non–forest						
Plantation						
TOTAL	1200000	0	682650	0	0	0

Notes: Protection forest comprises 5 forest reserves covering 212,650 ha; 2 protection forests covering 455,000; and 1 water production reserve covering 15,000 ha (IRENA, in litt, 1992).

12 CARIBBEAN



12 CARIBBEAN

Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos, United States Virgin Islands

12.1 HISTORICAL PERSPECTIVE

Nature protection had its basis in the early pre-hispanic Arawak and other periods of the early indigenous cultures dating from pre-15th century AD, respect for nature effectively being an integral part of daily life. A number of sacred areas were believed to have existed in this period, as was testified by archaeological remains, such as in the hills of Puerto Rico.

Early European colonisation throughout the Caribbean led to the establishment of a network of conservation areas largely to safeguard water resources, from the early 18th century onwards. One of the earliest recorded examples of conservation area within the subregion was on Tobago in 1765, when woodland was put aside *"for protection of the rain"* at the main Ridge Reserve. This was followed closely in 1791 by the Kings Hill Reserve, established on St Vincent for the purpose of *"attracting the clouds and rain"*. By 1844 a piece of legislation provided for the protection of natural resources in the Dominican Republic, prohibiting deforestation around river sources. Subsequently in 1907 a law provided for the creation of a body of rural guards to protect the Dominican Republic countryside. The first marine conservation area, Pedro and Morant Banks (Jamaica), was established in 1907, the first national wildlife refuge of Culebro (Puerto Rico) in 1909, the first forest reserve at Grand Etang (Grenada) in 1910, and the first national park at Sierra de Cristal (Cuba) in 1930.

From inception, numbers of conservation areas rose significantly in the mid-1920s and early 1930s and again in the mid-1950s onwards to a peak in the late 1980s. Conservation areas have been established for a wide range of objectives, from watershed protection to wildlife protection, latterly with a broader focus on biodiversity protection. In nearly all geopolitical units (countries and dependencies), conservation areas have their origins in forest or marine protection.

The Caribbean is noted for the considerable number of dependencies of Europe and North America. The role of the parent country, however, varies from one dependency to another. In the UK and Dutch dependencies the highest competent legislation is at the dependency level. In the French and US dependencies, however, a mixture of federal and dependency legislation is in force, but with the parent nation maintaining absolute authority over external affairs and international agreements.

In Aruba and Barbados to Grenada and Haiti, conservation areas, together with associated legislation and administrative bodies, are few or non existent. Cuba, Jamaica, Puerto Rico and the Dominican Republic have more extensive networks, with various separate agencies responsible for forest and soil conservation, fisheries, natural resources and national heritage. In all geopolitical units of the Caribbean forestry and nature conservation legislation is in force, exceptions being Anguilla, Aruba, Bahamas, Barbados, Montserrat and the Cayman Islands which have only one or the other. The legislation of Grenada is representative of a number of Caribbean countries, where, in the absence of specific wildlife legislation, conservation areas are administered by wildlife divisions within the forestry sector.

The number of management authorities varies widely across the subregion, from none in Montserrat to over 12 in the Dominican Republic responsible for natural resources administration. Exceptions to the standard policy of staffing within forestry or wildlife sectors is the 1987 Order of Haiti which defines the terms of reference of the forest rangers who must belong to the Haitian armed forces. Similarly, in the Turks and Caicos the government has accepted a proposal that the civilian police should be responsible for policing marine parks, and local dive operators will be encouraged to continue acting as park rangers (a role which they have been undertaking for a number of years).

Non-governmental organisations are a notable feature of the Caribbean. They often represent the only management body for conservation areas in a number of cases including Aruba, Bahamas and the UK and Dutch dependent territories.

A typical example of current trends is Jamaica where a provisional National Parks Committee was established in 1970 in the Forest Department. In 1972 it was moved to the Ministry of Mining and Natural Resources, and in 1975 was reformed as the national parks branch of the Natural Resources and Conservation Division of the Ministry of Agriculture. The ecological branch subsequently took the first steps towards protected areas establishment in 1979 with the help of the Organisation of American States.

12.2 NATURE CONSERVATION POLICY AND LEGISLATION

At least some form of legal provision for the establishment of managed areas exists in all Caribbean countries. The situation is conceivably least advanced in Montserrat, whilst in other countries and dependencies, such as Aruba and Barbados, policy tends to favour protection of the marine environment, and be lacking for the terrestrial environment. Legal provisions are summarised in Table 12.1 and reviewed below.

12.2.1 Forestry Sector

Mainly comprising small islands, with a mean land area of 9,447 sq. km, many Caribbean countries and dependencies lack any policy, legislation or organisation relating to forest protection, as is the case in Anguilla, Aruba, Barbados and the Cayman islands. A number of Caribbean countries and dependencies have enacted forestry legislation which gives priority to nature conservation, as in the Forestry and Wildlife Act, 1976 of Dominica which focuses on the protection of wildlife within forests and provides for the creation of wildlife reserves.

Policy Constitutional provision for natural resource protection tends to be restricted in the Caribbean. Forestry policy is ingrained in a number of the existing socialist countries of the subregion, as epitomised in Cuba where the 1959 Republican Constitution of Cuba "The State protects national monuments and areas of outstanding natural beauty, historic or aesthetic value, for the benefit of the population".

National forest or conservation policies are increasingly being formulated. A forestry code is in force in the French overseas departments of Guadeloupe and Martinique, and comprehensive forestry management plans exist for a number of British dependencies and commonwealth countries. An example of the latter is St Lucia which has prepared its forestry management plans in collaboration with Canadian International Development Agency (CIDA). This plan has been accepted by the government as the basic policy document for future forestry development.

Objectives include, *inter alia*, the preservation and protection of natural forests which occur on slopes greater than 30°, along river banks, in critical watersheds, on unstable soils, where water supply and recreational opportunities are good, and which provide habitat for endangered or rare wildlife. The plan is typical of those of the subregion, classifying forests as strictly protected, protected with selected production, and production. Another example is Montserrat where forests above 1,500 ft are considered to be protected, and the Ordinance provides stringent measures to deal with land clearance. These have apparently not been invoked.

FAO has been assisting in preparing national forestry policies for Montserrat, Antigua and Barbuda, together with accompanying legislation.

Legislation Forestry legislation exists or is proposed for over 75% of Caribbean countries and dependencies (Table 12.1). Proposed legislation is in the process of being enacted, for instance, in Vincent and the Grenadines as the Forest Conservation Act. In this case, it was to have originally included the designation of national parks within the new draft legislation, but which was subsequently placed under a separate draft act. In another example, in 1987 a draft forestry and wildlife ordinance was prepared for

Montserrat under the auspices of the FAO, making provision for the establishment of forest reserves, protected forests and conservation areas.

In a major number of the geopolitical units of the subregion, the original forestry legislation, covering forest, soil and water conservation, has been inherited from former colonial administrations. For the French territories of Guadeloupe and Martinique, however, the present Forest Code of 1985 of metropolitan France is maintained. Similarly, in the case of the US Commonwealth of Puerto Rico and the US Virgin Islands the Federal legislation applies. By contrast, in the UK and Netherlands dependencies laws are enacted by the dependency governments, and only international activities are coordinated by the parent countries.

Where forestry legislation exists, it tends to be very wide ranging, and usually provides for the reservation of forests. In Puerto Rico, national forests are established under the authority of the Creative Act or Forest Reserve Act, 1891. Under the Multiple-Use Sustained Yield Act, 1960 the range of uses to which forest land is put is recognised. By comparison, in Antigua and Barbuda the Forest Ordinance Act and the Forestry Regulations provide for the protection of lands forested at the time of enactment, prevention of deforestation and reforestation where deemed necessary by the government. In this particular case and other examples within the subregion, the legislation appears not to be in force. In Haiti the protection of the eight forestry conserved areas were upgraded as "parcs nationaux naturels" in a decree of 1983, and two, more extensive sites were created for watershed conservation and the protection of endemic flora and fauna.

In many cases forestry legislation covers only state land or publicly-owned land (including Crown or other state lands). Private forest land may well not be covered, or even selectively excluded from the legislation, as in St Lucia.

12.2.2 Wildlife Sector

Policy Few Caribbean countries and dependencies have formulated nature conservation policies reflecting the relatively recent origins of the wildlife sector. In the self-governing UK dependent Caribbean territories it is government policy to protect natural scenic areas, such as beaches, historic sites and marine life. Each of these dependencies has national park ordinances, fisheries ordinances, even marine parks ordinances and National Trust acts (except Montserrat which has no substantive legislation in place).

Many Caribbean protected areas systems have been based on the definitions on those recognised by the FAO Latin American Network of Technical Cooperation in National Parks, Other Protected Areas, Flora and Wildlife (Red Latinoamericana de Cooperación Técnica en Parques Nacionales, Otras Areas Protegidas, Flora y Fauna Silvestres), as in the case of the Dominican Republic. Such a network is unified by comprehensive legislation, stating national conservation objectives and defining a range of management categories. The network attempts coordination between the political units of the Caribbean.

Existing National Systems for Conservation Protection exist for eight countries and dependencies (Anguilla, Antigua and Barbuda, British Virgin Islands, Cuba, Dominica, Dominican Republic, Grenada and Trinidad and Tobago). Draft national conservation strategies involving systematic analysis and conservation area planning have been drawn up, but not yet implemented, by the Bahamas, Barbados (with the help of IUCN), Haiti, Jamaica, Netherlands Antilles, St Lucia, St Vincent and the Grenadines and the US Virgin Islands. Those of Jamaica and St Lucia are in the final stages of development.

Legislation Conservation areas legislation has evolved gradually over time, beginning with the Bahamas (Wild Birds Act) in 1905, and gaining momentum in the late 1950s and early 1960s (Bahamas, British Virgin Islands, Guadeloupe, Haiti, Trinidad and Tobago, US Virgin Islands). The legislation has been reviewed in the 1980s and early 1990s for all geopolitical units.

Some legislation is all embracing such as the National Conservation and Environment Protection Act, 1987 of St Kitts and Nevis which provides not only for protection and management of natural and historical

resources within designated areas, but also the creation of a Conservation Commission with statutory powers, and also assigns additional powers to a non- governmental organisation (NGO).

A number of Caribbean countries, such as Grenada and Montserrat, lack substantive legislation that provides for the establishment and management of conservation areas. However, in the case of Grenada the Forest, Soil and Water Conservation Ordinance makes provision for the establishment of both forest and marine reserves, to protect timber, water resources and fisheries. In general, less emphasis is placed on the preservation of habitat and recreational resources (compare this, however, with natural forest protection in Puerto Rico under the Wilderness Act, 1964). A number of countries have a legal framework for establishing conservation areas, but have not yet designated any sites, for example St Kitts and Nevis under its Fisheries Act, 1984 and National Conservation and Environment Protection Act, 1987. Some Caribbean countries lack conservation area legislation *per se*, but legislation exists which provides authority to NGOs to set up their own conservation areas. Examples are the National Trust acts in Anguilla, Bahamas, Cayman Islands, Montserrat and St Lucia, which provide for statutory trusts to promote, conserve and manage land (and marine areas in the first three cases) of special natural or cultural interest and protect the wildlife which they support. In other cases, the National Trust acts support or provide the basis to subsequent national park legislation, as in St Vincent and the Grenadines.

Present nature conservation legislation in the Caribbean provides for the establishment of over 20 different designations of conservation area, ranging from marine park, reserve and fish sanctuary, to protected beach, and national park to bird sanctuary and reserve, faunal refuge and scientific reserve (see Table 12.1).

In general, conservation areas are established under individual decrees (e.g. Grand Etang Reserve Ordinance, 1960, Grenada). In countries such as Jamaica, where the existing legislation is under review, there is a range of legislation from individual site decrees to legislation for watershed protection, and to a lesser extent to beach control and town and country planning acts. In this country the Forest Act, 1937 remains the principal law for the declaration of reserves especially on forest land.

12.2.3 Other Sectors

Most conservation areas are covered under the forestry or wildlife sector, including the marine, estuarine and coastal protected areas sectors which are perhaps the most dominant features of the Caribbean; but marine-related legislation is found in nearly 60% of countries and dependencies within the subregion.

There is a variety of legislation, such as Fisheries acts (e.g. St Vincent and the Grenadines), Coastal Zone Management acts (cf Puerto Rico) and Marine Protection, Research and Sanctuaries acts (US Virgin Islands), which provides for the creation of marine areas. Such legislation, emphasising sustainable multiple-use and planning, has the advantage of protecting a discrete ecosystem, as opposed to individual natural resources and species under several different laws. Terrestrial equivalents are represented by the Town and Country Planning Acts, as in St Vincent and the Grenadines where legal provisions are made in order to incorporate natural areas and forestry reserves as part of the integrated land use planning approach. Under the Mustique Conservation Act, 1989 the entire island, including its marine environment, is designated for protection.

12.3 MANAGED AREAS ADMINISTRATION

The diversity of natural and cultural heritage within the Caribbean is reflected in the variety of institutional mechanisms for administering managed areas which are often complex, with a number of agencies operative in any one country or territory. These include government agencies, national metropolitan agencies in dependent territories, independent statutory or quasi-governmental bodies, NGOs, local communities and private entities.

12.3.1 Forestry Sector

Emergence of the forest sector is known to date back two centuries, to the British, French, Spanish and Dutch colonial authorities, the earliest recorded examples being Tobago in 1765 and 1791 in St Vincent.

In general, administration of managed areas tends to be undertaken by separate agencies as in Cuba, Dominican Republic, Grenada, Martinique, Puerto Rico, St Kitts and Nevis, St Lucia and US Virgin Islands. The forestry sector administers all protected areas in Trinidad and Tobago. Separate divisions of forestry and wildlife within a single Ministry are perhaps the commonest variant. There is an increasing trend, however, to the establishment of separate or autonomous government departments directly under the Presidential or Prime Minister's Office as in the Dominican Republic.

Countries with no specific governmental administration for forestry protection include Anguilla, Aruba, Bahamas, Barbados, Cayman islands, Netherlands Antilles, Turks and Caicos and US Virgin Islands.

12.3.2 Wildlife Sector

In general, Caribbean conservation areas have been established in isolation from other development sectors, except in some cases to fisheries and forestry. Few mechanisms for linkages with other sectors are in place. Primary responsibility of the environment as a whole is increasingly being transferred to environmental agencies to coordinate all matters concerning the environment, such as under ministries or divisions of the environment, as in St Vincent and the Grenadines and Trinidad and Tobago. However, responsibility for forests and wildlife lies frequently with separate departments of completely different agencies of the same ministry (see section 12.3.1 above). Exceptions include Montserrat with no governmental agency with responsibilities for wildlife conservation.

Often the forestry sector has overall responsibility for the wildlife sector, a legacy from an early date when forest protection for watersheds was the priority. However, even in recent 1984 legislation for Grenada there remains the provision for the Chief Forestry Officer to protect natural and undisturbed habitat for flora and fauna. In this case, just a single member of staff exists in the National Parks and Wildlife Unit within the Forestry Department.

In the overseas territories of France, the Office National des Forêts (ONF), a commercial public establishment, is responsible solely for management of all state forests in Guadeloupe. However, in Martinique, the ONF has responsibility for administering parks and reserves, as well as national forests. In Guadeloupe, this office is also responsible for the creation of parks and reserves but not their administration.

In a very few countries, such as Haiti, the forest rangers are a specialised corps of the armed forces accountable to the Civil Defence. They are responsible for the surveillance of catchment basins, forests, national and communal parks and natural sites. They operate in collaboration with the appropriate public authorities, and receive military and technical training. Similar forms of protection are provided by civil police forces for the numerous marine sites throughout the Caribbean.

In some countries administration is divided into a number of agencies, both governmental and private. In Cuba, for example, the Ministry of Agriculture (MINAG) is vested with the responsibility for forest land, and for other soils, fisheries, and agriculture. Responsibility for managing the national network of conservation areas is assigned to the various institutes as follows: national parks, faunal and floral refuges and unassigned areas to the MINAG; natural reserves to the Academy of Sciences; national monuments to the Ministry of Culture and natural tourist areas to the National Institute of Tourism.

Overall, the Dominican Republic, with 12 agencies, has the most within any one geopolitical unit within the subregion.

12.3.3 Other Sectors

Where areas are protected for their value as watersheds, management also involves Water Commissions or some other independent water authority. Under proposed national park plans, such as in Grenada, the Ministry of External Affairs, Agriculture, Lands, Forestry, Tourism and Legal Affairs would be designated as the agency responsible for planning, management and protection of all such areas in the system.

Within Puerto Rico, four US federal agencies have responsibility for natural resource management as do three commonwealth agencies. By comparison, there is collaboration between 12 governmental and non-governmental agencies in developing the parks and protected areas systems plan in the Dominican Republic, using a participatory approach to ensure public input during the development phase of the plan.

Being an important subregion for tourism, government tourism agencies have had a major input to conservation areas administration right across the Caribbean. For example, in February 1986 the Ministry of Tourism in Jamaica established a Marine Parks Action Committee (MPAC) to investigate ways of effectively administering marine parks already notified.

12.3.4 Non-Governmental Organisations

NGOs have a significant role to play within the Caribbean region. They contribute to the management of protected areas throughout the region, and in many cases are involved in ownership of private or state reserves. One of the most frequent types of private nature conservation body is the National Trust, such as that of St Lucia, which has primary management responsibility for national historic parks and nature reserves. National Trusts are frequently set up as statutory bodies, under legislative acts as in St Vincent and the Grenadines. In islands, such as Montserrat, where there is no government agency responsible for wildlife conservation, the National Trust has taken over sole responsibility for natural resource conservation.

The Bahamas National Trust, a non-governmental self-funded organisation, is responsible for the management of conservation areas of that country. In addition, it was instrumental in the revision of the schedule to the Wild Birds Protection act, 1979, and owns and manages at least one protected area.

Since 1963 administration of conservation areas in Aruba has been the responsibility of an NGO, the Netherlands Antilles National Parks Foundation and the Aruba independent office (STINAPA). The aim of this organisation is to promote nature conservation through acquisition of land, establishment of parks and by education.

In Dominica forest resources are vital to development of the island, yet land capability studies have suggested that large-scale timber extraction is not feasible (largely as a result of high rainfall, rugged topography and transport difficulties). This has led to the development of a project designed to demonstrate a private sector approach to achieving conservation and development objectives, under the auspices of the Eastern Caribbean Natural Area Management Program. As will be seen in sections 12.5.1, 12.5.2 and 12.5.3 international and regional non governmental agencies made major contributions towards protected areas development in the Caribbean.

12.4 MANAGED AREAS STATUS

The protected areas system is mapped for each country within the subregion in Fig. 12.1. Details of individual conservation areas are given in Annex 12.1 which also serves as a key to the maps.

12.4.1 Managed Areas within the Forestry Sector

Coverage Natural forest lands account for some 10.2% of the total area of the Caribbean (Table 12.2). Most (84%) of this is found in Cuba with about 20,200 sq. km. At the national level, forest lands are most extensive in the Vincent and the Grenadines (73.1%), Trinidad and Tobago (29.2%) and the British Virgin Islands (32.3%), where all land under forest has been either reserved or nationalised (such as on Crown

land). There are reported to be no reserved forest networks in Anguilla, Aruba, Bahamas, Barbados, Cayman Islands, Netherlands Antilles, St Kitts and Turks and Caicos. In the Dominican Republic and Haiti relevant information is unavailable although forest estate is believed to exist (see Table 12.2).

Overall in the Caribbean approximately as much of the forest estate is reserved for commercial production as for protection and conservation purposes. However, in examples such as the British Virgin Islands, St Vincent, St Lucia and Guadeloupe, there are increases in protection and conservation over production forest (see Table 12.2).

Islands where the forest estate is solely under a production category include Grenada, Antigua and Barbuda. Production, protection and conservation functions of the forest lands are not distinguished in such countries as Jamaica. By contrast, in Puerto Rico all the forest is listed as conservation forest. Although in islands such as Antigua there is designated forest estate, 3,100ha of this legally protected forest is in actual fact within national park. In Montserrat forest land totals 5,000ha and 5,000ha in St Kitts and Nevis, although in neither case are details of forest function available.

12.4.2 Conservation Areas within Forestry and Wildlife Sectors

Coverage There are some 697 legally designated conservation areas in the Caribbean, covering a total area of 2.8 million ha or 12.0% of the region (Fig. 12.1, Tables 12.3 and 12.4). The forestry sector is directly responsible for some 238 conservation areas, covering a total area of 0.3 million ha or 1.4% of the region. Most of these lie in St Lucia, Trinidad, Puerto Rico and Martinique (Table 12.3). Approximately 18% of these conservation areas are under total protection, covering 32.8% of the subregion (Table 12.3).

The 10% target of total area under protection for conservation purposes has been reached in a significant number of 13 geopolitical units including Antigua (15.1%), Bahamas (8.9%), Cayman (35.1%), Cuba (12.0%), Dominica (22.2%), Dominican Republic (19.9%), Guadeloupe (23.9%), Jamaica (8.7%), Martinique (65.2%), Netherlands Antilles (16.0%), St Vincent (21.3%), Turks and Caicos (40.9% when including marine sites), British Virgin Islands (14.9%) and US Virgin Islands (42.93%) which have extensive conservation area networks. Least extensive are those of Anguilla (0%), Aruba (0.2%), Barbados (0.6%), Grenada (1.8%), Haiti (0.4%), Montserrat (2.4%), Puerto Rico (5.4%), St Kitts (0%), St Lucia (15.5%) and Trinidad and Tobago (4.0%), all of which fall well below the 10% target.

These figures tend to be somewhat misleading, as they include significant areas of entirely marine or coastal protected areas. For example, in the case of Bermuda the estimate appears to exceed the 100% figure as the two sites of any size are marine reserves which include no land area at all.

Representativeness Nature conservation areas have often been established haphazardly in the past, with little regard to ecological or other criteria for their selection. This is reflected in the existing networks of Aruba, Grenada, Haiti and Jamaica, with freshwater and marine habitats being well represented, and Anguilla and Montserrat where a number of critically important ecosystems are largely unprotected. A more systematic approach has been adopted recently in Cuba (1981) following the approach identified by the FAO Latin American Network of Technical Cooperation in National Parks, Other Protected Areas, Flora and Wildlife, by which the existing network has been reviewed and plans formulated for a comprehensive network representative of the full range of biological diversity within the country. Almost all the ecosystems of conservation value in the country are included in the national network, with 2% not represented at all, notably coastal regions. However, although the protected area system covers 12% of the total land area, 56.8% of the total land is afforded strict protection (this compares with the previous network on Cuba when many reserves were too small to afford adequate protection). Plans are underway in the US Virgin Islands and Jamaica to develop an optimal network.

In Trinidad and Tobago, as part of a collaborative project between the Forestry Division and the Organisation of American States, a policy for the establishment and management of a national park system was published in 1980. This policy is relatively comprehensive, and reviews all existing conservation areas as well as identifying new sites in different ecosystems. Post 1988, three sites have been degazetted, Morne l'Enfer, Valencia and Kronstadt wildlife sanctuaries, in order to rationalise the network. It has also been

reported that the government anticipates a conservation areas system that will protect cultural features as well as the natural environment.

Integrity Given that, in effect, conservation areas have been increasingly established as islands in a sea of humanity, they should be theoretically as large as possible to maximise the degree to which their contents retain their integrity. The optimal size of island conservation areas will vary with respect to the key species under protection, and to the degree of island isolation. Within the Caribbean subregion there is a high degree of island endemism, such that small properties of only a few hectares under protection have an important role to play in the conservation of wildlife, and cannot be directly compared with the size of conservation areas in a continental context.

Using mean size as a measure of integrity, data in Table 12.4 indicate that overall 83.2% of sites are less than 1,000ha in size, and that there is none over 100,000ha. This largely reflects the insular character of the subregion.

The conservation areas in the Dominican Republic tend to be by far the largest (mean of almost 46,300ha), followed by Bahamas, Cuba, Guadeloupe and Martinique with mean areas over 5,000ha. The smallest are those in Aruba, Barbados, Montserrat, British Virgin Islands, St Kitts and Nevis which tend to be less than 100ha. Networks in Cuba and the Dominican Republic tend to be optimal, comprising a relatively small number of large conservation areas over 4-5,000ha. The opposite holds for the British Virgin Islands, Turks and Caicos and Jamaica which are reported to hold many small conservation areas, often isolated from each other by settlements, plantations and agricultural land. Over three-quarters of the entire islands of Mustique, St Johns (US Virgin islands) and Martinique are protected, either totally in the case of St Johns or partially in the other cases.

There are only partially protected areas in Aruba, Barbados, Grenada, Haiti, Jamaica, Montserrat, St Kitts and Nevis, St Vincent and the Turks and Caicos. As might be expected, the mean size of totally protected areas in the region (10,345ha) is somewhat greater than that of partially protected areas (6,284ha). National and marine parks constitute the bulk of the former category and by definition they tend to be relatively large areas to provide a range of services. The latter category comprises mainly marine sanctuaries, wildlife and other reserves, many of which have been established to protect specific sites for marine fish or other resident or migratory fauna.

Effectiveness Apart from inadequate representation of the subregion's biological diversity within existing conservation area networks, conservation efforts are limited by weaknesses in policy and legislation, inadequate institutional support and ineffective management.

As mentioned in Section 12.2, nature conservation policies have been formulated in only eight of the 25 countries and dependencies. While seven countries have yet to introduce legislation to provide for the establishment of conservation areas (Anguilla, Antigua and Barbuda, Aruba, Barbados, Cayman islands, Montserrat and Netherlands Antilles).

In four islands (Bahamas, British Virgin Islands, Grenada and St Lucia) all encompassing organic acts provide for Trust or National Trust acts which enable specified NGOs to acquire and manage private and state conservation areas. Unimplemented nature conservation strategies are found in at least ten islands. Very often, existing legislation needs strengthening or updating. In Jamaica, for example, existing nature conservation legislation is being amended to provide for new designations of reserve, zonation (including the establishment of buffer zones) and to enhance presently inadequate penalties for infringements.

Management is frequently hampered by the necessary but lengthy legal procedures towards enacting legislation, particularly those which relate to settlement of rights. In Jamaica comprehensive recommendations in 1981 have yet to be implemented.

Institutional resources for conservation areas management tend to be inadequate throughout the subregion. While comprehensive data for national expenditure in conservation areas are not readily available, World Bank (1991) statistics indicate that expenditure on nature conservation is less than 10% of national budgets

in virtually all countries. In low income countries, such as Dominica, US\$ 36 million is provided for by the Ministry of Agriculture for Gross Domestic Product (GDP); 42.2% (US\$ 349,500) of the expenditure on the forestry and wildlife sector in 1991-92 was earmarked as capital expenses for conservation or managed areas, the remaining 57.8% (US\$ 478,000) was for recurrent expenditure in the Forestry Division. By contrast, US\$ 2.76 million was budgeted for protected areas in the higher income French dependency of Guadeloupe (GDP of US\$ 5,515). In the low income country of Jamaica (GDP of US\$ 960), recurrent expenditure in the financial year 1989-1990 included US\$ 4.9 million (forest administration and soil conservation) and \$ 2.5 million capital (forestry, watershed management and conservation).

The combination of numerous management bodies with separate responsibility for differing managed areas in the same political unit (and of federal and island authorities often repeating actions), and of a general lack of commitment of resources, personnel and legal backup for conservation areas, are all largely responsible for many of the deficiencies in conservation area management. Management is not planned in the majority of conservation areas, and where management plans have been formulated they tend to be inadequate or out-of-date.

Management is generally weak, often ineffective and in some cases non-existent. Enforcement is very often handicapped by the absence of suitable legislation which provides even details of definitions or regulations. Encroachment is ubiquitous, few conservation areas being free from this problem, particularly marine areas where enforcement is particularly exacting. It is both indicative of inadequate vigilance and enforcement measures and symptomatic of the level of human pressure on natural resources to meet subsistence needs.

12.4.3 Contribution of the Forestry Sector to Nature Conservation

Conservation management function is restricted to 6.3% of forest lands in the Caribbean. As data is currently available for only a limited number of countries, however, this figure may be misleading (Table 12.2). Furthermore, as discussed in Section 12.2.1, a number of countries have formulated policies under which logging is prohibited above certain altitudes and on slopes exceeding specific gradients (see Annex 12.2 for details of individual countries), but national statistics on the extent of forest lands meeting such criteria are not available. Thus, the contribution of the forestry sector to protection and conservation is much higher than suggested by the statistics in Table 12.2.

The major proportion of the surface area (86%) of the conservation areas network falls within the domain of the wildlife sector, although much of it was originally part of the state forest estate and subsequently upgraded with the introduction of nature conservation legislation.

12.5 FUTURE PROSPECTS

12.5.1 Expanding the Conservation Area Network

Official proposals to expand the network total some 0.6 million ha, or 2.4% of the total area of the subregion (Table 12.3). Most of the improvements to the network are illustrated by Barbados, where expansion from 0.6% and 11.6% of total area is proposed, in Jamaica which proposes to expand its network to 24%, and in Grenada where the area planned for protection will increase from 1.8% to 11.4% of total area. Other examples include St Vincent which intends to increase its network from the existing 21.3% to include a further 10%. Both Jamaica and Montserrat indicate that there are proposals to increase their networks to over the 10% minimum target. Other significant extensions to existing national networks are planned for Trinidad and Tobago, where a list of 61 areas meritorious of being protected increases the total protected from 3.9% to 13.5% of the country, while plans for the Bahamas identified 52 additional sites (see Section 12.4.2).

In 1983, the Bahamas National Trust submitted to the government a proposal entitled "The Development of a National Park System for the Commonwealth of the Bahamas" identifying 52 additional sites throughout the islands which it felt should be given some protection, and defined three categories of protection: national park, national reserve and protected area. This was followed in 1984 by a national conservation strategy

which also recommends the development of a representative system of protected areas. This was subsequently rationalised during June 1990, identifying 12 sites of the highest priority.

12.5.2 Other National Initiatives

There are an increasing number of initiatives throughout the Caribbean towards strengthening the systems, as epitomised in Haiti, where a national conservation strategy was drawn up in 1987. Among the recommendations formulated were the following: 1) creation of an independent government agency to be responsible for the planning and execution of conservation policies and programmes; 2) promulgation of more appropriate and adequate conservation legislation; 3) preservation and protection of natural ecosystems; 4) protection of the endemic gene pool; 5) an increase in scientific research; 6) establishment of a conservation education programme; 7) integration of the national conservation strategy into the national development programme to ensure its effective execution and to assure that development projects are environmentally sound; 8) watershed protection; 9) increase of forest reserves; and 10) development of national parks. Unfortunately, just after the publication of the national conservation strategy, the Ministry of Plan, responsible for its production, was abolished, and replaced by a Commissariat of Planning. Changes in personnel, priorities and the physical location of the planning organisation stopped any further development or execution of the NCS, which although incomplete, was a very positive step towards a functional and integrated conservation policy.

Strengthening networks A variety of initiatives to strengthen conservation areas planning and management is being implemented or formulated. As mentioned elsewhere, a series of regional initiatives is underway including the FAO Tropical Forest Action Plan (TFAP), an international strategy to promote the development of forestry sectors in participating countries, allowing greater contribution to national economy while maintaining conservation principles. Likewise, networks are being strengthened by following the definition given by the FAO Latin American Network of Technical Cooperation in National Parks, Other Protected Areas, Flora and Wildlife (Red Latinoamericana de Cooperación Técnica en Parques Nacionales, otras Areas Protegidas, Flora y Fauna Silvestres), a system of protected areas which exchange information and together attain specific conservation objectives (see also Section 12.5.3).

Forest resources are vital to the development of a series of Caribbean countries, yet land capability studies have suggested that large-scale timber extraction is often not feasible. In the case of Dominica this has led to the development of a project designed to demonstrate a private sector approach to achieving conservation and development objectives. This project is being initiated through the Eastern Caribbean Natural Area Management Program (renamed and known as the Caribbean Natural Resources Institute), with support from the WWF-US/US-AID Wildlands and Human Needs Program.

In Dominica forest resources are vital to development of the island, yet land capability studies have suggested that large-scale timber extraction is not feasible due to the high rainfall, rugged topography and transport difficulties). This has led to the development of a project designed to demonstrate a private sector approach to achieving conservation and development objectives. This project is being initiated through the Eastern Caribbean Natural Area Management Program (renamed and known as the Caribbean Natural Resources Institute), with support from the WWF-US/US-AID Wildlands and Human Needs Program.

Overcoming Economic Constraints Funding is a major factor which often limits the effective management of conservation areas. In the Caribbean, tourism is the sector with the greatest potential for economic support of conservation areas.

International interest in the subregion is extremely high, due to the high biodiversity, unique fauna and flora for small island groups. Large amounts of funding are thus available from international, multinational and binational agencies as well as from numerous NGOs. In 1986 a partnership of WWF-US, the Rockefeller Brothers Fund and the Island Resources Foundation (based in the US Virgin Islands) initiated a scheme to strengthen private sector natural resource management programmes in the Eastern Caribbean, including target or priority islands such as Dominica. In this particular case objectives will focus largely on encouraging improved NGO programme planning, proposal writing, project management, communication, fund raising and administration. In St Lucia an overall work plan for a five-year CIDA-funded Forest

Management and Conservation Project is detailed (1987); objectives are based on the Forest Management Plan and include implementation of a programme of forest management and conservation.

Initiatives considered to have a large potential within the Caribbean include debt-for-nature exchanges, whereby the national debts of a country are reduced in exchange for some conservation activities. In the Dominican Republic, US\$ 80 million is eligible for debt-for-nature. Dominica, Jamaica and Haiti could well follow through with debt transactions.

Conservation areas play a vital role in the tourism industry throughout the majority of the Caribbean islands, attracting divers, sunbathers, trekkers and those interested in the countries' wildlife, cultural diversity or tranquil and relaxed lifestyle. Currently there are over 11.3 million visitors to the islands each year; in the US Virgin Islands alone they spend US\$ 510 million. Buck Island Natural Monument is perhaps a representative example, receives 50,000 visitors annually. In St Lucia, which attracts 117,000 visitors annually, an estimated 116,000 enter Pitons National Park and spend an estimated US\$ 534,000. Tourism is the main economic activity in the British Virgin Islands, income from which has nearly tripled during the period 1978-1982. As the tourism industry is based on the marine environment, this was a significant factor leading to the development of the islands' conservation areas. For example, Wreck of the Rhone Park receives 45,000 divers each year, bringing in a total of US\$ 14 million annually. Montego Bay National Park in Jamaica has projected visitor number statistics of 0.1 million annually, with a projected cash income of US\$ 395,000 income from tourism, concessions and other sources. These can be regarded as major financial boosts, or almost the sole form of income, to the respective protected areas authorities.

The Caribbean Heritage Park System and Trust Fund, is being promoted by the Caribbean Natural Resources Institute (CANARI) to link conservation and development. The Fund will help to provide finance the development and maintenance of the park system.

Improving Management Recent regional survey reviews of the status of conservation areas throughout the Caribbean region have indicated that many are unmanaged, not legislated for, or poorly administered, with little consideration given to resolving conflicts between the authorities and those living in or around them. A major initiative has been instigated by the IUCN Commission on National Parks and Protected Areas (CNPPA)/Caribbean Steering Committee to promote the regional action plan, which will be implemented by governmental and NGO organisations, and private enterprise (see Action Plan listed in 12.6). Country Environmental Profiles in a selection of Caribbean islands have been prepared to overcome just some of these subregion-wide constraints and gaps in knowledge. Agreement for the first Profile was made in May 1987 between the Caribbean Conservation Association (CCA) and the government of St Lucia (Ministry of Planning).

A new approach to land-use management throughout the Caribbean is planned to incorporate conservation areas more into the various five-year investment programmes. Plans have already been instigated in coastal zone management acts, such as in Puerto Rico, which has been formulated to manage conservation areas in an integrated approach rather than in isolation to each other as is traditionally the case. Another recent initiative has been established by The Nature Conservancy of the USA, in conjunction with government and non-government organisations, in the Caribbean and South America. The initiative, "Parks in Peril, a Conservation Partnership for the Americas", is a partnership which intends to select 20 critical sites each year for ten years and to provide comprehensive on-site conservation management for these, and to prevent any deterioration of their quality.

In the British Virgin Islands two new pieces of environmental legislation have been drafted: a new Protected Areas and Wildlife Act, 1987, and a Coastal Conservation Act, 1987. Once enacted, this comprehensive legislation is expected to make a major contribution to improving the territory's capacity for sound environmental planning and management. In the British Virgin Islands the initiative for development of marine conservation areas has been the subject of collaboration between the government and the Eastern Caribbean Natural Areas Management Programme. Initial surveys resulted in eight marine areas being identified as warranting protection. Following endorsement of these areas by the government, the project was extended into a second phase of research, planning and implementation. Two particular concerns were

to integrate marine and terrestrial components of the conservation area network, and to provide recreational areas for the local population. A further five areas were recommended.

Until the recently enacted legislation in Cuba, the institutional framework for the management of protected areas had long been regarded as flawed, primarily because laws had been passed without sufficient consideration of staffing and budgetary requirements, perhaps a recurrent issue throughout the Caribbean. Deficiencies in existing forestry and wildlife policy, legislation and regulations are recognised as deterrents to proper management of forest resources. With the assistance of FAO, a draft national forestry and wildlife policy and a draft Forestry Act and a draft Wildlife Act have been in the process of preparation. Administrative responsibilities in the subregion are widely not clearly defined, as epitomised by Barbuda. In this case, forest resource use policies are formulated by the National Institute for Forest Development (INDAF). Forested land is administered by the Forest Administration within the MINAG. The Forest Administration is headed by a vice-minister and comprises three departments, one for each of its functions: silviculture; protection of forests and fauna; and industrial forestry. A separate unit carries out forest inventories. In each province there is a forest department within the provincial offices of the Ministry of Agriculture.

12.5.3 International Initiatives

Conventions and Programmes Most countries within the subregion participate in one or more international conventions and programmes concerned with conservation areas (Table 12.5). All countries except Aruba, Bahamas, Barbados, Dominica, Grenada, Guadeloupe, Martinique, Netherlands Antilles, St Antilles, St Vincent and the Grenadines, Trinidad and Tobago have accepted or ratified the Convention Concerning the World Cultural and Natural Heritage, but not one country has had any natural properties inscribed in the World Heritage List, several of which are outstanding examples of tropical rain forest. Eight countries and dependencies have acceded to or ratified the Ramsar Convention, but no sites have been listed. Several countries have set up National MAB Committees under the Unesco Man and the Biosphere Programme. To date, biosphere reserves have been designated only in Cuba, Puerto Rico and US Virgin Islands. Although little applied in the subregion, the biosphere reserve concept, with its emphasis on sustainable development and environmental management, is very well suited to the conservation of Caribbean islands. The concept being promoted through workshops such as a series of international MAB workshops was held in Puerto Rico in 1986 on "Sustainable development and environmental management of small islands".

Regional treaties include the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Western Hemisphere Convention), and the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) with its related protocols. Protocols associated with the latter include the Protocol Concerning Co-operation in Combatting Oil Spills in the Wider Caribbean Region and the Protocol Concerning Specially Protected Areas and Wildlife which was signed by geopolitical units of the Caribbean in 1991, but is yet to be ratified. A number of the Caribbean countries and dependencies participate in the FAO Tropical Forest Action Plan (TFAP), an international strategy to promote the development of forestry sectors in participating countries, allowing greater contribution to national economy while maintaining conservation principles. Under this initiative, the Forestry Action Plan for Cuba (Plan de Acción Forestal para Cuba) was initiated in 1989 by the Ministry of Agriculture (Ministerio de Agricultura) and other organisations with interest in the forestry sector, to interpret the global designs of the TFAP into specific national needs.

Other programmes include the IUCN Marine Conservation Strategy for the Caribbean Survey of Conservation Priorities in the Lesser Antilles; Caribbean Program of the Nature Conservancy (USA), Marine Parks Program of the Caribbean Conservation Association, Parks and Protected Areas Program of the Caribbean Natural Resources Institute, Caribbean Program of the WWF US and the Protected Areas Programme of the Organisation of Eastern Caribbean States.

Cooperative agreements An Action Plan for the Environment in Latin America and the Caribbean, prepared by UNEP, was approved in October 1990. Included in the Action Plan are programmes for the protection of natural areas and of the cultural heritage; the management of national and international river

basins; the conservation of biological diversity; environmental education; development and environmental planning; and the management of protected areas.

Opportunities for international cooperation in management are limited by the insular nature of the Caribbean. The sole initiative to establish a transboundary park is for the joint Dutch and French dependency of St Maarten, where STINAPA St Maarten has published proposals for a conservation area that would include both Dutch (Belvedere) and French territory (Les Deux Frères). It is recommended that the Parc Naturel de Guadeloupe, or any French foundation, should own the French part and that STINAPA should own the Dutch part. Administration would be by one bi-national management committee with two national sub-committees.

12.6 PRIORITIES FOR ACTION

Priorities for conservation action in the subregion were reviewed as part of the IUCN Systems Review of the Caribbean Realm for the IV World Park Congress (Putney, 1992). These are generalised, recognising that translation of priorities into action will vary according to national conservation objectives, history and political will. They provide a foundation to the more specific priorities identified in this report and summarised for each country in Table 12.6.

Action priorities were discussed during the Santo Domingo meeting of the CNPPA/Caribbean membership and subsequent meetings in the lead up to the IV World Parks Congress. Guidelines for action emerged as:

1. the focus of regional activities should be on enhancing management capacity within the region, and avoiding becoming dependent on outside support;
2. the priorities, in descending order of importance, should be networking, regional support services, technical cooperation, and the development of demonstration projects;
3. existing institutions should be used as much possible.
4. priority should be given to strengthening specific and complementary capabilities on different islands, thus promoting centres of excellence;

The overall goal of the final Action Plan of CNPPA is to increase the number of effectively managed national parks and protected areas in the Caribbean. This is achieved by: enhancing local capacity to manage protected areas, through networking, regional support, technical cooperation, and demonstration; promoting collaboration and regional self-sufficiency; and collecting and analyzing information and opinions in the region so that priorities can be updated, and effective programmes defined, funded and implemented.

In conclusion, remarkable progress has been shown in the development of national conservation areas networks in the subregion over the last few decades. The most positive trend has been the growing awareness of the values of conservation areas and the increased recognition that conservation often represents the most appropriate form of land use for such areas. The greatest challenge, which has still to be adequately addressed, is the need to involve local communities as partners in managing conservation areas.

REFERENCES

- CNPPA (1991). 35th Working Session, IUCN Commission on National Parks and Protected Areas, Santo Domingo, 29 April-3 May.
- Johnson, T.H. (1988). Biodiversity and conservation in the Caribbean: profiles of selected islands. *ICBP Monograph No. 1*. 144 pp.
- Johnson, M.S. and Blackett, H.L. (1990). Bibliography on forestry in CARICOM countries of the Eastern Caribbean. Natural Resources Institute, Chatham, Kent, UK. 116 pp.
- Houseal, B., MacFarland, C., Archibold, G., Chiari, A. (1985). Indigenous cultures and protected areas in Central America. *Cultural Survival*, March: 10-19.
- Island Resources Foundation (1991). *Directory of Environmental NGOs in the Eastern Caribbean*. Island Resources Foundation, US Virgin Islands. 46 pp.
- Mendez, J.L. (1992). Towards a Latin American strategy for the salvation of wildlife. Servicio Autonomo de Fauna (PROFAUNA), Ministerio del Ambiente y los Recursos Renovables (MARNR), República de Venezuela. 16 pp.
- Putney, A.D. (1992). Regional Review: Caribbean. Regional Reviews, IUCN, IV World Congress on National Parks and Protected Areas, Caracas, Venezuela, 10-21 February 1992. Pp. 14.1-14.28.
- TNC (1990). *Parks in peril, a conservation partnership for the Americas*. The Nature Conservancy, Washington, DC. 24 pp.
- Ugalde, A. and Godoy, J.C. (1992). Regional Review: Central America. Regional reviews, IUCN, IV World Congress on National Parks and Protected Areas, Caracas, Venezuela, 10-21 February 1992. Pp. 13.3-13.27.
- van't Hof, T. and Gardner, L. (1991). Enhancing the skills of protected area professionals in the insular Caribbean. *Parks* 2(1): 28-31
- WCMC (1988). Draft Review of Protected Area systems in the Caribbean Islands. Protected Areas Data Unit, World Conservation Monitoring Centre, Cambridge, UK. 123 pp.

Table 12.1 Legal provisions for protected areas, with year of enactment and responsible administrative authority. Protected areas are classified according to management objective (T = total protection, P = partial protection, L = local extractive use, C = commercial extractive use).

Country	Legislation		Administrative authority	Managed areas	
	Year	Title [Sector]		Man.	Designation
Anguilla (UK)	1982	Marine Parks Ordinance [W]	Department of Fisheries and Marine Resources	P	Marine park
	1988	Beach Protection Ordinance No. 10 [A]	Office of Chief Minister	P	Protected beach
Antigua and Barbuda	1941	Forest Ordinance Act [F]	Ministry of Agriculture, Land & Fisheries	P	Protected forest
	1972	Marine Areas (Preservation and Enhancement) Act No. 5 [F]	Ministry of Agriculture, Land & Fisheries	P	Marine area
	1984	National Parks Act [W]	National Parks Act [W]	P	National park
	1983	Fisheries Act No. 14 [A]	Fisheries Department	P	Marine reserve
Aruba (Netherlands)	1985	Marine Environment Ordinance [W]	Aruban Foundation for Nature and Parks	P	Bird sanctuary
Bahamas	1959	Bahamas National Trust Act [W]	Bahamas National Trust	P	National park
	1905 1951	Wild Bird Protection Act [W] Wild Birds Protection (Reserves) Order [W]	Ministry of Agriculture	P	Wild bird reserve
Barbados	?	Barbados National Trust Act [W]	National Trust	P P	Marine park Reserve
	1976	Marine Areas (Preservation and Enhancement) Act [W]	National Conservation Commission	P	Marine reserve

Bermuda (UK)	1986	Bermuda National Parks Act [W]	Conservation Division	P	National park Nature reserve
	1966	Coral Reef Reserve Act [W]	Conservation Division	P	Preserve
	1975	Protection of Birds Act [W]	Conservation Division	P	Bird preserve
	1972	Fisheries Act [A]	Fisheries Act	P	Exclusive fishing zone
British Virgin Islands	?	Protection of Trees and Conservation of Soil Ordinance [F]	National Park Trust	C	Protected forest
	1979	Marine Parks & Protected Areas Ordinance No. 8 [W]	Department of Conservation & Fisheries	T P	Marine park Protected area
	1961	National Parks Ordinance No. 29 [W]	National Park Trust	P	National park
	1959	Wild Birds Protection Ordinance [W]	?	P	Bird sanctuary
Cayman Islands	1976	Animals Law No. 8 (Grand Cayman) [W]	Natural Resources Unit	P	Animal sanctuary
	1980	Animals (Sanctuaries) Regulations (Cayman Brac) [W]	Natural Resources Unit	P	Animal sanctuary
	1982	Animals (Sanctuaries) Regulations (Little Cayman) [W]	Natural Resources Unit	P	Animal sanctuary
	1986	Marine Conservation (Marine Parks) Regulations [W]	Natural Resources Unit	T	Marine park
	?	Wild Life Conservation Act No. 27 [W]	Natural Resources Unit	P	Animal sanctuary

Cuba	1963	Resolución No. 412 [F]	Comisión Nacional de la Academia de Ciencias	T	Reservación natural (Patrimonio Nacional Forestal)
	1990	Decree Law No. 118 (Norma Técnica Cubana which provides area definitions) [W]	Ministerio de la Agricultura	P	Provides definition for the following:
	1981	Protección del Medio Ambiente y del Uso Racional de los Recursos Naturales Ley No. 33 [W]	Ministerio de la Cultura	P	Monumento nacional
			Ministerio de la Agricultura	P	Otras categorías
			Ministerio de la Agricultura	T	Parque nacional
			Ministerio de la Agricultura	P	Refugio de fauna
	1990	Decree Law No. 118 (Norma Técnica Cubana which provides area definitions) [W]	Ministerio de la Agricultura Academy of Sciences	P T	Refugio natural Reserva natural
Dominica			Ministero de la Agricultura	P	provides definition for the above
	1959	Forest Ordinance [F]	Division of Forestry and Wildlife	C T L	Forest reserve Prohibited area Protected forest
	1975	National Parks and Protected Areas Act [W]	Parks Service	T P	National park Protected area
	1976	Forestry and Wildlife Act [W]	Division of Forestry and Wildlife	P	Wildlife reserve
Dominican Republic	1928	Forest Law No. 944 [F]	General Directorate of Forestry	C	Restricted deforested area
	1974	Ley No. 67 que crea la Dirección Nacional de Parques [W]	Dirección Nacional de Parques	P P T P T	Carretera panorámica Monumento nacional Parque nacional Parque recreativo nacional Reserva científica natural

Grenada	1984	Forest, Soil and Water Conservation (Amendment) Ordinance No. 34 [F]	Department of Forestry	P	Protected area
	1906	Grand Etang Reserve Ordinance [W]	Department of Forestry	C	Forest reserve
	1967	National Trust Act [W]	National Trust and Historical Society		
	1986	Grenada Fisheries Act No. 15 [A]	Fisheries Division	P	Marine reserve
Guadeloupe (France)	1985	Forest Code 85-1273 [F]	Office National des Forêts	C	Forêt domaniale
	1987	Décret No. 87-981 portant création de la Réserve Naturelle du Grand Cul-de-Sac Marin [W]	Parc National de la Guadeloupe	P	Réserve naturelle du Cul-de-Sac Marin
	1960	Loi No. 60/708 relative à la création de parcs nationaux [W]	Direction de la Protection de la Nature, Ministère de l'Environnement	T	Parc national
	1976	Loi No. 76/629 relative à la protection de la nature [W]	Direction de la Protection de la Nature, Ministère de l'Environnement	P	Réserve naturelle
Haiti	1968	Décret de Parcs Nationaux et de Sites Naturels [W]	Ministère de l'Agriculture, des Ressources Naturelles et du Développement Rural	P P	Parc national Site naturel
	1955/ 1962	Loi de zones réservées [W]	Division of Natural Resources	L/C L	Forêt domaniale Zone sous protection

Jamaica	1937	Forest Act [F]		Forest & Soil Conservation Division	P	Forest reserve Protective area on private land
	1955	Beach Control Law No. 63 [W]		Natural Resources Conservation Division	P	Marine park
	1904	Morant and Pedro Cays Act [W]		Fisheries Division	T	
	1985	National Heritage Trust Act [W]		Office of the Prime Minister	P	Morant and Pedro Cays
	1945	Wildlife Protection Act [W]		Natural Resources Conservation Division	P	Protected national heritage site Protected national monument
	1975	Fisheries Industry Act [A]		Fisheries Division	P	Wildlife/game sanctuary/reserve Fish sanctuary
Martinique (France)	1967	Décret No. 67-158 relatif aux parcs naturels régionaux [F]		Office Nationale des Forêts	P	Parc naturel régional
	1985	Code Forestier 85-1273 [F]		Office Nationale des Forêts	C	Forêt domaniale
	1976	Loi No. 76/629 relative à la protection de la nature [W]		Directorate for Nature Conservation	T	Réserve naturelle
Montserrat (UK)	1956	Forest Ordinance [F]		Forestry Administration	P	Protected forest
	1970	Montserrat National Trust Ordinance [W]		National Trust	P	Reserve
Netherlands Antilles (Netherlands)	1985	Marine Environment Ordinance [W]		Netherlands Antilles National Parks Foundation	P	Marine park
					T	National park
					P	Underwater park

Puerto Rico (USA)	1891	Creative Act/Forest Reserve Act [F]	US Forest Service	C	National forest
	1975	Ley de Bosques No. 133 [F]	Puerto Rico Forest Service	P	Bosque estatal
	1972	Coastal Zone Management Act [W]	National Oceanic and Atmospheric Administration	P	National estuarine research reserve
	1972	Ley de Vida Silvestre No. 23 [W]	Department of Natural Resources	T	Wildlife refuge
	1972	Marine Protection, Research & Sanctuaries Act [W]	Secretary of Commerce	T	Natural reserve
	1966	National Refuge System Administration Act (Acts of Congress) [W]	US Fish and Wildlife Service	T	Natural area
St Lucia	1946	Forest, Soil & Water Conservation Act [F]	Ministry of Agriculture	T	National marine sanctuary
	1975	St Lucia National Trust Act [W]	St Lucia National Trust	P	Forest reserve
	1980	Wildlife Protection Act [W]	St Lucia National Trust	P	Reserve
	1984	Fisheries Act [A]	Fisheries Management Unit	P	Wildlife reserve
St Vincent & the Grenadines	1945	Forests Act [F]	Forestry Division	P	Marine reserve
	1987	Wildlife Protection Act [F]	Forestry Division	P	Forest reserve
	1986	Fisheries Act No. 8 [A]	Ministry of Trade, Industry & Agriculture	P	Wildlife reserve
					Marine reserve

St Christopher (St Kitts) & Nevis	1903	Forest Ordinance No. 10 [F]	Forestry Board	P C	Marine reserve Forest reserve
	1987	National Conservation and Environment Protection Act [W]	Ministry of Agriculture, Lands, Housing, Labour and Tourism	P P P	National park Nature reserve Protected area
	1984	Fisheries Act [A]	?	P	Marine Reserve
Trinidad & Tobago	1958	Conservation of Wildlife Ordinance No. 16 [F]	Forest Division	P	Wildlife (or game) sanctuary
	1950	Forest Ordinance [F]	Forest Division	C T	Forest reserve Forest reserve - prohibited area
	1970	Marine Areas (Preservation and Enhancement) Act [F]	Forest Division	P	Marine area
Turks and Caicos (UK)	1975	National Parks Ordinance [W]	National Parks Committee	P P P T	Area of historic interest National park Nature reserve Sanctuary
United States Virgin Islands (USA)	1961	Presidential Proclamation & Federal Organic Laws [W]	US National Park Service	P P	National park National monument
	1956	Public Law No. 925 and Federal Organic Act [W]	US Fish and Wildlife Service	P	National wildlife refuge
	1972	Marine Protection, Research and Sanctuaries Act [A]	US National Oceanic and Atmospheric Administration	P	National marine sanctuary

Table 12.2 Extent of notified natural forests, classified by forest function. Units are in sq. km, followed by % total area. Full data, with sources, are given in Annex 12.2.

Country SUBREGION	Total Area	F O R E S T F U N C T I O N			T o t a l
		Production	Protection	Conservation	
Anguilla	91	0	0	0	0
Antigua and Barbuda	440	38 (8.6)	0	0	38.0 (8.6)
Aruba	190	0	0	0	0
Bahamas	13,880	0	0	0	0
Barbados	430	0	0	0	0
Bermuda	50	0	0	0	0
British Virgin Islands	150	4 (2.7)	44 (29.7)	0	48 (32.3)
Cayman Islands	260	0	0	0	0
Cuba	110,860	6,598 (6.0)	7,204 (6.5)	6,383 (5.8)	20,185 (18.2)
Dominica	750	60 (8.0)	32 (4.2)	1 (0.05)	92 (12.3)
Dominican Republic	48,730	0	0	0	0
Grenada	340	17 (5.0)	0	0	17 (5.0)
Guadeloupe	1,710	35 (2.1)	85 (5.0)	0	120 (7.0)
Haiti	27,750	0	0	0	0
Jamaica	10,990	1,167 (10.6)	0	0	1,167 (10.6)
Martinique	1,100	49 (4.5)	48 (4.4)	5 (4.2)	102 (9.2)
Montserrat	100	0	0	0	0
Netherlands Antilles	990	0	0	0	0
Puerto Rico	8,900	0	0	356 (4.0)	356 (4.0)
St Lucia	620	26 (4.2)	45 (7.3)	66 (10.7)	137 (22.2)

St Vincent and the Grenadines	390	73 (18.7)	44 (11.3)	168 (43.1)	285 (73.1)
St Kitts and Nevis	360	0	0	0	0
Trinidad and Tobago	5,130	997 (19.4)	317 (6.2)	182 (3.5)	1,496 (29.2)
Turks and Caicos	430	0	0	0	0
US Virgin Islands	340	20 (5.9)	0	0	20 (5.9)
CARIBBEAN	234,981	9,083 (3.9)	7,819 (3.3)	7,176 (3.0)	24,063 (10.2)

Table 12.3 Extent of notified and proposed conservation areas, classified by sector and national designation. Management categories are assigned to designations based on national legislation (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses). Totals for proposed sites may be inflated because they may include areas of properties already protected but proposed for upgrading to higher conservation status. Details of individual properties are given in Annex 2. N is the total number of conservation areas.

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
ANGUILLA (91 sq. km)					
Wildlife Sector					
Marine Park	P	0	0	6	0 *
Tourism Management Area	P	0	0	2	0 *
Subtotals		0	0	8	0 *
(% total area)			(0.0)		(0.0)
Additional Sector, or sector unknown					
Fish Nursery Reserve	P	0	0	4	0 *
Subtotals		0	0	4	0 *
(% total area)			(0.0)		(0.0)
Totals		0	0	12	0 *
(% total area)			(0.0)		(0.0)
ANTIGUA AND BARBUDA (440 sq. km)					
Forest Sector					
Marine Park	P	2	2,500	0	0
Subtotals		2	2,500	0	0
(% total area)			(5.7)		(0.0)
Wildlife Sector					
National Park	P	3	4,128 *	0	0
Park Reserve	T	4	0 *	0	0
Wildlife Reserve	P	0	0	1	0 *
Subtotals		7	4,128 *	1	0 *
(% total area)			(9.4)		(0.0)
Totals		9	6,628 *	1	0 *
(% total area)			(15.1)		(0.0)
ARUBA (190 sq. km)					
Forest Sector					
Conservation Area	P	0	0	1	70
Subtotals		0	0	1	70
(% total area)			(0.0)		(0.4)
Wildlife Sector					
Bird Sanctuary	P	1	30	0	0
Subtotals		1	30	0	0
(% total area)			(0.2)		(0.0)
Totals		1	30	1	70
(% total area)			(0.2)		(0.4)
BAHAMAS (13,880 sq. km)					
Wildlife Sector					
National Park	P	9	121,604	0	0
Wild Bird Reserve	P	29	270 *	0	0

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Subtotals (% total area)		38	121,874 * (8.8)	0	0 (0.0)
Additional Sector, or sector unknown					
Managed Nature Reserve	P	1	1,813	0	0
Subtotals (% total area)		1	1,813 (0.1)	0	0 (0.0)
Totals (% total area)		39	123,687 * (8.9)	0	0 (0.0)
BARBADOS (430 sq. km)					
Wildlife Sector					
Marine Park	P	0	0	1	5,000
Marine Reserve	P	1	250	0	0
National Park	P	0	0	1	0 *
Nature Reserve	P	1	0 *	0	0
Private Reserve	P	1	0 *	0	0
Protected Area	P	1	0 *	0	0
Subtotals (% total area)		4	250 * (0.6)	2	5,000 * (11.6)
Additional Sector, or sector unknown					
Other area	P	0	0	1	20
Subtotals (% total area)		0	0 (0.0)	1	20 (0.0)
Totals (% total area)		4	250 * (0.6)	3	5,020 * (11.6)
BERMUDA (50 sq. km)					
Wildlife Sector					
Nature Reserve	P	12	51	0	0
Park	P	63	250 *	0	0
Preserve	P	2	12,530	0	0
Private Reserve	P	32	100 *	0	0
Subtotals (% total area)		109	12,931 * (258.6)	0	0 (0.0)
Totals (% total area)		109	12,931 * (258.6)	0	0 (0.0)
CAYMAN ISLANDS (260 sq. km)					
Wildlife Sector					
Ecological Zone	T	1	1,731	0	0
Marine Park	T	11	1,766	0	0
Nature Reserve	P	1	257	0	0
Replenishment Zone	T	12	4,876	0	0
Reserve	P	2	297	0	0
Sanctuary	P	4	166	0	0
Subtotals (% total area)		31	9,093 (35.0)	0	0 (0.0)
Additional Sector, or sector unknown					
Other area	P	1	24	0	0
Subtotals (% total area)		1	24 (0.1)	0	0 (0.0)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Totals (% total area)		32	9,117 (35.1)	0	0 (0.0)
CUBA (110,860 sq. km)					
Forest Sector					
National Forest	T	3	87,164 *	0	0
Subtotals (% total area)		3	87,164 * (0.8)	0	0 (0.0)
Wildlife Sector					
Faunal Refuge	P	5	59,359	4	80,150
Flora Reserve	P	2	6,038	8	21,567
Integrated Management Area	P	5	742,358	4	79,370
National Park	T	6	95,506	1	13,436
Natural Park	P	0	0	4	88,096
Natural Reserve	T	7	123,478	4	8,100
Other area	P	17	159,177 *	1	96
Subtotals (% total area)		42	1,185,916 * (10.7)	26	290,815 (2.6)
Additional Sector, or sector unknown					
Touristic Natural Area	P	2	50,610	11	83,448
Subtotals (% total area)		2	50,610 (0.5)	11	83,448 (0.8)
Totals (% total area)		47	1,323,690 * (12.0)	37	374,263 (3.4)
DOMINICA (750 sq. km)					
Forest Sector					
Forest Reserve	P	2	9,210	0	0
Subtotals (% total area)		2	9,210 (12.3)	0	0 (0.0)
Wildlife Sector					
National Park	T	2	7,403	1	2,497
Natural Monument	P	1	0 *	0	0
Wildlife Reserve	P	0	0	1	83
Subtotals (% total area)		3	7,403 * (9.9)	2	2,580 (3.4)
Totals (% total area)		5	16,613 * (22.2)	2	2,580 (3.4)
DOMINICAN REPUBLIC (48,730 sq. km)					
Wildlife Sector					
Bird Sanctuary	P	1	0 *	0	0
Cetacean Sanctuary	P	1	374,800	0	0
National Park	T	12	488,269	0	0
Other area	P	0	0	27	0 *
Scenic Route	P	1	41,000	0	0
Scientific Reserve	T	7	67,555	0	0
Subtotals (% total area)		22	971,624 * (19.9)	27	0 * (0.0)
Additional Sector, or sector unknown					
Archaeological Park	P	2	0 *	0	0
Subtotals (% total area)		2	0 * (0.0)	0	0 (0.0)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Totals		24	971,624 *	27	0 *
(% total area)			(19.9)		(0.0)
GRENADA (340 sq. km)					
Forest Sector					
Forest Reserve	P	1	618	0	0
National Park	P	0	0	4	2,004
Natural Landmark	P	0	0	10	76
Other area	P	0	0	2	0 *
Protected Seascape	P	0	0	10	1,209
Subtotals		1	618	26	3,289 *
(% total area)			(1.8)		(9.7)
Wildlife Sector					
Multiple Use Area	?	0	0	5	587
Subtotals		0	0	5	587
(% total area)			(0.0)		(1.7)
Totals		1	618	31	3,876 *
(% total area)			(1.8)		(11.4)
GUADELOUPE (1,710 sq. km)					
Wildlife Sector					
National Park	T	1	17,300	0	0
Nature Reserve	P	4	7,300 *	0	0
Other area	P	0	0	1	0 *
Pre-parc	P	1	16,200	0	0
Subtotals		6	40,800 *	1	0 *
(% total area)			(23.9)		(0.0)
Totals		6	40,800 *	1	0 *
(% total area)			(23.9)		(0.0)
HAITI (27,750 sq. km)					
Wildlife Sector					
Natural National Park	P	9	9,795 *	0	0
Subtotals		9	9,795 *	0	0
(% total area)			(0.4)		(0.0)
Totals		9	9,795 *	0	0
(% total area)			(0.4)		(0.0)
JAMAICA (10,990 sq. km)					
Forest Sector					
Forest Reserve	P	150	94,569 *	0	0
Subtotals		150	94,569 *	0	0
(% total area)			(8.6)		(0.0)
Wildlife Sector					
Game Reserve	P	4	337 *	2	295 *
Marine Park	P	3	1,530 *	6	0 *
National Park	P	0	0	9	80,635
Nature Reserve	P	0	0	7	81 *
Private Reserve	P	16	0 *	0	0
Wildlife Sanctuary	P	2	98	15	445 *
Subtotals		25	1,965 *	39	81,456 *
(% total area)			(0.1)		(7.3)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
<hr/>					
Additional Sector, or sector unknown					
Fisheries Sanctuary	P	2	0 *	12	0 *
Multiple Use Management Area	P	5	0 *	0	0
Other area	P	3	0 *	0	0
Subtotals		10	0 *	12	0 *
(% total area)			(0.0)		(0.0)
Totals		185	96,534 *	51	81,456 *
(% total area)			(8.7)		(7.3)
MARTINIQUE (1,100 sq. km)					
Forest Sector					
Regional Nature Park	P	1	70,150	0	0
Subtotals		1	70,150	0	0
(% total area)			(63.8)		(0.0)
Wildlife Sector					
Bird Reserve	P	1	5	0	0
Littoral Conservation Area	P	6	1,007	0	0
Nature Reserve	T	1	517	0	0
Subtotals		8	1,529	0	0
(% total area)			(1.4)		(0.0)
Additional Sector, or sector unknown					
Other area	P	0	0	3	1,800
Subtotals		0	0	3	1,800
(% total area)			(0.0)		(1.6)
Totals		9	71,679	3	1,800
(% total area)			(65.2)		(1.6)
MONTSERRAT (100 sq. km)					
Wildlife Sector					
Faunal Reserve	P	1	30	0	0
Private Reserve	P	1	6	0	0
Subtotals		2	36	0	0
(% total area)			(0.4)		(0.0)
Additional Sector, or sector unknown					
Other area	P	8	198 *	1	810
Subtotals		8	198 *	1	810
(% total area)			(2.0)		(8.1)
Totals		10	234 *	1	810
(% total area)			(2.4)		(8.1)
NETHERLANDS ANTILLES (990 sq. km)					
Wildlife Sector					
Marine Park	P	2	7,000	0	0
National Park	T	2	7,760	0	0
Private Reserve	P	1	55	0	0
Subtotals		5	14,815	0	0
(% total area)			(15.0)		(0.0)
Additional Sector, or sector unknown					
Underwater Park	P	1	1,036	0	0
Subtotals		1	1,036	0	0
(% total area)			(1.0)		(0.0)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Totals (% total area)		6	15,851 (16.0)	0	0 (0.0)
PUERTO RICO (8,900 sq. km)					
Forest Sector					
Commonwealth Forest	P	14	22,891	0	0
National Forest	P	1	11,340	0	0
Subtotals		15	34,231	0	0
(% total area)			(3.9)		(0.0)
Wildlife Sector					
National Estuarine Research	P	1	1,371	0	0
National Wildlife Refuge	T	4	1,341	1	0 *
Natural Area	T	8	1,805	0	0
Natural Reserve	T	4	6,742 *	0	0
Wildlife Refuge	T	2	1,263	0	0
Subtotals		19	12,522 *	1	0 *
(% total area)			(1.5)		(0.0)
Totals		34	46,753 *	1	0 *
(% total area)			(5.4)		(0.0)
SAINT KITTS AND NEVIS (360 sq. km)					
Wildlife Sector					
National Park	P	1	15	0	0
Other area	P	0	0	15	0 *
Subtotals		1	15	15	0 *
(% total area)			(0.0)		(0.0)
Totals		1	15	15	0 *
(% total area)			(0.0)		(0.0)
SAINT LUCIA (620 sq. km)					
Forest Sector					
Forest Reserve	T	15	7,496 *	0	0
Sanctuary	P	1	1,494	0	0
Subtotals		16	8,990 *	0	0
(% total area)			(14.5)		(0.0)
Wildlife Sector					
Nature Reserve	P	3	518	14	4 *
Other area	P	1	0 *	0	0
Reserve	P	2	121	0	0
Subtotals		6	639 *	14	4 *
(% total area)			(1.0)		(0.0)
Additional Sector, or sector unknown					
Marine Reserve	P	23	0 *	0	0
National Historic Park	P	1	20	0	0
Subtotals		24	20 *	0	0
(% total area)			(0.0)		(0.0)
Totals		46	9,649 *	14	4 *
(% total area)			(15.5)		(0.0)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
SAINT VINCENT AND THE GRENADINES (390 sq. km)					
Forest Sector					
Forest Reserve	P	3	0 *	0	0
Reserve	P	1	4,399	0	0
Wildlife Reserve	P	23	0 *	1	0 *
Subtotals		27	4,399 *	1	0 *
(% total area)			(11.3)		(0.0)
Wildlife Sector					
National Park	P	0	0	1	3,885
Other area	P	0	0	4	0 *
Subtotals		0	0	5	3,885 *
(% total area)			(0.0)		(10.0)
Additional Sector, or sector unknown					
Marine Reserve	P	1	3,885	0	0
Recreation Area	P	0	0	5	0 *
Subtotals		1	3,885	5	0 *
(% total area)			(10.0)		(0.0)
Totals		28	8,284 *	11	3,885 *
(% total area)			(21.3)		(10.0)
TRINIDAD AND TOBAGO (5,130 sq. km)					
Forest Sector					
Game Sanctuary	P	14	17,624	0	0
National Park	P	0	0	8	37,700
Natural Landmark	P	0	0	8	3,546
Prohibited Area	T	2	2,000	0	0
Recreation Park	P	0	0	13	1,931
Scenic Landscape	P	0	0	5	3,290
Scientific Reserve	P	0	0	13	6,283
Subtotals		16	19,624	47	52,750
(% total area)			(3.8)		(10.2)
Wildlife Sector					
Nature Conservation Reserve	P	0	0	13	16,500
Nature Reserve	P	1	650	10	652
Subtotals		1	650	23	17,152
(% total area)			(0.1)		(3.3)
Totals		17	20,274	70	69,902
(% total area)			(3.9)		(13.5)
TURKS AND CAICOS (430 sq. km)					
Wildlife Sector					
Area of Historical Interest	P	7	350 *	0	0
National Park	P	12	11,060	0	0
Nature Reserve	P	10	5,933	0	0
Other area	P	1	0 *	0	0
Sanctuary	P	4	264	0	0
Subtotals		34	17,607 *	0	0
(% total area)			(40.9)		(0.0)
Totals		34	17,607 *	0	0
(% total area)			(40.9)		(0.0)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)

VIRGIN ISLANDS (BRITISH) (150 sq. km)					
Forest Sector					
Forest Park	P	2	144	0	0
Subtotals		2	144	0	0
(% total area)			(1.0)		(0.0)
Wildlife Sector					
Bird Sanctuary	P	20	1,571 *	0	0
Marine Park	T	1	324	0	0
National Park	P	0	0	4	13,740
Natural Monument	P	1	3	2	595
Other area	P	5	62	2	260
Park	P	5	113	0	0
Protected Area	T	1	0 *	3	3,300
Subtotals		33	2,073 *	11	17,895
(% total area)			(13.9)		(119.3)
Totals		35	2,217 *	11	17,895
(% total area)			(14.9)		(119.3)
VIRGIN ISLANDS (US) (340 sq. km)					
Forest Sector					
National Wildlife Refuge	P	3	164	0	0
Subtotals		3	164	0	0
(% total area)			(0.5)		(0.0)
Wildlife Sector					
National Historic Site	P	1	0 *	0	0
National Monument	P	1	356	0	0
National Park	P	1	14,079	0	0
Subtotals		3	14,435 *	0	0
(% total area)			(42.4)		(0.0)
Additional Sector, or sector unknown					
Protected Area	P	0	0	1	1,000
Subtotals		0	0	1	1,000
(% total area)			(0.0)		(2.9)
Totals		6	14,599 *	1	1,000
(% total area)			(42.9)		(2.9)
CARIBBEAN (234,981 sq. km) - summary by sector					
Forestry Sector		238	331,763 *	75	56,109 *
(% total area)			(1.4)		(0.2)
Wildlife Sector		409	2,430,130 *	180	419,374 *
(% total area)			(10.3)		(1.8)
Additional Sector or sector unknown		50	57,586 *	38	87,078 *
(% total area)			(0.2)		(0.4)
CARIBBEAN (234,981 sq. km) - summary by management category					
Total protection		106	924,296 *	10	27,333 *
(% total area)			(3.9)		(0.1)

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Partial protection		591	1,895,183 *	278	534,641 *
(% total area)			(8.1)		(2.3)
Degree of protection unknown		0	0	5	587
(% total area)			(0.0)		(0.0)
Totals		697	2,819,479 *	293	562,561 *
(% total area)			(12.0)		(2.4)

* Subtotal is incomplete because of missing data for either number of sites or area covered.

Table 12.4(a) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
a) Forestry Sector							
ANTIGUA AND BARBUDA							
Notified sites	P	2	1,250	1	1	0	0
	Total	2	1,250	1	1	0	0
ARUBA							
Proposed sites	P	1	70	1	0	0	0
	Total	1	70	1	0	0	0
CUBA							
Notified sites	T	2	43,582	0	1	1	0
	Total	2	43,582	0	1	1	0
DOMINICA							
Notified sites	P	2	4,605	1	1	0	0
	Total	2	4,605	1	1	0	0
GRENADA							
Notified sites	P	1	618	1	0	0	0
	Total	1	618	1	0	0	0
Proposed sites	P	24	137	24	0	0	0
	Total	24	137	24	0	0	0
JAMAICA							
Notified sites	P	124	762	118	4	2	0
	Total	124	762	118	4	2	0
MARTINIQUE							
Notified sites	P	1	70,150	0	0	1	0
	Total	1	70,150	0	0	1	0
PUERTO RICO							
Notified sites	P	15	2,282	7	7	1	0
	Total	15	2,282	7	7	1	0
SAINT LUCIA							
Notified sites	T	14	535	10	4	0	0
	P	1	1,494	0	1	0	0
	Total	15	599	10	5	0	0
SAINT VINCENT AND THE GRENADINES							
Notified sites	P	1	4,399	0	1	0	0
	Total	1	4,399	0	1	0	0

COUNTRY		N	Man. size (ha)	Notified		Proposed	
				≤1000	1001- 10,000	10001- 100,000	>100,000
a) Forestry Sector							
TRINIDAD AND TOBAGO							
Notified sites	T	2	1,000	1	1	0	0
	P	14	1,258	9	5	0	0
	Total	16	1,226	10	6	0	0
Proposed sites	P	47	1,122	34	13	0	0
	Total	47	1,122	34	13	0	0
VIRGIN ISLANDS (BRITISH)							
Notified sites	P	2	72	2	0	0	0
	Total	2	72	2	0	0	0
VIRGIN ISLANDS (U.S.)							
Notified sites	P	3	54	3	0	0	0
	Total	3	54	3	0	0	0
CARIBBEAN							
Notified sites	T	18	5,370	11	6	1	0
	P	166	1,416	142	20	4	0
	Total	184	1,803	153	26	5	0
Proposed sites	P	72	779	59	13	0	0
	Total	72	779	59	13	0	0

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 12.4(b) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
b) Wildlife Sector							
ANTIGUA AND BARBUDA							
Notified sites	P	1	4,128	0	1	0	0
	Total	1	4,128	0	1	0	0
ARUBA							
Notified sites	P	1	30	1	0	0	0
	Total	1	30	1	0	0	0
BAHAMAS							
Notified sites	P	11	11,079	9	0	2	0
	Total	11	11,079	9	0	2	0
BARBADOS							
Notified sites	P	1	250	1	0	0	0
	Total	1	250	1	0	0	0
Proposed sites	P	1	5,000	0	1	0	0
	Total	1	5,000	0	1	0	0
BERMUDA							
Notified sites	P	103	125	102	0	1	0
	Total	103	125	102	0	1	0
CAYMAN ISLANDS							
Notified sites	T	24	348	22	2	0	0
	P	7	102	7	0	0	0
	Total	31	293	29	2	0	0
CUBA							
Notified sites	T	13	16,844	0	6	7	0
	P	27	35,812	3	15	7	2
	Total	40	29,647	3	21	14	2
Proposed sites	T	5	4,307	0	4	1	0
	P	21	12,822	5	11	5	0
	Total	26	11,185	5	15	6	0
DOMINICA							
Notified sites	T	2	3,701	1	1	0	0
	Total	2	3,701	1	1	0	0
Proposed sites	T	1	2,497	0	1	0	0
	Total	1	2,497	0	1	0	0

COUNTRY		N	Man. size (ha)	Notified		Proposed	
				≤1000	1001- 10,000	10001- 100,000	>100,000
b) Wildlife Sector							
DOMINICAN REPUBLIC							
Notified sites	T	19	29,253	3	7	8	1
	P	2	207,900	0	0	1	1
	Total	21	46,267	3	7	9	2
GRENADA							
Proposed sites	?	5	117	5	0	0	0
	Total	5	117	5	0	0	0
GUADELOUPE							
Notified sites	T	1	17,300	0	0	1	0
	P	4	5,875	1	2	1	0
	Total	5	8,160	1	2	2	0
HAITI							
Notified sites	P	8	1,224	5	3	0	0
	Total	8	1,224	5	3	0	0
JAMAICA							
Notified sites	P	6	327	5	1	0	0
	Total	6	327	5	1	0	0
Proposed sites	P	12	6,788	5	5	2	0
	Total	12	6,788	5	5	2	0
MARTINIQUE							
Notified sites	T	1	517	1	0	0	0
	P	7	144	7	0	0	0
	Total	8	191	8	0	0	0
MONTSERRAT							
Notified sites	P	2	18	2	0	0	0
	Total	2	18	2	0	0	0
NETHERLANDS ANTILLES							
Notified sites	T	2	3,880	0	2	0	0
	P	3	2,351	2	1	0	0
	Total	5	2,963	2	3	0	0
PUERTO RICO							
Notified sites	T	17	655	15	2	0	0
	P	1	1,371	0	1	0	0
	Total	18	695	15	3	0	0
SAINT KITTS AND NEVIS							
Notified sites	P	1	15	1	0	0	0
	Total	1	15	1	0	0	0
SAINT LUCIA							
Notified sites	P	5	127	5	0	0	0
	Total	5	127	5	0	0	0

COUNTRY		N	Man. size (ha)	Notified		Proposed	
b) Wildlife Sector				≤1000	1001- 10,000	10001- 100,000	>100,000
Proposed sites	P	4	1	4	0	0	0
	Total	4	1	4	0	0	0
SAINT VINCENT AND THE GRENADINES							
Proposed sites	P	1	3,885	0	1	0	0
	Total	1	3,885	0	1	0	0
TRINIDAD AND TOBAGO							
Notified sites	P	1	650	1	0	0	0
	Total	1	650	1	0	0	0
Proposed sites	P	23	745	17	6	0	0
	Total	23	745	17	6	0	0
TURKS AND CAICOS							
Notified sites	P	32	550	26	6	0	0
	Total	32	550	26	6	0	0
VIRGIN ISLANDS (BRITISH)							
Notified sites	T	1	324	1	0	0	0
	P	30	58	30	0	0	0
	Total	31	66	31	0	0	0
Proposed sites	T	3	1,100	2	1	0	0
	P	8	1,824	6	2	0	0
	Total	11	1,626	8	3	0	0
VIRGIN ISLANDS (US)							
Notified sites	P	2	7,217	1	0	1	0
	Total	2	7,217	1	0	1	0
CARIBBEAN							
Notified sites	T	80	10,345	43	20	16	1
	P	255	6,284	209	30	13	3
	Total	335	7,254	252	50	29	4
Proposed sites	T	9	3,037	2	6	1	0
	P	70	5,591	37	26	7	0
	?	5	117	5	0	0	0
	Total	84	4,991	44	32	8	0

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 12.4(c) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

c) Additional Sector(s)		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
Proposed sites	P	1	83	1	0	0	0
	Total	1	83	1	0	0	0
BAHAMAS							
Notified sites	P	1	1,813	0	1	0	0
	Total	1	1,813	0	1	0	0
BARBADOS							
Proposed sites	P	1	20	1	0	0	0
	Total	1	20	1	0	0	0
CAYMAN ISLANDS							
Notified sites	P	1	24	1	0	0	0
	Total	1	24	1	0	0	0
CUBA							
Notified sites	P	2	25,305	0	0	2	0
	Total	2	25,305	0	0	2	0
Proposed sites	P	11	7,586	0	9	2	0
	Total	11	7,586	0	9	2	0
MARTINIQUE							
Proposed sites	P	3	600	3	0	0	0
	Total	3	600	3	0	0	0
MONTSERRAT							
Notified sites	P	5	39	5	0	0	0
	Total	5	39	5	0	0	0
Proposed sites	P	1	810	1	0	0	0
	Total	1	810	1	0	0	0
NETHERLANDS ANTILLES							
Notified sites	P	1	1,036	0	1	0	0
	Total	1	1,036	0	1	0	0
SAINT LUCIA							
Notified sites	P	1	20	1	0	0	0
	Total	1	20	1	0	0	0
SAINT VINCENT AND THE GRENADINES							
Notified sites	P	1	3,885	0	1	0	0
	Total	1	3,885	0	1	0	0

COUNTRY		N	Man. size (ha)	Notified		Proposed	
c) Additional Sector(s)				≤1000	1001- 10,000	10001- 100,000	>100,000
VIRGIN ISLANDS (US)							
Proposed sites	P	1	1,000	1	0	0	0
	Total	1	1,000	1	0	0	0
CARIBBEAN							
Notified sites	P	12	4,798	7	3	2	0
	Total	12	4,798	7	3	2	0
Proposed sites	P	17	5,122	6	9	2	0
	?	1	83	1	0	0	0
	Total	18	4,842	7	9	2	0

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 12.5 State parties to international (and regional) conventions or programmes concerning the conservation of natural areas, together with the number of properties (natural of mixed natural/cultural in the case of the World Heritage Convention) recognised under respective conventions in brackets.

	World Heritage Convention	Biosphere Reserves ¹	Ramsar Convention	Cartagena Convention
Anguilla	1984 (0)	-	1990 (0)	-
Antigua and Barbuda	1983 (0)	-	-	1986
Aruba	-	-	-	1984
Bahamas	-	-	-	-
Barbados	-	-	-	1985
Bermuda	1984 (0)	-	-	-
British Virgin Islands	1984 (0)	-	1976 (0)	1986
Cayman Islands	1984 (0)	-	1976 (0)	1986
Cuba	1981 (0)	1984 (4)	-	1988
Dominica	-	-	-	-
Dominican Republic	1985 (0)	-	-	-
Grenada	-	-	-	1985
Guadeloupe	-	-	-	1985
Haiti	1980 (0)	-	-	-
Jamaica	1983 (0)	-	-	1987
Martinique	-	-	-	1985
Montserrat	1984 (0)	-	1976 (0)	-
Netherlands Antilles	-	-	1980 (6)	1984
Puerto Rico	1973 (0)	1976 (1)	1986 (0)	-
St Lucia	-	-	-	1984
St Vincent & the Grenadines	-	-	-	1990
St Christopher & Nevis	1986 (0)	-	-	-

Trinidad & Tobago	-	-	-	1986
Turks & Caicos Islands	1984 (0)	-	1976 (0)	1986
United States Virgin Islands	1973 (0)	1976 (1)	1986 (0)	1984

Table 12.6 Summary of national priorities for action relating to conservation areas.

COUNTRY	Legislation	Completing the network	Managing the network
Anguilla	Enact legislation relating to terrestrial habitats	Comprehensively review terrestrial network	Develop structure of environmental department
Antigua & Barbuda	Enact draft wildlife acts	Complete conservation area network coverage	Clearly define administration responsibilities
Aruba	Enact conservation legislation	Comprehensively review network	Strengthen Aruban Foundation for Nature and Parks
Bahamas	Enact laws ensuring protection of terrestrial habitats	Implement the conservation area network proposals in the "Development of a National Parks System" and the National Conservation Strategy of 1984	Strengthen authority responsible for wild bird reserves
Barbados	Enact legislation protecting terrestrial habitats as indicated under the National Development Plan 1988-93	Implement the national park recommendations under the National Conservation Strategy	Promote commitment under the National Development plan 1988-93. Increase financial aid for management
Bermuda	Strengthen legislation		Continue to strengthen and undertake revision of conservation areas
British Virgin Islands	Strengthen conservation area regulations	Create proposed conservation areas	Continue to strengthen the National Parks Trust
Cayman Islands	Enact habitat protection legislation	Increase protection of coastal woodlands and mangrove	Complete revision of integrated development plans
Cuba	Strengthen legislation, clarifying definitions of each designation	Extend network to include coastal areas	Enlarge size of conservation areas and increase level of protection

Dominica	Review recommendations of the Law Revision Committee under the 1986 Act	Protection for Mome Diablotin Natural Park	Restrict agricultural damage within conservation areas
Dominican Republic		Comprehensively review network	Implement constitutional provision for natural resource protection - implement and clarify legislation. Improve administration effectiveness by increased coordination
Grenada	Strengthen legislation for conservation areas	Establish available conservation area network as a priority	Implement and strengthen manpower in the National Park and Wildlife Unit
Guadeloupe		Extend the network to conserve coral reefs. Create the three proposed nature reserves	Ensure coordination of the Office Nationale des Forêts and other public organisations
Haiti	Implement National Conservation Strategy of 1987 with recommendations for the promulgation of appropriate and adequate conservation legislation	Comprehensively review network	Implement National Conservation Strategy recommendations for the creation of an independent governmental conservation agency. Improve management effectiveness of protected areas
Jamaica	Update conservation legislation	Implement "Towards a national park system for Jamaica" (1981) and Natural Physical Plan (1978 -1998)	Resolve cash-flow problems
Martinique		Extend the network of conservation areas to all coastal areas	Strengthen conservation management
Montserrat	Enact and Implement legislation, especially the draft Forestry & Wildlife Ordinance	Establish a network	Create an administration
Netherlands Antilles	Enact legislation following decentralisation	Implement existing conservation systems plans	Create bi-national management committee for Deux Frères-Belvedere

Puerto Rico		Establish network of marine sanctuaries	Increase coordination
St Kitts & Nevis	Notify existing forest conservation reserves	Follow recommendations of Caribbean Conservation Foundation environmental profile to develop conservation areas network	Resolve management problems
St Lucia		Comprehensively establish representative network under the auspices of the St Lucia National Trust	Implement new ordinance of Land Conservation Board. Implement comprehensive management plan for conservation of forests
St Vincent & the Grenadines	Implement the Forest Conservation Act and enact legislation for national parks	Comprehensively review network and implement recommendations	Implement Forest Conservation Act. Implement recommendation to establish single coordination agency
Trinidad & Tobago	Strengthen legislation by preventing mining, extensive logging and illegal land occupation	Establish proposed network of the Forestry/Organisation of American States (OAS) project	Strengthen management
Turks & Caicos Islands	Enact legislation on setting up a National Trust	Establish representative network based on existing reviews	Strengthen management
Virgin Islands (US)		Establish and implement results of 1991 systems analysis	Promote coordinated activities

Annex 12.1 List of conservation areas. Locations of most notified conservation areas are shown in the accompanying maps in Part III

ANGUILLA		
Proposed (Fish Nursery Reserves)		
Anguillita Island		
Blowing Point		
Corito Bay		
Little Bay		
Subtotal	4 sites	ha*
Proposed (Marine Parks)		
Crocus Bay		
Dog Island		
Sandy Island proposed		
Seal Island and Prickly Pear Cay East		
Shoal Bay		
Sombrero Island		
Subtotal	6 sites	ha*
Proposed (Tourism Management Area)		
D		
Scrub Island		
Subtotal	2 sites	ha*
Totals		
Existing conservation areas	0 sites	ha
Proposed conservation areas	12 sites	ha*

* Subtotal is incomplete because of missing data.

ANTIGUA AND BARBUDA

Marine Parks

1 Palaster Reef		500	1973
2 Salt Fish Tail Reef (Diamond Reef)		2,000	1973
Subtotal	2 sites	2,500	ha

National Parks

3 Betty's Hope			
4 Half Moon Bay			
5 Nelson's Dockyard		4,128	1984
Subtotal	3 sites	4,128	ha*

Parks Reserves

6 Devil's Bridge			
7 Fort James			
8 Green Island Reefs			
9 Northeast Archipelago			
Subtotal	4 sites		ha*

Proposed (Wildlife Reserve)

Wallings Woodlands			
Subtotal	1 site		ha*

Totals

Existing conservation areas	9 sites	6,628	ha*
Proposed conservation areas	1 site		ha*

* Subtotal is incomplete because of missing data.

ARUBA

Bird Sanctuary			
1 Bubali Pond Bird Sanctuary		30	
Subtotal	1 site	30 ha	
Proposed (Conservation Area)			
Het Spaans Lagoon Proposed		70	1980
Subtotal	1 site	70 ha	
Totals			
Existing conservation areas	1 site	30 ha	
Proposed conservation areas	1 site	70 ha	

BAHAMAS

Managed Nature Reserve

1 Union Creek (within Inagua NP)		1,813	1965
Subtotal	1 site	1,813 ha	

National Parks

2 Black Sound Cay		1	1988
3 Conception Island		809	1973
4 Exuma Cays Land and Sea Park		45,584	1958
5 Inagua		74,333	1965
6 Lucayan		16	1982
7 Pelican Cays Land and Sea Park		850	1981
8 Peterson Cay		1	1971
9 The Retreat (Botanical Gardens)		5	1978
10 Tilloo Cay		5	1990
Subtotal	9 sites	121,604 ha	

Wild Bird Reserves

11 A Rock off Hog Cay			1962
12 A Rock in the Exuma Cays			
13 Adelaide Creek			
14 Betty Cay			1951
15 Big Derby Island			1951
16 Big Galliot Cay			1954
17 Bottle Cay			1961
18 Cedar Cay			
19 Channel Cays and Flat Cay			1954
20 Cistern Cay			1958
21 Finley Cay			
22 Goat Cay			1951
23 Goulding Cay WNR			
24 Grassy Creek Cays and Rocks			1954
25 Guana Cay			1951
26 Harvey Cay			
27 High Cay			1954
28 Lake Cunningham		70	
29 Lightbourn Creek (Waterloo)		200	
30 Little Derby Island			1951
31 Little San Salvador (Little Island)			1961
32 Mammy Rhoda Cay			1955
33 North Rocks and Small Rocks			
34 Paradise Island			1956
35 Pigeon Cay			1956
36 Rocks in the Vicinity of Leaf Cay			
37 Washerwomans Cut Cays			1954
38 Water Cay and Schooner Cays			
39 Wood Cay			1955
Subtotal	29 sites	270 ha*	

Totals

Existing conservation areas	39 sites	123,687 ha*
Proposed conservation areas	0 sites	ha

* Subtotal is incomplete because of missing data.

BARBADOS

Marine Reserve			
1 Barbados		250	1980
Subtotal	1 site	250 ha	
Nature Reserve			
2 Turner's Hall Woods			
Subtotal	1 site	ha*	
Private Reserve			
3 Welchman Hall Gully			1962
Subtotal	1 site	ha*	
Protected Area			
4 Harrison's Cave			
Subtotal	1 site	ha*	
Proposed (Marine Park)			
Northeast Coast		5,000	
Subtotal	1 site	5,000 ha	
Proposed (National Park)			
Barbados National Park			
Subtotal	1 site	ha*	
Proposed (Other area)			
Graeme Hall Swamp Reserve		20	
Subtotal	1 site	20 ha	
Totals			
Existing conservation areas	4 sites	250 ha*	
Proposed conservation areas	3 sites	5,020 ha*	

* Subtotal is incomplete because of missing data.

BERMUDA

Nature Reserves

1 Castle Harbour Islands	13	1979
2 Daniel's Island	1	
3 Evan's Pond	1	
4 Godet's Island	1	
5 Godet's Rock	1	
6 Hungry Bay	3	
7 Lovers Lake	2	1980
8 Pembroke Marsh	8	
9 Shelly Bay Marsh	2	1970
10 Spittal Pond	14	1979
11 Summerhaven	1	
12 Winterhaven	4	
Subtotal	51	ha

12 sites

Parks

13 Achilles Bay	1	
14 Admiralty House	7	
15 Alexandra's Battery	1	
16 Astwood	9	
17 Avocado Lodge	1	
18 Blue Hole Hill	1	
19 Botanical Gardens	14	
20 Breman Island	1	
21 Burchall Cove	1	
22 Burt Island	3	
23 Church Bay	4	
24 Coney Island	6	
25 Crawl Waterfront	1	
26 Crow Lane	1	
27 Daniel's Head Beach	1	
28 Devon Spring	1	
29 Devonshire Bay	2	
30 Duck's Puddle	1	
31 Elbow Beach	1	
32 Ferry Point	14	
33 Ferry Point P#	14	
34 Friendship Vale	1	
35 Garthowen	1	
36 Gates Fort	1	
37 Gibbs Hill L.H.	2	
38 Gilbert	1	
39 Governor's Island	1	
40 Great Head	10	
41 Happy Valley	3	
42 Hen Island	1	
43 Higgs Island	2	
44 Hog Bay	4	
45 Horseshoe Island	1	
46 John Smith Bay	1	
47 Kindley Field	4	
48 Kindley Field P#	1	
49 Kindley Field P##	1	
50 Little Head	9	
51 Mangrove Bay	1	
52 Mill Creek	1	
53 Mullet Bay	1	
54 Nelly Island	4	
55 Orange Valley	3	
56 Paget Island	13	
57 Palmetto	7	
58 Peggy's Island	1	
59 Penhurst	6	
60 Robinson Bay	1	
61 Rocky Hill	2	

62 Scaur Hill Fort		9	
63 Shelly Bay Beach		1	
64 Smith's Island		8	
65 Somerset Long Bay		1	
66 South Shore		38	
67 Spanish Point		3	
68 St. David's L.H.		3	
69 The Arboretum		8	
70 Tobacco Bay			
71 Tulo Valley Nursery		2	
72 Warwick Ridge		1	
73 Watch Hill		3	
74 West Whale Bay		3	
75 Wilkinson Avenue		1	
Subtotal	63 sites	250	ha*
Preserves			
76 North Shore Coral Reef Pr		12,000	1966
77 South Shore Coral Reef Pr		530	
Subtotal	2 sites	12,530	ha
Private Reserves			
78 Butterfield (BNT)			
79 Devonshire Marsh (BNT)		4	
80 Evans Bay			1981
81 Firefly (BAS)		1	
82 Freer Cox (BAS)		3	
83 Gibbons (BNT)		1	
84 Gladys Morrell (BNT)		1	
85 Great Sound			1976
86 H.T. North (BNT)		2	
87 Hamilton Harbour			1976
88 Harrington Sound			1976
89 Heydon Trust		16	
90 I.W. Hughes (BNT)		1	
91 Lambda Island (BAS)		1	
92 Mangrove Lake		12	
93 Morgan and Palm Island (BNT)		2	
94 Paget Marsh (BAS)		3	
95 Paget Marsh (BNT)		11	
96 Pearl Island (BAS)		1	
97 Rabbit Island (BNT)		1	
98 Rogue Island (BNT)		1	
99 Saltus Island (BNT)		1	
100 Sears Cave (BAS)		1	
101 Seymour's Pond (BAS)		1	
102 Somerset Long Bay (BAS)		1	
103 Spittal Pond (BNT)		14	
104 Springfield-Gilbert (BNT)		3	
105 Stokes Point (BAS)		1	
106 Walsingham		9	
107 Warwick Pond (BNT)		4	
108 Watlington (BAS)		3	
109 Wilkinson (BNT)		1	
Subtotal	32 sites	100	ha*
Totals			
Existing conservation areas	109 sites	12,931	ha*
Proposed conservation areas	0 sites		ha

* Subtotal is incomplete because of missing data.

BRITISH VIRGIN ISLANDS

Bird Sanctuaries

1 Cockroach Island	1	1959
2 Cooper Island	138	1959
3 Deadman's Chest Island	14	1959
4 Fallen Jerusalem Island	12	1959
5 Flamingo Pond	449	1977
6 George Dog Island	15	1959
7 Ginger Island	105	1959
8 Great Dog Island	33	1959
9 Great Tobago Island	89	1959
10 Little Dog Island	13	1959
11 Little Tobago Island	22	1959
12 Mosquito Island	50	1959
13 Necker Island	30	1959
14 Peter Island	430	1959
15 Prickly Pear Island	70	1959
16 Round Rock Island	8	1959
17 Saba Island		1959
18 Salt Island	78	1959
19 St. Eustatia	11	1959
20 The Seal Dogs	3	1959
Subtotal	20 sites	1,571 ha*

Forest Parks

21 Sage Mountain	37	1964
22 Virgin Gorda Peak	107	1974
Subtotal	2 sites	144 ha

Marine Park

23 Wreck of the Rhone	324	1980
Subtotal	1 site	324 ha

Natural Monument

24 The Baths	3	1990
Subtotal	1 site	3 ha

Other areas

25 Dead Chest	14	1977
26 Devil's and Spring Bay	25	1964
27 Fallen Jerusalem	12	1974
28 Mt. Healthy/Windmill	1	1983
29 West Dog Island	10	1974
Subtotal	5 sites	62 ha

Parks

30 Botanic Gardens	1	1979
31 Diamond Cay, Jost van Dyke	1	1991
32 Fort Point	15	1978
33 Prickly Pear	95	1988
34 Queen Elizabeth II	1	1974
Subtotal	5 sites	113 ha

Protected Area

35 Horseshoe Reef		1990
Subtotal	1 site	ha*

Proposed (National Parks)

Anegada Island	9,100
Norman Island	390
North Sound	3,800
Sandy Cay	450
Subtotal	4 sites 13,740 ha

Proposed (Natural Monuments)

Beef Island	145
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Little Jost Van Dyke		450
Subtotal	2 sites	595 ha
Proposed (Other areas)		
Great Comanoe		140
Guana Island		120
Subtotal	2 sites	260 ha
Proposed (Protected Areas)		
Cane Garden Bay		500
The Dogs		2,000
The Tobagos		800
Subtotal	3 sites	3,300 ha
Totals		
Existing conservation areas	35 sites	2,217 ha*
Proposed conservation areas	11 sites	17,895 ha

* Subtotal is incomplete because of missing data.

CAYMAN ISLANDS

Ecological Zone

1 Little Sound (Grand Cayman)		1,731	1986
Subtotal	1 site	1,731 ha	

Marine Parks

2 Bloody Bay - Jackson Point		161	1986
3 Bowse Bluff - Rum Point		60	1986
4 Dick Sessingers Bay - Beach Point		143	1986
5 Jennifer Bay - Deep Well		61	1986
6 North West Point - West Bay Cemetery		155	1986
7 Preston Bay - Main Channel (Little Cayman)		81	1986
8 Radio Mast - Sand Bluff		177	1986
9 Scotts Anchorage - White Bay		56	1986
10 Spanish Cove Resort - Jetty (Grand Cayman)		8	1986
11 Spotter Bay - Anchors Point		63	1986
12 Victoria House - Sand Cay Apartments		801	1986
Subtotal	11 sites	1,766 ha	

Nature Reserve

13 Salinas		257	1989
Subtotal	1 site	257 ha	

Other area

14 Botanic Garden		24	
Subtotal	1 site	24 ha	

Replenishment Zones

15 Bats Cave Beach (Grand Cayman)		31	1986
16 Cayman Dive Lodge		4	1986
17 Coral Isle Club		1	1986
18 Frank Sound (Grand Cayman)		224	1986
19 Head of Barkers - Flats		365	1986
20 Mary's Bay - East Point		180	1986
21 North Sound (Grand Cayman)		3,310	1986
22 Salt Water Point - Beach Point (Cayman Brac)		26	1986
23 South Hole Sound (Little Cayman)		316	1986
24 South Sound (Grand Cayman)		317	1986
25 Spott Bay		33	1986
26 West Bay Cemetery - Victoria House		69	1986
Subtotal	12 sites	4,876 ha	

Reserves

27 Brac Parrot (Cayman Brac)		40	1991
28 Salina (Grand Cayman)		257	1989
Subtotal	2 sites	297 ha	

Sanctuaries

29 Booby Pond and the Rookery (Little Cayman)		72	1982
30 Colliers Bay Pond (Grand Cayman)		32	1976
31 Meagre Bay Pond (Grand Cayman)		38	1976
32 Salt Water Pond (Cayman Brac)		24	1980
Subtotal	4 sites	166 ha	

Totals

Existing conservation areas	32 sites	9,117 ha	
Proposed conservation areas	0 sites	ha	

CUBA

Faunal Refuges

1 Cayo Cantiles	3,800	1986
2 Hatibonico	5,220	1980
3 Las Salinas	31,800	1936
4 Ojito de Agua	3,739	1987
5 Santo Tomas	14,800	1936
Subtotal	5 sites	59,359 ha

Flora Reserves

6 El Toldo Managed	5,638	1987
7 Mogotes de Jumagua Managed	400	1986
Subtotal	2 sites	6,038 ha

Integrated Management Areas

8 Cubanacan	7,164	1986
9 Escambray	187,000	1986
10 Gran Parque Sierra Maestra	527,000	1980
11 Mil Cumbres	16,634	1986
12 Sierra del Chorrillo	4,560	1986
Subtotal	5 sites	742,358 ha

National Forests

13 Cienaga de Zapata		
14 Cubanacan	7,164	1986
15 Sur de la Isla	80,000	
Subtotal	3 sites	87,164 ha*

National Parks

16 Desembarco del Granma	25,764	1980
17 Gran Piedra	3,354	1980
18 La Bayamesa	16,500	1980
19 Pico Cristal	15,000	1930
20 Punta Frances - Punta Pederales Marine	17,424	1985
21 Turquino	17,464	1959
Subtotal	6 sites	95,506 ha

Natural Reserves

22 Alto de Iberia	5,673	1987
23 Cabo Corrientes	1,578	1963
24 Cayo Caguanes/Cayos de Piedra	1,500	1966
25 Cayo Romano	92,000	1986
26 Cupeyal del Norte	10,260	1980
27 El Veral	7,535	1963
28 Jaguani	4,932	1963
Subtotal	7 sites	123,478 ha

Other areas

29 Baitiquiri	1,900	
30 Cayo Cinco Lenguas		
31 Cayo Guajaba	9,168	
32 Cayo Sabinal	33,500	1986
33 Cayo Saetia	4,100	1986
34 Cerro Galano	2,770	
35 Galindo	623	
36 Jibacoa Bacunayagua	30,000	1986
37 La Cienega de Zapata	50,000	1959
38 Laguna de Guanaroca	2,690	
39 Mensura	2,400	
40 Nuevas Grandes	12,000	
41 Peninsula de Saetia	4,154	1986
42 Punta Pederales		
43 Punta de Quemado	3,972	
44 Soroa	800	
45 Tuabaquey	1,100	
Subtotal	17 sites	159,177 ha*

Touristic Natural Areas		
46 Cayo Coco/Cayo Guillermo		32,000 1986
47 Cayo Largo - Cayo Rosario		18,610 1986
Subtotal	2 sites	50,610 ha
Proposed (Faunal Refuges)		
Cayos de Ana Maria		6,900
Delta del Cauto		60,000
Desemb. Maximo		10,000
Los Indios		3,250
Subtotal	4 sites	80,150 ha
Proposed (Flora Reserves)		
Cerro Galano Managed		2,770
Cuabal Tres Ceibas Managed		370
Lomas de Galindo Managed		623
Monte Ramonal Managed		2,572
Pan de Azucar Managed		260
Parnaso - Los Montes Managed		9,500
Punta Negra - Pta. Quemados Managed		3,972
Sistema Lacustre de Arenas Blancas Managed		1,500
Subtotal	8 sites	21,567 ha
Proposed (Integrated Management Areas)		
La Isleta - Nuevas Grandes		13,000
Lagunas Guanaroca		2,690
Subarchipielago de Jardines de la Reina		30,580
Subarchipielago de Sabana - Camaguey		33,100
Subtotal	4 sites	79,370 ha
Proposed (National Park)		
Vinales		13,436
Subtotal	1 site	13,436 ha
Proposed (Natural Parks)		
Bahia del Naranjo Marine		6,800
Cayo Caguama Marine		1,200
Sur Isla de la Juventud		80,000
Tuabaquey		96
Subtotal	4 sites	88,096 ha
Proposed (Natural Reserves)		
Baitiquiri		1,900
Imias		2,600
Loma de la Mensura		2,400
Tacre		1,200
Subtotal	4 sites	8,100 ha
Proposed (Other area)		
Bosque Fossil de Najasa		96
Subtotal	1 site	96 ha
Proposed (Touristic Natural Areas)		
Cayo Algodon Grande		3,600
Cayo Gruz		1,400
Cayo Guajaba		9,168
Cayo Megano Grande		1,800
Cayo Paredon Grande		3,500
Cayo Sabinal		33,500
Cayo Santa Maria		6,250
Covarrubias		10,200
La Laguna del Tesoro-Playa Larga-Playa Giron		3,230
Playa Cajuaajo - Boca del Yumuri		5,500
Punta del Este		5,300
Subtotal	11 sites	83,448 ha

Totals

Existing conservation areas	47 sites	1,323,690 ha*
Proposed conservation areas	37 sites	374,263 ha

* Subtotal is incomplete because of missing data.

DOMINICA

Forest Reserves

1 Central		410	1972
2 Northern		8,800	1972
Subtotal	2 sites	9,210	ha

National Parks

3 Cabrits		531	1986
4 Morne Trois Pitons		6,872	1975
Subtotal	2 sites	7,403	ha

Natural Monument

5 Indian River			
Subtotal	1 site		ha*

Proposed (National Park)

Morne Diablotin		2,497	
Subtotal	1 site	2,497	ha

Proposed (Reserve)

Dyer Estate		83	
Subtotal	1 site	83	ha

Totals

Existing conservation areas	5 sites	16,613	ha*
Proposed conservation areas	2 sites	2,580	ha

* Subtotal is incomplete because of missing data.

DOMINICAN REPUBLIC

Archaeological Parks

1 La Isabela			
2 La Vega Vieja			
Subtotal	2 sites		ha*

Bird Sanctuary

3 Cayos Siete Hermanos			1987
Subtotal	1 site		ha*

Cetacean Sanctuary

4 Banco de la Plata		374,800	1986
Subtotal	1 site	374,800 ha	

National Parks

5 Cabo Frances Viejo		125	1974
6 Del Este		42,000	1975
7 Isla Cabritos		2,400	1974
8 Jaragua		137,400	1983
9 Jose Armando Bermudez		76,600	1956
10 Jose del Carmen Ramirez		73,784	1958
11 Litoral Norte (Puerto Plata)		75	1971
12 Litoral Sur (Santo Domingo)		1,075	1968
13 Los Haitises		20,800	1976
14 Monte Cristi		53,000	1983
15 Parque Submarine La Caleta		1,010	1986
16 Sierra de Bahoruco		80,000	1986
Subtotal	12 sites	488,269 ha	

Scenic Route

17 El Aceitillar-Cabo Rojo ScRo		41,000	1986
Subtotal	1 site	41,000 ha	

Scientific Reserves

18 Ebano Verde Natural		2,310	1989
19 Laguna del Rincon		4,780	1983
20 Lagunas Redonda y Limon		10,100	1983
21 Loma Isabel de Torres		2,200	1983
22 Loma Quita Espuela		7,250	1992
23 Valle Nuevo		40,900	1983
24 Ville Elisa (Dr Orlando Cruz Franco)		15	1976
Subtotal	7 sites	67,555 ha	

Proposed (Other areas)

Bosque Seco del Cibao Sur
 Cabo Engano
 Casabito
 Costa del Este
 Del Este (Extension)
 Diego de Ocampo
 Isla Catalina
 Jaiqui picado
 La Costa del Este
 La Monteada
 Lago Enriquillo
 Lagunas Cabarette y Goleta
 Las Dunas de Bani
 Las Salinas Calderas
 Loma Diego de Ocampo
 Loma Nalga de Maco
 Loma Remigio
 Loma Trocha de Pey
 Loma Valvacoa
 Loma la Herradura
 Loma la Trocha de Pey (= Monteada Nueva)
 Los Haitises Parque (extension)

Playa Chiquita de Azua
 Quito Espuelo
 Rio Comate/Rio Comatillo
 Sierra de Neiba
 Yuvita

Subtotal	27 sites	ha*
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Totals

Existing conservation areas	24 sites	971,624 ha*
Proposed conservation areas	27 sites	ha*

* Subtotal is incomplete because of missing data.

GRENADA

Forest Reserve			
1 Grand Etang		618	1910
Subtotal	1 site	618 ha	
Proposed (Multiple Use Areas)			
Annandale Watershed		205	
Chapeau Carre and FR		5	
Concord Watershed		97	
Forest Reserves and FR		15	
Mt. Hope/Clabony Watershed		265	
Subtotal	5 sites	587 ha	
Proposed (National Parks)			
Grand Etang		959	
High North		245	
Levera		222	
Mt. St. Catherine		578	
Subtotal	4 sites	2,004 ha	
Proposed (Natural Landmarks)			
Annandale Falls		1	
Concord Falls		1	
Fossil Beds at Grand Cay		2	
Hog Island		28	
La Baye Rock		2	
Lake Antoine		34	
Marquis Island		3	
Marquis River Falls		1	
Quarantine Point		3	
River Sallee Boiling Springs		1	
Subtotal	10 sites	76 ha	
Proposed (Other areas)			
Grenada Dove and Grenada Hookbilled Kite Habitat			
Morne Delice Forest Remnant			
Subtotal	2 sites		ha*
Proposed (Protected Seascapes)			
Calivigny Island		5	
La Sagesse		5	
Lauriston Point, Sandy Island, Mabouya		236	
Limlair-Thibaud		6	
Molinere Reef		265	
Northern Seascape		148	
Sabazan		2	
Southern Seascape		39	
Tyrrel Bay Mangrove		113	
White Is., Saline Is. Coral Reefs		390	
Subtotal	10 sites	1,209 ha	
Totals			
Existing conservation areas	1 site	618 ha	
Proposed conservation areas	31 sites	3,876 ha*	

* Subtotal is incomplete because of missing data.

GUADELOUPE

National Park			
1 Guadeloupe		17,300	1989
Subtotal	1 site	17,300 ha	
Nature Reserves			
2 Beaugendre		600	
3 Grand Cul de Sac Marin		3,700	1987
4 Pigeon			
5 Pitons du Nord		3,000	
Subtotal	4 sites	7,300 ha*	
Pre-parc			
6 Guadeloupe National Park		16,200	
Subtotal	1 site	16,200 ha	
Proposed (Other area)			
Les Deux Freres/Belvedere Bi-National Reserve			
Subtotal	1 site		ha*
Totals			
Existing conservation areas	6 sites	40,800 ha*	
Proposed conservation areas	1 site		ha*

* Subtotal is incomplete because of missing data.

HAITI

Natural National Parks

1 Fort Jacques & Fort Alexandre	50	1968
2 Fort Mercredi	5	1968
3 La Citadelle, Sans Souci, Ramiers	2,200	1968
4 La Visite	2,000	1983
5 Lac de Peligre		1968
6 Pic Macaya	5,500	1983
7 Sources Cerisier et Plaisance	10	1968
8 Sources Chaudes	20	1968
9 Sources Puantes	10	1968
Subtotal	9 sites	9,795 ha*

Totals

Existing conservation areas	9 sites	9,795 ha*
Proposed conservation areas	0 sites	ha

* Subtotal is incomplete because of missing data.

JAMAICA

Fisheries Sanctuaries

1 Bogue			1979
2 Bowden			1986
Subtotal	2 sites	ha*	

Forest Reserves

3 Adam Brandon			
4 Armdale		29	1950
5 Ballintoy Block "A"		245	1950
6 Ballintoy Block "B"		93	1950
7 Ballintoy Block "C"		440	1950
8 Ballintoy Block "D"		38	1950
9 Ballitoy			
10 Baron Hill			
11 Barret Pen			
12 Bath Mt. Block "A"		121	1950
13 Baulk Pen Block "B"		107	1950
14 Bellevue			
15 Belmont		63	1950
16 Blenheim		20	1950
17 Blue Mountain Reserve		41,940	1950
18 Bog Hole			
19 Bog Walk "A"		4	1955
20 Bog Walk "B"		8	1955
21 Bogue		112	1955
22 Bottom Hamden		118	1950
23 Brisinaton			
24 Bull Head		220	1950
25 Burnt Savannah Block "A"		39	1950
26 Burnt Savannah Block "B"		40	1950
27 Caenwood		51	1955
28 Cambridge and Rodney Hall			
29 Camperdown			
30 Cedar Valley		243	1950
31 Chatsworth Block "A"		314	1950
32 Chatsworth Block "B"		28	1950
33 Chatsworth Block "C"		34	1950
34 Chepstowe Reserve		150	1950
35 Chesterfield		6	1955
36 Citron Valley		5	1955
37 Clydesdale			1937
38 Cockpit Country		22,327	1950
39 Cockpit Country - Peru Mt.		270	1955
40 Content		56	1955
41 Cooks Bottom		197	1955
42 Dallas Mt. (Elletson Run)		8	1950
43 Deeside			
44 Dias			
45 Discovery		149	1950
46 Dover		25	1955
47 Dromilly Block "A"		32	1950
48 Dromilly Block "B"		25	1950
49 Ecclesdown Reserve Block A		19	1950
50 Ecclesdown Reserve Block B		7	1950
51 Elliston Run			
52 Fellowship			
53 Fergis Ramsay		120	1950
54 Fort Stewart Reserve Block A		71	1955
55 Fort Stewart Reserve Block B		6	1955
56 Friendship Hall			
57 Fyffe and Rankine		966	1950
58 Garlands Block "A"		20	1950
59 Garlands Block "B"		89	1955
60 Garlands Block "C"		30	1955
61 Gourie			

62 Greenock	49	1950
63 Hardware Gap		1937
64 Harkers Hall	6	1950
65 Haycock Hill	147	1950
66 Hellshire Hills		
67 Hyde Block "A"	74	1950
68 Hyde Block "C"	433	1950
69 Hyde Hall Mountain	662	1950
70 Industry Field - Rowkamp	96	1950
71 Jericho Block "A"	113	1950
72 Jericho Block "B"	47	1950
73 Jericho Block "C"	38	1950
74 Jericho Block "D"	26	1950
75 Jericho Block "E"	138	1950
76 John Anderson		
77 Kellits - Camperdown	1,498	1950
78 Kildare	9	1955
79 Llandoff		
80 Lloyds Block "A"	8	1950
81 Lloyds Block "B"	7	1950
82 Lloyds Block "C"	7	1950
83 Lloyds Block "D"	7	1950
84 Lloyds Block "E"	9	1950
85 Lloyds Block "F"	18	1950
86 Lovers Leap	175	1950
87 Lychfield Matheson's Run	4,485	1950
88 Millers Spring Block "A"	8	1950
89 Mosquito River Block "B"	2	1950
90 Mt. Diablo Block "A"	853	1950
91 Mt. Diablo Block "B"	231	1950
92 Mt. Diablo Block "C"	261	1950
93 Muirshead		
94 New Forest Reserve	161	1950
95 New Ground	6	1955
96 Norris Block "A"	115	1950
97 Norris Block "B"	37	1950
98 Norris Block "C"	93	1950
99 Nutfield	9	1955
100 Orange Hill	1	1955
101 Orchard	142	1950
102 Peace River		
103 Peak Bay Block "A"	303	1950
104 Peak Bay Block "B"	153	1950
105 Peak Bay Block "C"	61	1950
106 Peckham	71	1950
107 Pennants Dawes Forest Reserve Block "A"	26	1950
108 Pennants Dawes Forest Reserve Block "B"	3	1950
109 Pennants Dawes Forest Reserve Block "C"	2	1950
110 Pennants Forest Reserve	169	1950
111 Pennants Forest Reserve Block "B"	59	1950
112 Pennent Farm		
113 Petersville	170	1950
114 Pike and Rovens	81	1950
115 Raglan Mountain		
116 Ramble	48	1950
117 Revival		
118 Richmond Pen Block "A"	59	1955
119 Richmond Pen Block "B"	4	1955
120 Richmond Pen Block "C"	3	1955
121 Richmond Pen Block "D"	2	1955
122 Richmond Pen Block "E"	2	1955
123 Richmond Pen Block "F"	15	1955
124 Richmond Pen Block "G"	1	1955
125 Richmond Pen Block "H"	2	1955
126 Richmond Pen Block "I"	2	1955
127 Rockfort	733	1950
128 Ruthven	191	1950

129	Sealthshire Hills	4,856	1950
130	Shuna	458	1950
131	Spring Estate	60	1959
132	Spring Garden	19	1950
133	Spring Vale	57	1950
134	St. Faiths Block "A"	19	1950
135	St. Faiths Block "B"	6	1950
136	St. Faiths Block "C"	1	1950
137	St. Faiths Block "D"	3	1950
138	St. Faiths Block "E"	4	1950
139	St. Faiths Block "F"	6	1950
140	St. Faiths Block "G"	20	1950
141	Stephney John's Vale	6,713	1950
142	Teak Pen Block "A"	533	1950
143	Teak Pen Block "B"	150	1950
144	Treadways	26	1950
145	Troja	19	1955
146	Troy Block "A"	244	1955
147	Troy Block "B"	100	1955
148	Troy Block "C"	173	1955
149	Unity		
150	Virginia	13	1950
151	Windsor - Seamans Valley	36	1955
152	Windsor Lodge	37	1950
	Subtotal	150 sites	94,569 ha*
Game Reserves			
153	Bouge Estate	243	1963
154	Knapdole		
155	Reigate	9	1968
156	Stanmore Hill	85	1988
	Subtotal	4 sites	337 ha*
Marine Parks			
157	Montego Bay	1,530	1991
158	Ocho Rios		1966
159	Port Royal Cays		
	Subtotal	3 sites	1,530 ha*
Multiple Use Management Areas			
160	Jack's Hill Recreational Park		
161	Kingston & St. Andrew Game Reserve		1971
162	Morant Cays		
163	Pedro Bank and Cays		
164	Royal Palm Forest Recreational Park		1986
	Subtotal	5 sites	ha*
Other areas			
165	Bath Botanic Gardens		
166	Castleton Botanic Gardens		
167	Cinchona Botanic Gardens		
	Subtotal	3 sites	ha*
Private Reserves			
168	Arawak Rock Carvings, Pantrepant Cave		
169	Bamboo Avenue		
170	Blue Lagoon		
171	Chesterfield caves		
172	Dunns River Falls		
173	Fern Gully		
174	Glistening Waters Lagoon		
175	Gods Well		
176	Harmony hill caves and arawak carvings		
177	Milk River Bath		
178	Mountain River Cave		
179	Natural Bridge, Riversdale		
180	Rodneys Lookout, Port Henderson Hill		

181 White Marl Arawak Midden		
182 Windsor Cave		
183 YS Falls		
Subtotal	16 sites	ha*
Wildlife Sanctuaries		
184 Luana Point		49 1944
185 Mason River Field Station		49 1944
Subtotal	2 sites	98 ha
Proposed (Fisheries Sanctuaries)		
Coquar Bay - St. Catherine		
Discovery Bay (sections of) - St. Ann		
Falmouth Bay - Trelawny		
Folly Bay - St. Thomas		
Gallon Harbour - NE Portland Bight		
Long Bay - St. Catherine		
Manatee Bay - St. Catherine		
Negril Bay/Bloody Bay - Hanover		
Port Royal Cays (sections)		
Port Royal Mangrove Forest (parts) -St. Andrew		
Salt Marsh Lagoon - Trelawny		
West Harbour - Clarendon		
Subtotal	12 sites	ha*
Proposed (Game Reserves)		
Green Castle Estates		
Passley Garden Estates		295
Subtotal	2 sites	295 ha*
Proposed (Marine Parks)		
Discovery Bay Proposed		
Negril		
Port Maria		
Priory		
San San/Blue Lagoon		
Unity Hall		
Subtotal	6 sites	ha*
Proposed (National Parks)		
Black River Lower Morass		7,284
Blue Mountain/John Crow Mountain		36,423
Canoe Valley		2,024
Cockpit Country		24,282
Dolphin Head Mountain		1,214
Great Morass		2,024
Hellshire Hills		6,475
Palisadoes-Port Royal Cays		100
Portland Bight and Ridge		809
Subtotal	9 sites	80,635 ha
Proposed (Nature Reserves)		
Holland Sawmp Forest NR/SciR		
Mason River field station NR/SciR		81
Middle Morant Cay NR/SciR		
Negril Coastal forest NR/SciR		
Negril Swamp forest NR/SciR		
SE Pedro Cay NR/SciR		
Styx River swamp NR/SciR		
Subtotal	7 sites	81 ha*
Proposed (Wildlife Sanctuaries)		
Cornpus Gap R		
Croft Mountain R		
Font Hill R		445
Goat Islands (Great and Little) R		
Great Pedro Banks R		

Green Castle Estates

Jackson Bay caves R

Parotte Pond R

Rockland R

Round Hill R

Rozelle R

Spur Tree Orchid R

White Rock Hill R

White Rock R

Wyess Falls and Ys environs R

Subtotal

15 sites

445 ha*

Totals

Existing conservation areas

185 sites

96,534 ha*

Proposed conservation areas

51 sites

81,456 ha*

* Subtotal is incomplete because of missing data.

MARTINIQUE

Bird Reserve			
1 Ilets de Ste Anne		5	1988
Subtotal	1 site	5 ha	
Littoral Conservation Areas			
2 Anse Couleuvre		509	1985
3 Cap Macre		10	1987
4 Caravelle		257	
5 Grand Macabou		113	1985
6 Morne Larcher		64	
7 Pointe Rouge		54	1987
Subtotal	6 sites	1,007 ha	
Nature Reserve			
8 Caravelle		517	1976
Subtotal	1 site	517 ha	
Regional Nature Park			
9 Martinique		70,150	1976
Subtotal	1 site	70,150 ha	
Proposed (Other areas)			
Etang des Salines		400	
Montagne Pelee North-west		800	
Savanne des Petrifications		600	
Subtotal	3 sites	1,800 ha	
Totals			
Existing conservation areas	9 sites	71,679 ha	
Proposed conservation areas	3 sites	1,800 ha	

MONTSERRAT

Faunal Reserve		
1 Silver Hills		30 1959
Subtotal	1 site	30 ha
Other areas		
2 Bransby Point		1981
3 Carr's Bay Battery		1985
4 Galway's Estate		2 1990
5 Galways Soufriere		4 1990
6 Great Alps Falls		4 1990
7 Mountain lands		187 1980
8 St. George's Hill		1 1990
9 Woddlands Beach		1980
Subtotal	8 sites	198 ha*
Private Reserve		
10 Fox's Bay Bird Sanctuary		6 1979
Subtotal	1 site	6 ha
Proposed (Other area)		
Montserrat National Park		810
Subtotal	1 site	810 ha
Totals		
Existing conservation areas	10 sites	234 ha*
Proposed conservation areas	1 site	810 ha

* Subtotal is incomplete because of missing data.

NETHERLANDS ANTILLES

Marine Parks

1 Bonaire		6,000	1979
2 Saba		1,000	1987
Subtotal	2 sites	7,000 ha	

National Parks

3 Christoffel (Curacao)		1,860	1978
4 Washington-Slagbaai (Bonaire)		5,900	1969
Subtotal	2 sites	7,760 ha	

Private Reserve

5 Flamingo (Bonaire)		55	1969
Subtotal	1 site	55 ha	

Underwater Park

6 Curacao		1,036	1983
Subtotal	1 site	1,036 ha	

Totals

Existing conservation areas	6 sites	15,851 ha	
Proposed conservation areas	0 sites	ha	

PUERTO RICO

Commonwealth Forests

1 Aguirre		936	1918
2 Boqueron		803	1918
3 Cambalache		374	1951
4 Carite		2,695	1936
5 Ceiba		143	1918
6 Guajataca		927	
7 Guanica		4,006	1919
8 Guilarte		1,457	1935
9 Maricao		4,149	1919
10 Pinones		630	1918
11 Rio Abajo		2,275	
12 Susua		1,315	1935
13 Toro Negro		2,733	1934
14 Vega		448	1951
Subtotal	14 sites	22,891	ha

National Estuarine Research Reserve

15 Jobas Bay		1,371	1981
Subtotal	1 site	1,371	ha

National Forest

16 Caribbean/Luquillo Experimental Forest		11,340	
Subtotal	1 site	11,340	ha

National Wildlife Refuges

17 Cabo Rojo		238	1974
18 Culebra		633	1909
19 Desecheo		146	1968
20 Laguna Cartagena		324	1989
Subtotal	4 sites	1,341	ha

Natural Areas

21 Ballena		71	1991
22 Cabezas de San Juan		128	1975
23 Canon de San Cristobal		332	1974
24 Hacienda Buena Vista		32	1984
25 Hacienda La Esperanza		922	1975
26 Laguna Guaniquilla		157	
27 Lands adjacent to the Bioluminescent Bay		131	
28 Punta Yegua		32	1984
Subtotal	8 sites	1,805	ha

Natural Reserves

29 Caja de Muertos		188	
30 Cayos de la Cordillera, Fajardo			
31 Laguna Tortuguero		1,000	
32 Mona		5,554	
Subtotal	4 sites	6,742	ha*

Wildlife Refuges

33 Boqueron		237	
34 Humacao		1,026	1984
Subtotal	2 sites	1,263	ha

Proposed (National Wildlife Refuge)

Cartagena Lagoon			
Subtotal	1 site		ha*

Totals

Existing conservation areas	34 sites	46,753	ha*
Proposed conservation areas	1 site		ha*

* Subtotal is incomplete because of missing data.

SAINT KITTS AND NEVIS

National Park			
1	Brimstone Hill Fortress		15 1985
	Subtotal	1 site	15 ha
Proposed (Other areas)			
	Black Rocks Natural Monument		
	Cades Bay		
	Gallows Bay Bog		
	Greatheeds Pond		
	Guana Island		
	Hurricane Bay R		
	Mt. Liamigua Central Range		
	Nagshead		
	Nevis Peak 'National Park'		
	New Castle		
	Round Hill/Hurricane Hill		
	Saddle Hill		
	Sandy Point Reef Marine Recreation Area		
	Southeast Peninsula Recreation Area		
	Southeast Peninsula Salt Ponds		
	Subtotal	15 sites	ha*
Totals			
	Existing conservation areas	1 site	15 ha
	Proposed conservation areas	15 sites	ha*

* Subtotal is incomplete because of missing data.

SAINT VINCENT AND THE GRENADINES

Forest Reserves			
1	Colonarie		1948
2	La Soufriere		1948
3	Mesopotamia		1948
	Subtotal	3 sites	ha*
Marine Reserve			
4	Tobago Cays Marine Reserve		3,885 1986
	Subtotal	1 site	3,885 ha
Reserve			
5	St. Vincent Parrot Reserve		4,399 1987
	Subtotal	1 site	4,399 ha
Wildlife Reserves			
6	All Awash Island		1987
7	Battowia Island		1987
8	Big Cay		1987
9	Catholic Island		1987
10	Catholic Rocks		1987
11	Chateaubelair Islet		1987
12	Falls of Baleine		1987
13	Frigate Rock (Island?)		1987
14	Government House Grounds		1987
15	Isle de Quatre		1987
16	King's Hill		1987
17	La Paz Island		1987
18	Milligan Cay		1987
19	Northern end of Bequia		1987
20	Petit Canouan		1987
21	Petit St. Vincent		1987
22	Pigeon (Ramier) Island		1987
23	Prune (Palm) Island		1987
24	Sail Rock		1987
25	Savan Islands		1987
26	Tobago Cays		1987
27	West Cay		1987
28	Young Island		1987
	Subtotal	23 sites	ha*
Proposed (National Park)			
	Tobago Cays		3,885
	Subtotal	1 site	3,885 ha
Proposed (Other area)			
	Lagoon Bay Salt Pond FoR/WR		
	Lagoon Swamp FoR/WR		
	Milikin Bay FoR/WR		
	Richmond Bay Mangrove/Belmont Bay Salt Pond For/WR		
	Subtotal	4 sites	ha*
Proposed (Recreation Areas)			
	Falls of Baleine		
	Mount Wynne Beach		
	Richmond Beach		
	Salt Pond		
	Wallibou Falls		
	Subtotal	5 sites	ha*
Proposed (Wildlife Reserve)			
	Diamond River		
	Subtotal	1 site	ha*

Totals

Existing conservation areas	28 sites	8,284 ha*
Proposed conservation areas	11 sites	3,885 ha*

* Subtotal is incomplete because of missing data.

ST LUCIA

Forest Reserves

1	Addition to Central	"B"	121	
2	Barre-de-L'Isle	North	231	
3	Barre-de-L'Isle	South	724	
4	Castries Waterworks		1,392	1916
5	Central	"A"	1,631	
6	Central	"B"	1,474	
7	Crown Estate of Pelouze			
8	Dennery Ridge		71	
9	Dennery Waterworks		145	1946
10	Forestiere		12	
11	Marquis Estate Parcel M-1		134	
12	Marquis Estate Parcel M-2		35	
13	Marquis Estate Parcel M-3-6		19	
14	Quillesse		1,400	1946
15	Saltibus Grand Magazin		107	
	Subtotal	15 sites	7,496	ha*

Marine Reserves

16	Anse Chastanet Reefs			1990
17	Anse Cochon artificial Reef			1990
18	Anse Galet-Anse Cochon Reefs			1990
19	Anse L'Ivrogne Reef			1986
20	Anse Mamin Reef			1986
21	Anse Pointe Sable-Man Kote Mangroves			1986
22	Bois D'Orange Mangroves			1986
23	Caesar Point to Mathurin Point Reefs			1990
24	Cas-en-Bas Mangroves			1986
25	Choc Bay Mangroves			1986
26	Esperance Harbour Mangroves			1986
27	Fond D'Or Beach			1986
28	Grand Anse Beach and Mangrove			1986
29	Louvet Mangroves			1986
30	Marigot Bay Mangroves			1986
31	Marquis Mangroves			1986
32	Moule-a-Chique artificial reef			1990
33	Praslin Mangroves			1986
34	Reef Between Grand Caille and Rachette Point			1986
35	Reef at Anse de Pitons			1986
36	Reef at Malgretoute			1986
37	Rodney Bay Artificial Reefs			1986
38	Vigie Beach Artificial Reef			1990
	Subtotal	23 sites		ha*

National Historic Park

39	Pigeon Island		20	1978
	Subtotal	1 site	20	ha

Nature Reserves

40	Frigate Islands		6	1991
41	Maria Islands		12	1982
42	Savannes Bay Mangrove Area		500	1982
	Subtotal	3 sites	518	ha

Other area

43	Choc Bay			1985
	Subtotal	1 site		ha*

Reserves

44	De Suze Estate		108	1946
45	Marigot		13	1987
	Subtotal	2 sites	121	ha

Sanctuary			
46 Parrot Sanctuary (Central FoR)		1,494	1980
Subtotal	1 site	1,494 ha	
Proposed (Nature Reserves)			
Barrel O' Beef Rock			
Bigorneau Rocks			
Dennerly Island		1	
Des Bateaux Rocks			
Fous Islands			
L'Islet Island			
Lapins Island			
Liverpool Rocks			
Mamelles Island		1	
Povert Island			
Ramier Island			
Rat Island		1	
Roche Island		1	
Tapion Rock			
Subtotal	14 sites	4 ha*	
Totals			
Existing conservation areas	46 sites	9,649 ha*	
Proposed conservation areas	14 sites	4 ha*	

* Subtotal is incomplete because of missing data.

TRINIDAD AND TOBAGO

Game Sanctuaries

1 Blue Bay	15	
2 Bush Bush	1,554	1968
3 Caroni Swamp	200	1953
4 Central Range	2,153	1934
5 Eastern Tobago	100	
6 Little Tobago	101	1928
7 Maracas	900	
8 Nariva Swamp	1,500	
9 Northern Range	936	1935
10 Saut d'Eau	10	1935
11 Soldado Rock	6	1934
12 Southern Watershed	1,874	1934
13 St. Giles Island	29	1968
14 Trinity Hill	8,246	1934
Subtotal	14 sites	17,624 ha

Nature Reserve

15 Buccoo Reef	650	1973
Subtotal	1 site	650 ha

Prohibited Areas

16 Aripo Savannas	1,800	1987
17 Caroni Swamp	200	1987
Subtotal	2 sites	2,000 ha

Proposed (National Parks)

Buccoo Reef	300	
Caroni Swamp	6,100	
Chaguaramas	5,000	
Eastern Tobago	5,700	
Madamas	7,100	
Maracas	4,800	
Matura	3,500	
Nariva Swamp	5,200	
Subtotal	8 sites	37,700 ha

Proposed (Natural Landmarks)

Blue Basin	1,115	
Cumberland Hill	400	
Devils Woodyard	1	
Galera Point	300	
Goldsborough	1,500	
Pitch Lake	15	
San Fernando Hill	15	
Tamana Hill	200	
Subtotal	8 sites	3,546 ha

Proposed (Nature Conservation Reserves)

ASA Wright	300	
Cedros Peninsula	2,300	
Godineau Swamp	900	
Grafton	200	
Grande Riviere	350	
Innis River	1,300	
Manzanilla	2,000	
Melajo	300	
Navet	2,700	
Point Radix	250	
Southern Watershed	4,200	
Todd's Road	200	
Valencia	1,500	
Subtotal	13 sites	16,500 ha

Proposed (Nature Reserves)		
Brickfield No 1		31
Brickfield No 2		26
Brickfield No 3		9
Longstretch		17
Mahagual		93
Melajo		143
Morne Diablo		162
Mt Harris		18
Rochard Douglas		21
Tamana Hill		132
Subtotal	10 sites	652 ha
Proposed (Recreation Parks)		
Arena		1,600
Castara		2
Caura		30
Clever Woods		15
Granville		15
Laurier Road		15
Little Rocky Bay		2
Los Iros		15
Mayaro		15
Mt. Irvine		2
Oropuche		100
Palmiste		20
Pine Hill		100
Subtotal	13 sites	1,931 ha
Proposed (Scenic Landscapes)		
Blanchisseuse North Coast		1,350
Cocos Bay		300
Mt. Harris		400
Parlatuvier Roxborough		240
Toco-Matelot		1,000
Subtotal	5 sites	3,290 ha
Proposed (Scientific Reserves)		
Anglais Point		10
Aripo Savannas		1,800
Chert Hill		2
Erin Savannas		40
Galeota Point		10
Kilgwyn		100
Lizard Spring		80
Moriquite		8
Moruga Bouffe		150
Sena Bay		6
Tompson		2
Trinity Hills		4,000
White Cliffs		75
Subtotal	13 sites	6,283 ha
Totals		
Existing conservation areas	17 sites	20,274 ha
Proposed conservation areas	70 sites	69,902 ha

TURKS AND CAICOS ISLANDS

Areas of Historical Interest

1 Arawak Village		48	
2 Boiling Hole		1	
3 Cheshire Hall		1	
4 Molasses Reef Wreck		176	1987
5 Salt Cay		1	
6 Sapodilla Rock Carving		123	
7 Yankee Town		350	ha*
Subtotal	7 sites		

National Parks

8 Admiral Cockburn Land And Sea		154	
9 Chalk Sound		1,460	1987
10 Columbus Landfall Marine		518	
11 Conch Bar Caves		95	1987
12 East Bay Islands		3,541	1987
13 Fort George Land & Sea		494	1987
14 Grand Turk Cays, Land and Sea		156	1987
15 Leeward Land & Sea and		500	1987
16 North West Point		1,026	1987
17 Princess Alexandra		2,645	
18 South Creek		74	1987
19 West Caicos Marine		397	
Subtotal	12 sites	11,060	ha

Nature Reserves

20 Admiral Cockburn		431	
21 Bell Sound		1,142	1975
22 Cottage Pond		8	
23 Dick Hill Creek, Bellfield Landing Point		394	
24 Lake Catherine		392	
25 Little Water Cay, Donna Cay and Mangrove Cay		182	
26 North West Point Pond		61	
27 Pigeon Pond and Frenchman's Creek		2,393	
28 Pumpkin Bluff Pond		173	
29 Vine Point Ocean Hole		757	1987
Subtotal	10 sites	5,933	ha

Other area

30 Grand Turk West Shore Marine			
Subtotal	1 site		ha*

Sanctuaries

31 Big Sand Cay		151	1987
32 French, Bush and Seal Cays		20	1987
33 Long Cay		80	1987
34 Three Mary Cays		13	1987
Subtotal	4 sites	264	ha

Totals

Existing conservation areas	34 sites	17,607	ha*
Proposed conservation areas	0 sites		ha

* Subtotal is incomplete because of missing data.

VIRGIN ISLANDS (US)

National Historic Site

1 Christiansted

Subtotal

1 site

ha*

National Monument

2 Buck Island Reef

Subtotal

1 site

356

1961

356 ha

National Park

3 Virgin Islands

Subtotal

1 site

14,079

1956

14,079 ha

National Wildlife Refuges

4 Buck Island

18

1969

5 Green Cay

12

1977

6 Sandy Point

134

Subtotal

3 sites

164 ha

Proposed (Protected Area)

Salt River Submarine Canyon

Subtotal

1 site

1,000

1,000 ha

Totals

Existing conservation areas

6 sites

14,599 ha*

Proposed conservation areas

1 site

1,000 ha

* Subtotal is incomplete because of missing data.

Annex 12.2 Extent of notified forests by forest origin and forest function. Non–forest includes both degraded forest and lands not forested at the time of their reservation.

Region: Latin America

Sub–region: Caribbean Subregion

Name of country/state: Anguilla

Total area (sq.km): 91

Land area (sq.km): 91

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non–forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes:

There are no existing legally gazetted forest areas.

Region: Latin America

Name of country/state: Antigua and Barbuda

Land area (sq.km): 440

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	3800					
Non-forest						
Plantation						
TOTAL	3800	0	0	0	0	0

Notes: Source of information: CCA (1991). Antigua and Barbuda: Country Environmental Profile. Caribbean Conservation Association/Island Resources Foundation/Environmental Awareness Group/ US-AID. 212pp.

Annex 12.2 (continued)

Region: Latin America		Sub-region: Caribbean Subregion				
Name of country/state: Aruba						
Total area (sq.km): 190						
Land area (sq.km): 190						
Month/year of reference:		1992				

	F O R E S T		F U N C T I O N			
FOREST	Production forests		Protection forests		Conservation forests	
ORIGIN	Existing	Proposed	Existing	Proposed	Existing	Proposed
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)

Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: Source information from IUCN (1992). Protected Areas of the World: A review of national systems. Volume 4: Nearctic and Neotropical. Draft Document.

Only a very small proportion of the island remains forested, there are no legally gazetted forest reserves.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Bahamas

Total area (sq.km): 13880

Land area (sq.km): 10010

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: Information from the Department of Lands and Surveys, in litt., 1991

No forest policy or legislation exists in the Bahamas. It is proposed to legally constitute the forest estate, through the establishment of forest reserves, and to promote the conservation of areas of special scientific or recreational value. Crown land under natural pine forest amounts to 203610ha, of which 190500ha are under productive management.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Barbados

Total area (sq.km): 430

Land area (sq.km): 430

Month/year of reference: 1990

FOREST ORIGIN	FOREST FUNCTION					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: The source information is IUCN (1992). Protected Areas of the World: A review of national systems. Volume 4: Nearctic and Neotropical. Draft Document.

Very little natural forest remains on Barbados, there are no legally gazetted forest reserves.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Bermuda

Total area (sq.km): 50

Land area (sq.km): 50

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: No forest legislation exists in Bermuda. Under the Bermuda Development Plan 1983: Planning Statement 1989, a network of 23 woodland reserves, covering a total area of 33.75ha, has been designated, within which protection of stands of trees and other vegetation takes precedence over all other planning considerations. All of these reserves lie within parks, as created under the National Parks Act 1986.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: British Virgin Islands

Total area (sq.km): 150

Land area (sq.km): 150

Month/year of reference: 1990

FOREST ORIGIN	FOREST		FUNCTION			
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	39800		2541			
Non – forest			1907			
Plantation						
TOTAL	39800	0	4448	0	0	0

Notes: The source is the Department of Agriculture, in litt., 1991.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Cayman Islands

Total area (sq.km): 260

Land area (sq.km): 260

Month/year of reference: 1990

FOREST ORIGIN	P R O D U C T I O N		P R O T E C T I O N		C O N S E R V A T I O N	
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: The source is the Natural Resources Unit, in litt., 1991

No forestry legislation exists for the Cayman islands

Annex 12.2 (continued)

Region: Latin America			Sub--region: Caribbean Subregion			
Name of country/state: Cuba						
Total area (sq.km): 110860						
Land area (sq.km): 110860						
Month/year of reference: 1991						

	F O R E S T		F U N C T I O N			
FOREST	Production forests		Protection forests		Conservation forests	
ORIGIN	Existing	Proposed	Existing	Proposed	Existing	Proposed
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)

Natural	659800		720400			
Non--forest						
Plantation						
TOTAL	659800	0	720400	0	0	0

Notes: The source is the MINAG (1991). Plan de accion forestal para Cuba, documento base. Ministerio de la Agricultura, C de la Habana. 58pp.

Protection forests here represent the total of areas of forest classified for the protection of water and soil resources and for the protection of the coastline. Some 308,200ha of the total area of forest in the country consists of plantation forest, but it is not included in Table 1 because its legal status and function is unclear.

Deforested areas (superficie desarbolada) are not included in these figures, they represent a further 309,000ha, while 'superficie inforestal' covers a further 492,300ha.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Dominica

Total area (sq.km): 750

Land area (sq.km): 750

Month/year of reference: February 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	6013		3171		40	
Non-forest						
Plantation						
TOTAL	6013	0	3171	0	40	0

Notes: The source is the Ministry of Agriculture, in litt., 1991

The total area covered by the country's two forest reserves is 9224ha. The area is subdivided by the Forestry Division into commercial (viz production), protection and amenity forest (viz conservation), as above.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Dominican Republic

Total area (sq.km): 48730

Land area (sq.km): 48730

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T		F U N C T I O N			
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: The source is DVS (1990). La diversidad biológica en la Republica Dominicana. Departamento de Vida Silvestre, Santo Domingo. 266pp.

There are no forest reserves in the country that are run by the forestry administration as distinct from the conservation authorities.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Grenada

Total area (sq.km): 340

Land area (sq.km): 340

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1683.4					
Non-forest						
Plantation						
TOTAL	1683.4	0	0	0	0	0

Notes: The source is CCA/IRF (1991). Grenada: environmental profile. Caribbean Conservation Association/Island Resources Foundation, St Michael, Barbados. 276pp.

The figure for natural production forest is the total area covered by forest reserves on Grenada and Carriacou.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Guadeloupe

Total area (sq.km): 1710

Land area (sq.km): 1690

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T		F U N C T I O N			
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1000		8000		26300	
Non-forest						
Plantation	3500					
TOTAL	4500	0	8000	0	26300	0

Notes: Information from the 1990: Note sur la politique forestière de l'Office National des Forêts, Guadeloupe. 8pp.; Chabod, in litt., 1991 The above figures are based on a new ministerial decree. The area of the national park (16,500ha) is excluded from the 24,500–25,000ha of protection forest zone. Production forests (zones réservées a la sylviculture) include natural and plantation forests, the area quoted as plantation forest is actually given as 2,500–3,000ha. In total the National Forest Office manages a total of 38,800ha of forest. The status of the remaining areas (over 10,000ha) not covered by this Table is unclear.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Haiti

Total area (sq.km): 27750

Land area (sq.km): 27560

Month/year of reference: 1992

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: Information from IUCN (1992). Protected Areas of the World: A review of national systems. Volume 4: Nearctic and Neotropical. Draft Document.

Forest reserves have been in existence for some time and are administered separately from national parks, however no information is available concerning the area covered by these.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Jamaica

Total area (sq.km): 10990

Land area (sq.km): 10830

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	94635					
Non – forest	3239					
Plantation	18907					
TOTAL	116781	0	0	0	0	0

Notes: Information from the Forests Department, in litt., 1991

There are a total of 62 forest reserves covering 11,6781ha in the country. This area represents about 10% of the country. Many of these reserves were established to conserve the natural forests on the upper mountain slopes, which are vital for watershed protection and soil conservation – commercial forestry and plantation forestry is allowed in parts of these reserves, while other areas are set aside for conservation. The extent of conservation forest is not known.

The natural forest area is classed into well-stocked (60,728ha), understocked (13,664ha and wooded lands (20,243ha). The non-forest area is described as being under agriculture.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Martinique

Total area (sq.km): 1100

Land area (sq.km): 1060

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	4900		4800		4600	
Non-forest						
Plantation						
TOTAL	4900	0	4800	0	4600	0

Notes: Information from IUCN Protected Areas of the World: A review of national systems. Volume 4: Nearctic and Neotropical. Draft Document.

Annex 12.2 (continued)

Region: Latin America			Sub-region: Caribbean Subregion			
Name of country/state: Montserrat						
Total area (sq.km): 100						
Land area (sq.km): 100						
Month/year of reference: 1992						

	F O R E S T		F U N C T I O N			
FOREST	Production forests		Protection forests		Conservation forests	
ORIGIN	Existing	Proposed	Existing	Proposed	Existing	Proposed
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)

Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: The source is IUCN (1992). Protected Areas of the World: A review of national systems. Volume 4: Nearctic and Neotropical. Draft Document.

 All lands above the 1500ft (457m) contour have been protected from forest clearing as a watershed conservation measure since 1932. The 1956 Forestry Ordinance gives powers to declare further areas of forest as protected on lands susceptible to erosion, or important as sources of water or timber.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Netherlands Antilles

Total area (sq.km): 990

Land area (sq.km): 990

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non-forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: Data provided by the Ecological Institute

No forestry legislation exists

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Puerto Rico

Total area (sq.km): 8900

Land area (sq.km): 8860

Month/year of reference: 1991

FOREST ORIGIN	FOREST FUNCTION					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural					35640	
Non – forest						
Plantation						
TOTAL	0	0	0	0	35640	0

Notes: The source is Department of Natural Resources, in litt., 1992

The figure for natural conservation forest represents the combined area of the one national forest, federally administered by the US Forest Service (this site has also been designated by UNESCO as a Biosphere reserve), and the 14 commonwealth forests, administered by the Puerto Rican Forest Service.

Annex 12.2 (continued)

Region: Latin America

Sub–region: Caribbean Subregion

Name of country/state: St. Christopher and Nevis

Total area (sq.km): 360

Land area (sq.km): 360

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non–forest						
Plantation						
TOTAL	0	0	0	0	0	0

Annex 12.2 (continued)

Region: Latin America		Sub-region: Caribbean Subregion				
Name of country/state: Saint Lucia						
Total area (sq.km): 620						
Land area (sq.km): 621						
Month/year of reference: 1992						
	F O R E S T		F U N C T I O N			
FOREST ORIGIN	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	23		45		66.33	11
Non-forest						
Plantation	3		45			
TOTAL	26	0	90	0	66.33	11

Region: Latin America

Name of country/state: St. Vincent and the Grenadines

Total area (sq.km): 390

Land area (sq.km): 390

Month/year of reference: 1992

583

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Trinidad and Tobago

Total area (sq.km): 5130

Land area (sq.km): 5130

Month/year of reference: 1992

FOREST ORIGIN	F O R E S T		F U N C T I O N			
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	99700		31700		18150	
Non – forest						
Plantation						
TOTAL	99700	0	31700	0	18150	0

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: Turks and Caicos Islands

Total area (sq.km): 430

Land area (sq.km): 430

Month/year of reference: 1992

FOREST ORIGIN	F O R E S T		F U N C T I O N			
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural						
Non – forest						
Plantation						
TOTAL	0	0	0	0	0	0

Notes: No forestry legislation exists.

Annex 12.2 (continued)

Region: Latin America

Sub-region: Caribbean Subregion

Name of country/state: US Virgin Islands

Total area (sq.km): 340

Land area (sq.km): 340

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	2000					
Non-forest						
Plantation						
TOTAL	2000	0	0	0	0	0

13 TROPICAL SOUTH AMERICA



13 TROPICAL SOUTH AMERICA

Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela

13.1 HISTORICAL PERSPECTIVE

Human history in tropical South America goes back at least 20,000 years, when the first people migrated from the north across the Panama isthmus. They reached the Amazon basin 10,000 years later. A large proportion of this population was hunter-gatherers. Others were agriculturists practising slash and burn, shifting, or more sedentary forms of agriculture. Many of these peoples had close links to the forests of the region, and hence the concept of resource protection would not have been a subject for discussion, but rather an integral part of their very existence, traditions and culture. There is some evidence that the Inca Empire, which occupied a large part of the west of the continent, undertook some activities which parallel western resource protection measures, including wildlife management and hunting restrictions.

The 'discovery' and subsequent settlement of America by Europeans led to profound changes in the environment. Many of the Amerindian communities were decimated by war, slavery and disease; this occurred alongside rapid environmental changes, including the clearance of large areas of forest, beginning with the Atlantic forests of Brazil, which were first colonised around 1500.

Conservation and conservation areas have been very slow to develop in most countries of the subregion, the one exception being Brazil. Here, a Royal Charter in 1797 provided some measures for forest protection, with severe penalties for burning and destroying forests. In Bolivia, the government which formed after independence in 1832, gave some mention to natural resource protection. The first proposals for the establishment of national parks were put forward in Brazil in 1876; however, these were not accepted. Generally, natural resource protection gained little priority until the 1930s and 1940s. This may be partly related to the fact that vast areas of the region remained undeveloped, in a natural or semi-natural state, such that there was little perception of the need for protection.

Forestry has yet to become a major industry in the subregion to the same degree that it has in parts of Asia and Africa. Hence, forestry legislation does not play such a pivotal role in natural resource protection. Early legislative protection for the environment came from a wide range of forestry, hunting, fishing, watershed protection, faunal protection and general conservation laws. Another development has been the recognition of the rights of the Amerindian populations to use land, and the legal handing over of vast territories to these people, many of whom have maintained their traditional lifestyles. Colombia has led this approach: some 67 sites had been designated prior to 1961 and there are now over 300 *resguardos* and reserves for indigenous peoples, covering over 26 million ha. Other countries following similar policies include Guyana, Peru, Brazil and Venezuela.

Although recent, the current conservation areas network in these countries is generally well-developed in terms of coverage. Administration of areas usually falls under a single government body, although forestry and conservation/wildlife are normally within different departments. French Guiana is exceptional in a number of ways, being an administrative region of France. NGOs are well-developed in a number of countries and have become fairly powerful, often helping with the management of conservation areas, or even establishing private conservation areas, for example, in Colombia and Paraguay. In Brazil, the administration of natural resources has been delegated largely to the 26 states and one federal district, and there is little in the way of national coordination. There have also been problems in Brazil arising from conflicts between the institute responsible for the environment and that responsible for the needs of the indigenous people.

13.2 NATURE CONSERVATION POLICY AND LEGISLATION

Legal provisions for the establishment of conservation areas exist in all South American countries. These are summarised in Table 13.1 and reviewed below.

13.2.1 Forestry Sector

Policy As mentioned, commercial forestry has been slow to develop over much of South America, and consequently the development of policies and legislation to deal with this has come fairly late. A number of countries now have official policy relating to forestry issues. These are often in the form of action plans, which centre around a number of specified projects, as in the case of Colombia.

In Guyana, one of the projects included in the National Forestry Action Plan is a revision of forestry policy and legislation. Currently, two distinct policies regarding forest use exist: the State Planning Commission places heavy emphasis on increasing exploitation of forests for food and materials, without considering sustainability, while the Guyana Forestry Commission has a policy of increasing forest resource exploitation, but in compliance with other measures for increased protection in certain areas. This latter policy bases its protection aims on conserving genetic diversity, promoting research, maintaining natural habitat and the population of endangered species and the protection of mangrove forests. Management plans for forests usually prohibit production on steep slopes (over 18°) and within 30m of river banks.

In several cases forest policies are based on national tropical forest action plans drawn up under the guidance of the FAO Tropical Forestry Action Plan. This is an international strategy for maximising the contribution of forestry sectors to national economic and social development while maintaining conservation principles. Four countries have not participated in the FAO Tropical Forest Action Plan: Brazil, French Guiana, Paraguay and Venezuela. In Brazil, forest policy is covered at least in part by the 1965 New Forestry Code and its amendments - the Code replaced the First Forestry Code, 1934. Forestry policy is also covered partly under the National Policy for the Environment, established by law in 1981.

French Guiana has no forest policy. The department is officially covered by French policy and legislation, although to date this has had very little practical application.

In Paraguay, environmental and forestry legislation is centred around protection and conservation as well as the rational use of resources. A 100m-belt of protected forest is left on either side of rivers, streams, water sources and lakes, which may be increased around more important water sources.

Legislation In many countries, there is little or no distinction between forestry and wildlife legislation. In Brazil, Colombia, Paraguay and Suriname there are close administrative links between these sectors, while in other cases, the legislation itself covers both sectors, either through the original texts, or in subsequent regulatory or planning legislation.

Some of the earliest forestry legislation in the subregion was enacted in Brazil, where the First Forestry Code was promulgated in 1934. In Venezuela, the Forest, Soils and Water Act was passed in 1943, although forest reserves were first defined under 1964 regulations to this Act. In Suriname, forest reserves were defined under the Forest Law of 1947.

Both Colombia and Bolivia have forestry legislation providing for the establishment of forest reserves, which is distinct from wildlife legislation. Countries where the same legislation applies to both sectors include Venezuela, Paraguay and Brazil, where legislation for conservation areas has been amended to existing forestry legislation. Peru and Ecuador also both have legislation which provides for protection/conservation forests as well as conservation areas. In Brazil's New Forestry Code of 1965, parks and biological reserves are established largely for educational, recreational and scientific purposes, while national, state and municipal forests are established for economic, technical or social purposes. Article 16 of this law limits the use of privately-owned forests, and sets minimum limits of 20-50% on the forest cover of this land.

Legislation is limited in both French Guiana and Guyana. In the former, the national French legislation applies, but no areas have been designated, while in the latter, the Forest Act of 1973 defines and regulates the uses of state forest, but does not provide for the designation of specified areas.

13.2.2 Wildlife Sector

Policy A number of countries have detailed national conservation strategies, all of which are relevant to conservation areas. In Ecuador, a very general policy document - the Preliminary Strategy for the Conservation of Outstanding Natural Areas in Ecuador - was drawn up in 1976 to coordinate government planning at the national and regional level; however, recent development plans have largely ignored these objectives. Guyana's National Environmental Policy was formulated and approved in 1990 and considers the preservation biodiversity, maintenance of ecosystems and sustainable use of natural resources at the national level.

Non-governmental organisations were responsible, largely with governmental support or cooperation, for the drafting of national conservation strategies in Peru and Venezuela in 1988 and 1989. These place particular importance on the establishment of conservation areas.

French Guiana has no overall policy of its own, although it is covered, and receives specific mention, in the French 1990 National Plan for the Environment. Other countries in the region, such as Bolivia, Colombia and Paraguay, have no overall policy documentation; some still have detailed legislation, but problems can and do arise from lack of coordination between regions and from conflicting interests between different government bodies.

Legislation All countries in the region have at least some conservation area legislation originating mainly from the 1970s and 1980s, although some legislation dates back to the 1950s (Suriname and Colombia). Legislation in a number of countries is closely linked to the forestry sector legislation (Section 13.2.1). Paraguay and Guyana have perhaps the least comprehensive legislation, with a very limited range of designations. French Guiana, although officially covered under the whole range of French conservation areas legislation, has been slow to apply this to the designation of sites.

Most other countries have extremely comprehensive legislation, providing for a range of conservation area categories, ranging from strict protection to sustainable use categories. Problems have arisen, notably in Brazil, from the large range of categories which have been established under national, state and regional legislation, but which have no central coordination. In a number of countries, in Bolivia and Ecuador for example, sites are designated by individual decree. Many of the provisions providing for the protection of these areas are defined under these decrees, and some categories of conservation area declared under these decrees are not described at all under general legislative texts.

13.2.3 Additional Sectors

A number of countries have recognised the rights of indigenous Amerindian populations in the subregion. In Peru, this recognition extended to land rights established in 1974 under the Law of Nature Communities and Agrarian Development for the Jungle and Adjacent Forest Regions. Its provisions allow these people to continue their traditional activities within conservation areas. In Guyana, nearly 10% of the total forest area has been designated as Amerindian lands, but information concerning the legal status is unavailable.

Both Colombia and Brazil have an ongoing policy of handing over land to indigenous peoples, in large, legally notified blocks: indigenous reserves and *resguardos* in Colombia, and a number of categories in Brazil including indigenous areas and extractivist reserves.

13.3 MANAGED AREAS ADMINISTRATION

The administration of the forestry and wildlife sectors in the subregion is often closely linked. In some countries there is only one administrative agency; in others, the responsible agencies are linked as departments within a larger organisation; and in almost every country they fall under the overall jurisdiction of the same ministry.

13.3.1 Forestry Sector

Historically, natural resource administration has arisen from the forestry sector in most countries, with the wildlife sector forming subsequently. Thus, in Ecuador, the first body specifically designated for natural resource management was the Forestry Service within the Ministry of Agriculture and Livestock. There followed a series of changes, leading to the current situation where the Subsecretariat of Forests and Natural Resources has within it the National Forestry Directorate. The Directorate is further divided into three subdivisions, two of which can be related directly to forestry, while a third is responsible for natural areas and wildlife. In addition to the centralised structure, some 21 district forestry units lie within respective provincial farming managements.

A similar situation exists in a variety of countries, such as Bolivia, Paraguay, Peru, Suriname and Venezuela, where a centralised forestry agency, under the supervision of a ministerial body, is often closely linked to a wildlife agency, and with regional forestry units. In a number of countries, forestry administration has been given a degree of autonomy. The Venezuelan Forestry Service is an autonomous institute (attached to the Ministry of Environment and Renewable Natural Resources). In Guyana, the Guyana Forestry Commission has a major involvement in natural resource conservation. There is also a National Parks Commission, although little information is available concerning its role.

In Brazil there have been numerous changes to the central organisation in the forestry sector. Currently, forestry issues are administered by the Brazilian Institute for the Environment and Renewable Natural Resources (which is part of the Ministry of the Environment).

In Colombia, two bodies are responsible for the administration of forest resources - the National Institute of Renewable Natural Resources is responsible for forest reserves declared under 1959 legislation, while the Colombian Institute of Agrarian Reform is responsible for assigning administrative rights to forested land outside these reserves.

French Guiana is covered by national French Administration - forestry issues are thus covered by the National Forest Office in the Ministry of Agriculture.

13.3.2 Wildlife Sector

In most cases, conservation areas are established and administered by organisations closely linked to the forestry organisations. In Bolivia, for example, conservation areas and wildlife are the responsibility of the Wildlife, National Parks, Hunting and Fishing Department which lies within the Forest Development Centre, an autonomous organisation within the Ministry of Rural and Agrarian Affairs. In Peru, the National Parks Directorate, one of five directorates within the General Directorate of Forestry and Fauna, is complemented by National-Parks Peru, a decentralised institution in the agrarian sector.

As with the forestry sector, conservation areas in French Guiana fall under national French administration, in this case, the Department of Nature Protection in the Ministry of the Environment.

From 1967 to 1989, the Department of National Parks and Equivalent Reserves of the Institute of Forestry Development was responsible for conservation areas in Brazil. In 1989, the Institute for Environment and Natural Renewable Resources was established, covering both forestry and wildlife sectors. Within this Institute, the Ecosystem Directorate has two departments with responsibility for conservation areas. There are also two independent consultative councils linked to this Institute: the National Council for Conservation Units and the National Council for the Protection of Fauna. This basic structure is complicated by the fact that much of the work of designating and administering conservation areas is the responsibility of the 26 states and one federal district, and coordination of this at the federal level is limited. Colombia, too, shows a degree of regionalisation in its administration.

A number of countries have established conservation data centres within their administrative hierarchies, or attached to higher education or research institutions. The role of these is generally to compile and process information on ecology, the distribution of endangered species, and conservation areas. Some also have an

advisory role and are involved in drafting proposals for new conservation areas. Countries with such institutions include: Bolivia, Colombia, Ecuador, Paraguay, Peru and Venezuela.

13.3.3 Additional Sectors

Designated Amerindian lands are typified by their high degree of autonomy. Effectively, the land is given to tribal communities who are then free to undertake whatever activities they may choose in these areas. In Brazil, Amerindian lands are established and administered by the National Indian Foundation in the Ministry of the Interior. This organisation lies in a different Ministry from the Institute for Environment and Natural Renewable Resources, and there has been little cooperation between them in the past. By contrast, Amerindian issues in Colombia are covered by the Colombian Institute of Agrarian Reform, one of the two bodies responsible for forestry in that country.

13.3.4 Non-Governmental Organisations

The number of NGOs, and their involvement in conservation areas, has increased considerably over the past decade. Guyana and French Guiana have little or no NGO activity to date, although a considerable amount of research has been undertaken by national French institutions in the latter. The role played by NGOs in other countries varies considerably. The Foundation for Nature Preservation in Suriname was established in 1969 specifically to assist the Forest Service in managing nature reserves. This role has grown and it is now also involved in nature tourism, research and environmental education. This cooperative role of NGOs with government bodies is repeated in most countries: in Peru, NGOs have greatly increased the number of qualified personnel available, and also provide equipment, research and contribute to environmental education. The Peruvian Foundation for Nature Conservation provides managerial support for a number of conservation areas, including four of the seven national parks.

Ownership of conservation areas by NGOs is not widespread; however, there are a number of privately-owned reserves in Paraguay, managed by landowners, NGOs or cooperatives, but they have no legal designation. There are also four large areas in Paraguay which have legal designation as biological reserves and biological refuges and are managed by the Itaipu Binational Company: they were established by a major hydroelectric project.

There is some coordination between NGOs in some countries, provided, for example, by the Environmental Defence League in Bolivia and the Peruvian Network of NGOs in Peru.

13.4 MANAGED AREAS STATUS

The managed areas system is mapped for each country within the subregion in Fig. 13.1. Details of the individual conservation areas are given in Annex 13.1 which also serves as a key to the maps. These areas are split between the forestry sector, the wildlife sector and the additional sector. This latter sector contains the largest number of sites and covers the largest area in the subregion (46% of the total conservation areas, by size), due, almost entirely, to the large number of Amerindian areas in Brazil, Colombia and Guyana. The wildlife sector covers most other conservation areas (34%), while the forestry sector covers the remainder (20%).

13.4.1 Managed Areas within the Forestry Sector

Coverage Most of the forest estate is allocated for commercial purposes: this is the traditional role of the forestry sector, and this, coupled with the close administrative links with the wildlife sector generally, means that all lands of conservation importance are dealt with by the latter. Peru is an exception. Its forestry sector administers some 5.6% of the total area as notified reserves, over half of which is protection or conservation forest.

Legally gazetted natural forest, administered by the forestry sector, accounts for some 10.8% of the total land area of the subregion (see Table 13.2), although the inclusion of other state-owned forest land would

undoubtedly give a much higher estimate. Every country in the region has huge areas of forest which are state-owned or nationalised. This ownership is frequently clarified further by specific legislation, which may include specific restrictions concerning the use of this land, although not usually specifying delineated areas. In some countries, a further form of legal definition is provided by the granting of concessions to specified areas, which may be within, overlap with, or be separate from legally gazetted forest reserves. Thus, in Bolivia, all forests are nationalised (some 52% of the total land area of the country), while almost half of this has been granted, under concession, to commercial forestry. In Guyana, 55% of the total forest area, or 46% of the total land area, is described as state forest; all of this land is available for timber concessions.

13.4.2 Conservation Areas within Forestry, Wildlife and Additional Sectors

Coverage There are some 1,583 legally designated conservation areas in Tropical South America, covering a total of 259.9 million ha or 18.4% of the total area of the region (Fig. 13.1). The forestry sector is directly responsible for 350 conservation areas covering 51.1 million ha or 3.6% of the region. Approximately 22% of these areas are under total protection, covering 4% of the subregion.

If 10% of the total area of any country is taken as a realistic minimum which should be protected for conservation purposes, then most countries in Tropical South America are well protected (Table 13.3). Ecuador has the highest coverage of conservation areas in the region (46.3%), but much of this is accounted for by the Galapagos Marine Resource Reserve, some 7.99 million ha, 99% of which is marine. Exclusion of this area gives the remaining proportion of Ecuador covered by conservation areas as some 18.1%. Colombia and Venezuela also have a very high proportion of conservation areas, 31.5% and 40.3% of their total areas, respectively. In Colombia by far the highest proportion of this area consists of areas set aside for use by indigenous peoples. Brazil, too, has a high coverage, again largely made up of a large number Amerindian areas covering some 142 million ha, or 16.4% of the total area. Most remaining countries have below 10% of the total area protected, ranging from 7.4% in Peru to 3.2% in Paraguay.

The 10% target should be considered as an absolute minimum for Tropical South American countries because the potential for large-scale area conservation is probably greater for this region than for any other tropical forest region in the world, with relatively low populations over wide areas and some of the largest areas of undamaged tropical forest in the world. Further considerations which would support the protection of large areas include the protection of the lives and homes of indigenous peoples and the possible climatic effects of mass deforestation on a local, regional and global scale.

Representativeness Historically, the designation of areas has been haphazard to some degree, with little regard paid to ecological criteria for the selection of sites. The lack of detailed system plans or policies for nature conservation has undoubtedly contributed to this. In places, the lack of protection has led to widescale loss of ecosystems, such that, even if much of the remainder is protected, this will only be a poor representation of the former ecosystem, as is the case for Brazil's Atlantic forest. As might be expected, the extensive network of conservation areas in Venezuela covers most ecosystems. Suriname, too, has protected representations of most of its major ecosystems, and proposes to protect even more.

Mountainous areas are well-represented, notably in Bolivia, Ecuador and Colombia. Areas which are less well-covered are typically those of high value due to fertile soils or proximity to densely populated areas: for example, the humid rain forests and mangroves along the Pacific coastal plain in Colombia and Ecuador are very poorly represented and highly threatened. Also poorly represented are the semi-arid lowland and mountainous forest in parts of Bolivia.

The small proportion of conservation areas in French Guiana and Guyana clearly leaves large areas unrepresented, but in these countries, as in a number of other countries or parts of countries, low population densities and huge areas of undisturbed land mean that these areas may not be severely threatened for some time.

Integrity Using mean size as a measure of integrity, data in Table 13.4 indicate that conservation areas throughout the subregion tend to be large or very large. Reasons for this could include the relatively recent history of exploitation of the region, and hence the large areas of relatively undisturbed land available for protection. The lack of small sites could be seen as an indication of the lack of protection at the local scale, in areas of high population density, it may also indicate a lack of detailed knowledge of ecosystems and hence of the singling out of small sites of particular relevance.

The mean size of totally protected areas in the subregion is usually much smaller than that of partially protected areas. In the former category, national parks are generally large, however, the mean for this category is brought down in most countries by the existence of other totally protected categories, such as biological reserves, of a smaller size. Partially protected sites in the subregion include indigenous areas, protection forests and faunal and hunting reserves, many of which are extremely large.

Effectiveness Apart from inadequate representation of some parts of the subregion's biological diversity within existing conservation area networks, conservation efforts are limited by poor implementation of policy and legislation, inadequate institutional support and ineffective management; this is especially true of those areas in the more isolated parts of Amazonia.

As mentioned in Section 13.2, conservation policies do exist in a number of countries, both in the forestry and the wildlife sectors. In most cases, these policies are recent and have yet to be fully proven. French Guiana and Paraguay are notable for their lack of a coherent policy in the forestry sector, while these and three other countries, Bolivia, Colombia and Guyana, have no detailed policy statements for their wildlife sectors. Lack of funding, combined with conflicts of interest with other government bodies, is likely to hinder the implementation of policy in some countries.

In a number of countries the legislative base for conservation purposes is limited, notably in Suriname, Paraguay and Guyana. Elsewhere, notably in French Guiana, the potential legislative base is strong, however implementation is lacking. In Bolivia and Ecuador legislation exists, but often lacks details, or is uncoordinated and inconsistent. Brazil and Venezuela both have extremely detailed and complex legal systems; this is perhaps too complex in Brazil, with its national and regional legislation.

Institutional resources for conservation area management are inadequate throughout the subregion. Data for national expenditure in conservation areas are not readily available. Funding is limited in almost every country, and this is frequently the major reason behind other failings in effectiveness. Lack of personnel and equipment is common in every country.

In a number of countries sites are not managed in accordance with the legislation. In Bolivia, for example, the government has plans to exploit 12 of its conservation areas, while in Ecuador petroleum and mining companies violate regulations in a large number of conservation areas. In other countries the lack of enforcement can be related to lack of human resources at site level. Encroachment of conservation areas by miners and farmers is a feature of many sites in Brazil and Venezuela, while guerrilla activities and the activities of cocaine producers cause considerable damage in some countries, notably Peru and Colombia.

Few sites in the subregion have management plans or an organised infrastructure. Sao Joaquim National Park in Brazil, for example, was established in 1961, and yet still has no infrastructure. A large proportion of the Brazilian sites have no staff. In Venezuela, where the administrative structure is relatively well developed, the lack of trained staff and equipment has led to the involvement of the armed services in the management of some sites.

Constant administrative changes have been a problem in Peru, as has a lack of communication between national and regional bodies. Similar problems occur in Bolivia.

13.4.3 Contribution of the forestry sector to nature conservation

Of the total of legally gazetted forestry land administered by the forestry sector, some 34% or 3.6% of the total area is administered for protection or conservation purposes. These figures are approximate because of

the close linking of wildlife and conservation sectors in the subregion which makes distinction between the two sectors unclear in some countries. Also, in some countries, there are restrictions, based on legislation or on policy, within parts of the land under commercial use - such restrictions often have a role in protection or conservation. In Paraguay, a 100m-wide belt of protected forest is to be left on both sides of rivers, streams, water courses and lakes. In Guyana, the felling of trees is also restricted on steep slopes.

13.5 FUTURE PROSPECTS

13.5.1 Expanding the Conservation Area Network

Official proposals to expand the conservation area network total some 11.7 million ha or 0.8% of the total area of the subregion (Table 13.3), although the strength of these proposals varies, and there are undoubtedly other proposals which have not been included. In Guyana, for example, the present policy aims to set aside not more than 10% of its forested area as a conservation area system, i.e. some 4,000,000ha. With the exception of Kaieteur National Park extension, sites have not yet been specified, so most of this proposed area has not been included in the table.

Detailed lists of proposed sites exist for a number of countries including Peru, French Guiana, Paraguay, and Suriname (Annex 13.2), but further information concerning these proposals is unavailable.

13.5.2 Other National Initiatives

Strengthening networks A number of countries have considerable difficulty in maintaining their existing conservation areas network, and many of these countries have little in the way of new initiatives either to strengthen or expand existing networks. New legislation is being drafted, or has been recently approved, in a number of countries. A General Environment Law is being considered in Bolivia, with proposals for the establishment of a new Secretariat of the Environment at the ministerial level, and for the unification of the country's conservation areas into a single national system. A similar Protected Natural Areas Law has been proposed for Venezuela. Brazil is attempting to consolidate its managed areas system into a single unified classification system. Suriname is undertaking to strengthen its conservation areas network through a number of initiatives, including personnel training and encouraging environmental education.

Overcoming Economic Constraints As mentioned, funding is a major factor which often limits the effective management of conservation areas. Apart from a few specific sites, notably in Venezuela and Peru, tourism is not a major source of income.

International interest in the region is extremely high, due to the high biodiversity, wealth of natural resources and rapid destruction of many ecosystems. Large amounts of funding are thus available from international, multinational and binational agencies, as well as from numerous non-governmental organisations.

One development in the region has been the formulation of debt-for-nature swaps, whereby the national debts of a country are reduced in exchange for some conservation activities. Such projects have been discussed by a number of countries, and some have been officially rejected. Bolivia and Ecuador, however, have both undertaken such projects in cooperation with Conservation International and WWF-International, respectively. In Bolivia these exchanges have led to the expansion and increased protection of Beni Biosphere Reserve, and in Ecuador the amount of recovered debt now amounts to US\$ 9 million, which has gone towards a number of conservation initiatives. These exchanges are not without controversy - they are seen by some as compromising national sovereignty, as excessive foreign intervention or as debt for territory exchange.

Improving Management Efforts to improve management are mentioned in a number of policy plans, and are central to at least some of the new legislation in the region. This is also the aim of a number of the

international initiatives mentioned above. One of the major limiting factors to this is, however, a severe shortage of funding in almost every country.

13.5.3 International Initiatives

Conventions and Programmes Most countries within the region participate in one or more international conventions and programmes concerned with conservation areas (Table 13.5). All countries except Suriname have accepted or ratified the Convention Concerning the World Cultural and Natural Heritage, but only Brazil, Ecuador and Peru have natural properties inscribed in the World Heritage List, several of which are outstanding examples of tropical rain forest.

Bolivia, Ecuador, Suriname and Venezuela have acceded to or ratified the Ramsar Convention. Most of the wetlands designated under the Convention are coastal, and a number incorporate important mangrove communities.

Several countries have set up National MAB Committees under the Unesco Man and the Biosphere Programme. Sites in Bolivia, Brazil, Colombia, Ecuador and Peru have been accepted as biosphere reserves.

French Guiana is a party to all of these conventions and initiatives, as an administrative part of France, but as yet no sites have been designated under any of them.

The eight countries with territories in the Amazon region signed the Amazon Cooperation Treaty, which was adopted in Brasilia in 1978 and entered into force in 1980. This treaty aims to establish regulations for managing natural resources and to propose conservation-directed alternatives to the management of multinational projects. Joint programmes have been developed through this treaty, and the participants have recommended the creation of a number of transborder conservation areas in the Amazon basin, with joint management, planning, research and information exchange. The only countries in the subregion which are not signatories to this Treaty are French Guiana and Paraguay.

Other regional treaties, which include areas beyond the boundaries of the subregion, are the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Western Hemisphere Convention) and the Convention for the protection and Development of the Marine Environment of the Wider Caribbean Region which, with its related protocols, is known as the Cartagena Convention. French Guiana and Guyana are the only areas which are not parties to the former convention. Protocols associated with the latter include the Protocol Concerning Co-operation in Combatting Oil Spills in the Wider Caribbean Region and the Protocol Concerning Specially Protected Areas and Wildlife which was largely signed in 1991, but is yet to be ratified. This convention has been signed by Colombia, France and Venezuela.

Cooperative agreements An Action Plan for the Environment in Latin America and the Caribbean, prepared by the United Nations Environment Programme, was approved in October 1990 at the Seventh Departmental Meeting about the Environment in Latin America and the Caribbean. Included in the Action Plan are programmes for the protection of natural areas and of the cultural heritage; the management of national and international river basins; the conservation of biological diversity; environmental education; development and environmental planning; and the management of protected areas.

A recent initiative has been established by The Nature Conservancy in the US, in conjunction with government and non-government organisations in Latin America and the Caribbean. Called 'Parks in Peril, a Conservation Partnership for the Americas', the partnership intends to select 20 critical sites each year for ten years, and to provide comprehensive on-site conservation management, to prevent any deterioration of their quality.

There is a small number of transboundary parks in the subregion, although the concept is not well developed. Currently listed sites include El Tama (Venezuela and Colombia) and Serrania Neblina/Pico da Neblina (Venezuela and Brazil) both of which contain important areas of forest. A third forested site,

Darien/Los Katios, exists between Colombia and Panama in the Central American subregion. None of these sites has joint management.

13.6 PRIORITIES FOR ACTION

A number of priorities for the wider region were established in the Action Plan for the Environment in Latin America and the Caribbean described above. Priorities specifically for South America have been reviewed more recently by IUCN (1992) in preparation for the IV World Parks Congress. These have been distilled into 11 'Actions' which are as follows: to improve the management of protected areas; to update existing legislation; to increase economic funds for protected areas and to make those already existing more efficient; to promote the integration of communities to conservation actions; to increase the area and representativeness of protected areas; to improve the available information about protected areas; to intensify research into protected areas; to promote regional cooperation; to improve the participation in international conservation systems and to participate in international treaties and conventions; to improve environmental education and to launch conservation campaigns with different approaches.

The translation of priorities into action will vary according to national conservation objectives, history and political will. They provide a foundation to the more specific priorities identified in this report and are summarised in Table 13.6.

In conclusion, the subregion has one of the most extensive networks of protected forests in the world, a network that has shown a remarkable expansion since its beginnings earlier this century. Despite the considerable extent of the network to date, large areas of forest in the subregion still remain unprotected, and a number of countries must still expand their networks. Perhaps the greatest challenge facing countries in the subregion is to consolidate and strengthen their networks by improving managed areas management and administration. Alongside this must be the challenge of raising the profile of environmental issues on the national agendas of these countries, increasing awareness among the populations, and increasing funding from national and international sources.

REFERENCES

- Goitia (1988). Recursos Forestales. In: Diagnóstico de la Diversidad Biológica de Bolivia. (Unpublished report). Centro de Datos para la conservacion (CDC-Bolivia). Pp. 22-41.
- IUCN (1992). *Parks for life: proceedings of the IV World Parks Congress on National Parks and Protected Areas*. IUCN, Gland, Switzerland. 250 pp.
- IUCN/ITTO (1991). *Conserving Biodiversity in managed Tropical Forests*. Latin American Draft Report. 85 pp.
- MARNR (1992). *Areas Naturales Protegidas de Venezuela*. Serie Aspectos Conceptuales y Metodológicos DGSPOA/ACM/01.
- WCMC (1992). *Protected areas of the world: a review of national systems*. Volume 4 Nearctic and Neotropical. Draft: South America. 142 pp.

Table 13.1 Legal provisions for protected areas, with year of enactment and responsible administrative authority. Protected areas are classified according to management objective (T = total protection, P = partial protection, L = local extractive use, C = commercial extractive use).

Country	Year	Legislation Title [Sector]	Administrative authority	Managed areas Man. Designation
Bolivia	1974	Ley General Forestal Decreto No. 11686 (F)	Centro de Desarrollo Forestal	P Bosque de uso multiple
				P Bosque especial
				C Bosque permanente de producción
				T Bosque permanente de protección
				P Reserva forestal de inmovilización
	1975	Ley de Vida Silvestre, Parques Nacionales, Caza y Pesca Decreto Ley No. 12301 (W)	Departamento de Vida Silvestre, Parques Nacionales, Caza y Pesca, Centro de Desarrollo Forestal	P Coto de caza
				T Parque nacional
				T Refugio de fauna silvestre
				T Reserva de vida silvestre
				T Santuario de vida silvestre
	Various	Decrees (W)	Departamento de Vida Silvestre, Parques Nacionales, Caza y Pesca, Centro de Desarrollo Forestal	T Reserva natural de vida silvestre
				T Reserva nacional de vida silvestre
				T Reserva fiscal
				T Estación biológica
				P Parque regional
	Legislation unknown (W)		Departamento de Vida Silvestre, Parques Nacionales, Caza y Pesca, Centro de Desarrollo Forestal	P Reserva
				P Zona de protección

Country	Legislation Year	Title [Sector]	Administrative authority	Managed areas Man. Designation
Brazil	1965	Decree Law No. 25 [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	P Monumento natural
	?	Legislation unknown [F]	?	P Forest park P Forest reserve P Forest station P Municipal park P State extractivist forest T State forest park P State forest park
	1979	Decree No. 84.017 [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	T Parque nacional
	1984	Decree No. 89.336 [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	T Reserva ecológica
	1990	Decree No. 98.914 [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	P Reserva particular do ?
	1937	Decree Law No. 25 [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	P Monumento natural
	1967	Law No. 5197 on the protection of fauna and other provisions [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	P Parque de caça federal, estadual e municipal T Reserva biológica nacional, estadual e municipal
	1977	Law No. 6.513 [W]	?	P Area especial de interesse turístico e local de interesse turístico
	1981	Law No. 6.902 modified by Decree No. 99.274 (1990) [W]	Instituto Brasileiro do Meio Ambiente y dos Recursos Naturais Renováveis	P Area de proteção ambiental T Estação ecológica

Country	Legislation Year	Legislation Title [Sector]	Administrative authority	Managed areas Man. Designation
	?	Legislation unknown [W]	?	<p>P Area of outstanding ecological interest</p> <p>P Area of outstanding natural interest</p> <p>P Ecological park</p> <p>P Faunal reserve</p> <p>P Municipal natural park</p> <p>P Park</p> <p>P Protected area</p> <p>P Special biosphere reserve</p> <p>P Specially protected area</p> <p>P State reserve</p> <p>P Wildlife sanctuary</p> <p>P Monumento arqueológico o pre-histórico</p> <p>P Historical sanctuary</p> <p>P Protected watershed</p>
Colombia	?	Legislation unknown [F]	?	<p>P Protected forest reserve</p> <p>T Area natural única</p> <p>T Parque nacional</p> <p>T Reserva natural</p> <p>T Santuario de fauna</p> <p>T Santuario de flora</p> <p>T Vía parque</p> <p>P Special management area</p>
	1974	Código Nacional de Recursos Naturales Renovables y de Protección al Medio Ambiente Decree Law No. 2811 [W]	Instituto Nacional de los Recursos Naturales Renovables y del Medio Ambiente	<p>L Indigenous reserve</p> <p>L Resguardo</p>
	?	Legislation unknown [W]	Instituto Nacional de los Recursos Naturales Renovables y del Medio Ambiente	
	?	Legislation unknown [A]	?	

Country	Legislation Year	Title [Sector]	Administrative authority	Managed areas Man. Designation
Ecuador	1981	Ley Forestal y de Conservación de áreas naturales y vida silvestre [W + F]	Ministerio de Agricultura y Ganadería	P P C P T T T T T P
	1979	Acuerdo Interministerial No. 0322 [W]	Ministerio de Agricultura y Ganadería/ Ministry of Industry, Commerce and Integration	Area nacional de recreación Parque nacional Reserva ecológica Reserva de producción faunística
	Various	Decrees [W]	Ministerio de Agricultura y Ganadería	Area nacional de recreación Parque nacional Reserva ecológica Reserva de producción faunística
				Reserva geobotánica Reserva de recursos marinos Reserva forestal de asentamiento comunal
French Guiana	1976/7	Loi No. 76/629 relative à la protection de la nature & Decrees for its implementation [W]	Directorate for Nature Conservation	P P
	?	Legislation unknown [W]	?	P State biological reserve
Guyana	1977	National Parks Commission Act [W]	National Parks Commission	T
	?	Legislation unknown [A]	?	L Amerindian land

Country	Legislation		Administrative authority	Managed areas	
	Year	Title [Sector]		Man.	Designation
Paraguay	1973	Ley Forestal No. 422 [F]	Servicio Forestal Nacional	C T P	Bosque de producción Bosque especial Bosque protector
	?	Legislation unknown [W]	?	P P T P	Biological refuge Biological reserve National reserve Scientific monument
	1975	Reglamento de la Ley Forestal No. 422 [W]	Dirección de Parques Nacionales y Vida Silvestre	T	Parque nacional
	1977	Reglamento de Conservación de Flora y Fauna Silvestre Decreto 158-77 [F]	Ministerio de Agricultura	P L P	Coto de caza Reserva comunal Zona reservada
Peru	1975	Ley Forestal y de Fauna Silvestre Decreto Ley No. 21147 [F + W]	Ministerio de Agricultura	C P C T P P T	Bosque de libre disponibilidad Bosque de protección Bosque nacional Parque nacional Reserva nacional Santuario histórico Santuario nacional
	1947	Forest Law [F]	Forest Service, Ministry of Natural Resources	C	Forest reserve
	?	Legislation unknown [W]	Forest Service, Ministry of Natural Resources	P T	Multiple use management area Nature park
Suriname	1954	Nature Conservation Law [W]	Forest Service, Ministry of Natural Resources	P	Nature reserve

Country	Legislation Year	Title [Sector]	Administrative authority	Managed areas Man. Designation
Venezuela	1964	Decreto No. 156 Reglamento Parcial de la Ley Forestal de Suelos y Aguas [F]	Ministerio de Agricultura y Cría	C Reserva forestal
	?	Legislation unknown [F]	?	P Forest plot
	1965	Ley Forestal de Suelos y Aguas [F + W]	Ministerio de Agricultura y Cría	P Area de protección Parque nacional
	1983	Ley Orgánica para la Ordenación del Territorio [F + W]	Various institutions	T Area boscosa baja protección Area crítica
				P Area de manejo integral de recursos naturales
				C Area de protección y recuperación ambiental
				P Monumento natural
				T Parque litoral
				T Parque nacional
				T Refugio de fauna silvestre
				L Reserva de biósfera
				P Reserva de fauna silvestre
				C Reserva forestal
				P Reserva nacional hidráulica
				P Santuario de fauna silvestre
				P Sitio de patrimonio histórico-cultural o arqueológico
				P Zona de interés turístico
				P Zona protectora

In a number of cases, notably in Brazil, the categories of protected areas do not fully correspond to those used in Table 13.3 and the maps. This is an unfortunate result of using numerous sources for the different information presented in this document - these have different dates, some are in the local language, others translated into English. In some cases, categories may be regional rather than national in application. While it is likely that the categories used in Table 13.3 and the maps correspond to those of a similar title used in this table, it has not been possible to verify this.

Table 13.2 Extent of notified natural forests, classified by forest function. Units are in sq. km, followed by % total area. Full data, with sources, are given in Annex 13.2.

Country SUBREGION	Total Area	F O R E S T F U N C T I O N			T o t a l
		Production	Protection	Conservation	
Bolivia	1,098,580	64,122 (5.8)	0 (0.0)	85,582 (7.8)	149,704 (13.6)
Brazil	8,511,970	143,007 (1.7)	0 (0.0)	224,441 (2.6)	367,448 (4.3)
Colombia	1,138,910	440,809 (38.7)	3,500 (0.3)	0 (0.0)	444,309 (39.0)
Ecuador	283,560	80,700 (28.5)	21,840 (7.7)	0 (0.0)	102,540 (36.2)
French Guiana	90,000	15,000 (16.7)	0 (0.0)	0 (0.0)	15,000 (16.7)
Guyana	214,970	91,000 (42.3)	0 (0.0)	0 (0.0)	91,000 (42.3)
Paraguay	406,750	7 (0.0)	0 (0.0)	20 (0.0)	27 (0.0)
Peru	1,285,220	32,269 (2.5)	3,900 (0.3)	35,964 (2.8)	72,133 (5.6)
Suriname	163,270	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Venezuela	912,050	141,063 (15.5)	136,028 (14.9)	0 (0.0)	277,091 (30.3)
TROPICAL SOUTH AMERICA					
	14,105,280	1,007,977 (7.1)	165,268 (1.2)	346,007 (2.5)	1,519,252 (10.8)

Table 13.3 Extent of notified and proposed conservation areas, classified by sector and national designation. Management categories are assigned to designations based on national legislation (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses). Totals for proposed sites may include areas of properties already protected but proposed for upgrading to higher conservation status. Details of individual properties are given in Annex 2. N is the total number of conservation areas.

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
BOLIVIA (1,098,580 sq. km)					
Forest Sector					
Closed Forest Reserve	P	5	7,893,195	0	0
Protection Forest Reserve	T	3	665,000	0	0
Subtotals		8	8,558,195	0	0
(% total area)			(7.8)		(0.0)
Wildlife Sector					
Biological Station	T	1	135,000	0	0
Fiscal Reserve	P	3	780 *	0	0
National Park	T	10	4,133,496	2	100,000 *
Protection Zone	P	0	0	1	225
Regional Park	P	4	393,450	0	0
Reserve	T	2	240,429	0	0
Sanctuary	T	2	1,537	0	0
Wildlife Refuge	T	4	281,000	0	0
Wildlife Reserve	T	11	5,076,840 *	0	0
Subtotals		37	10,262,532 *	3	100,225 *
(% total area)			(9.4)		(0.1)
Totals		45	18,820,727 *	3	100,225 *
(% total area)			(17.2)		(0.1)
BRAZIL (8,511,970 sq. km)					
Forest Sector					
Biological Reserve	T	20	1,795,789 *	0	0
Forest Park	P	2	437	0	0
Forest Reserve	P	21	14,705,082 *	0	0
Forest Station	P	3	500	0	0
Municipal Park	P	8	6,443	0	0
Protection Forest	P	1	0 *	0	0
State Extractivist Forest	P	3	1,438,906	0	0
State Forest Park	T	4	19,817 *	0	0
State Forest Reserve	P	2	34,526	0	0
State Park	P	85	4,442,620 *	1	69
Subtotals		149	22,444,120 *	1	69
(% total area)			(2.6)		(0.0)
Wildlife Sector					
Area of Outstanding Ecological	P	10	23,658	0	0
Area of Outstanding Natural	P	2	4,420	0	0
Ecological Park	P	2	1,274	0	0
Ecological Reserve	T	49	2,083,314	0	0
Ecological Station	P	22	3,441,756 *	3	321,544
Environmental Protection Area	P	31	1,651,539 *	0	0
Faunal Reserve	P	2	24,610	0	0
Federal Biological Reserve	T	13	158,269	0	0
Federal Ecological Reserve	T	1	200	0	0

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Federal Ecological Station	P	22	1,581,118	0	0
Federal Environment Protection	P	10	1,153,481	0	0
Municipal Natural Park	P	1	44	0	0
National Park	T	35	11,902,200	0	0
Park	P	4	465 *	0	0
Protected Area	P	1	688	0	0
Special Biosphere Reserve	P	1	2,216	0	0
Specially Protected Area	P	3	12,000 *	0	0
State Biological Reserve	T	38	1,000,057	0	0
State Ecological Reserve	P	5	3,545 *	0	0
State Ecological Station	P	22	52,710	0	0
State Environment Protection	P	16	1,971,018 *	0	0
State Reserve	P	17	79,150	0	0
Wildlife Sanctuary	P	3	0 *	0	0
Subtotals		310	25,147,732 *	3	321,544
(% total area)			(2.8)		(0.0)
Additional Sector, or sector unknown					
Anthropological Reserve	P	12	17,000 *	0	0
Extractivist Reserve	P	23	4,252,557	0	0
Historical Sanctuary	P	1	1,550	0	0
Indigenous Area	P	267	70,189,476 *	0	0
Indigenous Colony	P	3	0 *	0	0
Indigenous Park	P	5	15,747,276	0	0
Indigenous Reserve	P	16	3,572,309 *	0	0
Other area	P	8	268,684	5	0 *
Protected Watershed	P	1	1,833	0	0
Subtotals		336	94,050,685 *	5	0 *
(% total area)			(11.0)		(0.0)
Totals		795	141,642,537 *	9	321,613 *
(% total area)			(16.4)		(0.0)
COLOMBIA (1,138,910 sq. km)					
Forest Sector					
Protected Forest Reserve	P	45	350,000	0	0
Subtotals		45	350,000	0	0
(% total area)			(0.3)		(0.0)
Wildlife Sector					
Fauna and Flora Sanctuary	T	6	55,358	2	15,000 *
Natural National Park	T	33	7,043,790	10	2,150,530 *
Natural National Reserve	T	2	1,947,000	0	0
Natural Reserve	T	1	2,045	0	0
Natural Unique Area	T	1	640	0	0
Special Management Area	P	3	1,522,549	0	0
Subtotals		46	10,571,382	12	2,165,530 *
(% total area)			(9.2)		(1.9)
Additional Sector, or sector unknown					
Indigenous Reserve	P	28	7,954,648	0	0
Resguardo	P	262	17,121,959 *	0	0
Subtotals		290	25,076,607 *	0	0
(% total area)			(22.0)		(0.0)
Totals		381	35,997,989 *	12	2,165,530 *
(% total area)			(31.5)		(1.9)

COUNTRY	Man.	Notified		Proposed	
Sector	Cat.				
National designation		N	Area(ha)	N	Area(ha)
ECUADOR (283,560 sq. km)					
Forest Sector					
Forest Reserve	P	1	101,000	0	0
Protected Forest	P	77	2,083,036 *	0	0
Subtotals		78	2,184,036 *	0	0
(% total area)			(7.7)		(0.0)
Wildlife Sector					
Biological Reserve	T	1	4,613	0	0
Ecological Reserve	T	3	642,565	0	0
Faunal Production Reserve	P	2	312,760	0	0
Geobotanical Reserve	T	1	3,383	0	0
Marine Resource Reserve	P	1	7,990,000	0	0
National Park	T	6	1,952,842	0	0
National Recreation Area	P	2	29,885	0	0
Subtotals		16	10,936,048	0	0
(% total area)			(38.6)		(0.0)
Totals		94	13,120,084 *	0	0
(% total area)			(46.3)		(0.0)
FRENCH GUIANA (90,000 sq. km)					
Wildlife Sector					
Biogenetic Reserve	P	0	0	1	0 *
Nature Reserve	P	1	0 *	16	3,105,930
Protected Biotope	P	1	79,200	0	0
State Biological Reserve	P	5	429,000	0	0
Subtotals		7	508,200 *	17	3,105,930 *
(% total area)			(5.7)		(34.5)
Totals		7	508,200 *	17	3,105,930 *
(% total area)			(5.7)		(34.5)
GUYANA (214,970 sq. km)					
Wildlife Sector					
National Park	T	1	58,559	1	340,000
Subtotals		1	58,559	1	340,000
(% total area)			(0.3)		(1.6)
Additional Sector, or sector unknown					
Amerindian Lands	P	65	1,390,562	0	0
Subtotals		65	1,390,562	0	0
(% total area)			(6.5)		(0.0)
Totals		66	1,449,121	1	340,000
(% total area)			(6.8)		(1.6)
PARAGUAY (406,750 sq. km)					
Forest Sector					
Protection Forest	P	2	2,000	0	0
Subtotals		2	2,000	0	0
(% total area)			(0.0)		(0.0)
Wildlife Sector					
Biological Refuge	P	2	3,601	0	0
Biological Reserve	P	2	25,592	0	0
National Park	T	9	1,173,938	2	0 *
National Reserve	T	2	103	0	0

COUNTRY Sector National designation	Man. Cat.	Notified		Proposed	
		N	Area(ha)	N	Area(ha)
Protected Area	P	0	0	24	1,486,410 *
Scientific Monument	P	1	200	0	0
Subtotals		16	1,203,434	26	1,486,410 *
(% total area)			(3.0)		(3.7)
Totals		18	1,205,434	26	1,486,410 *
(% total area)			(3.0)		(3.7)
PERU (1,285,220 sq. km)					
Forest Sector					
Communal Reserve	P	1	34,744	0	0
Hunting Reserve	P	2	124,735	0	0
Protection Forest	P	6	389,987	0	0
Reserve Zone	P	7	3,436,891	0	0
Subtotals		16	3,986,357	0	0
(% total area)			(3.1)		(0.0)
Wildlife Sector					
Historical Sanctuary	P	3	35,392	0	0
National Park	T	7	2,381,126	3	2,600,000
National Reserve	P	8	2,946,686	2	125,000
National Sanctuary	T	7	150,222	6	728,625
Subtotals		25	5,513,426	11	3,453,625
(% total area)			(4.3)		(2.7)
Totals		41	9,499,783	11	3,453,625
(% total area)			(7.4)		(2.7)
SURINAME (163,270 sq. km)					
Wildlife Sector					
Multiple Use Management Area	P	1	68,320	2	620,000
Nature Park	T	1	8,400	0	0
Nature Reserve	P	13	727,670	2	122,000
Subtotals		15	804,390	4	742,000
(% total area)			(5.0)		(4.5)
Totals		15	804,390	4	742,000
(% total area)			(5.0)		(4.5)
VENEZUELA (912,050 sq. km)					
Forest Sector					
Critical Priority Area	P	5	1,633,045	0	0
Protective Zone	P	47	11,969,759 *	0	0
Subtotals		52	13,602,804 *	0	0
(% total area)			(14.9)		(0.0)
Wildlife Sector					
Biosphere Reserve (National)	P	2	9,276,500	0	0
Faunal Refuge	T	7	96,955	0	0
Faunal Reserve	P	2	87,831	0	0
Littoral Park	T	2	45	0	0
National Park	T	39	12,629,812	10	0 *
Natural Monument	T	17	1,120,866	2	0 *
Subtotals		69	23,212,009	12	0 *
(% total area)			(25.4)		(0.0)
Totals		121	36,814,813 *	12	0 *
(% total area)			(40.3)		(0.0)

COUNTRY	Man.	Notified		Proposed	
Sector	Cat.	N	Area(ha)	N	Area(ha)
National designation					
TROPICAL SOUTH AMERICA (14,105,280 sq. km) - summary by sector					
Forestry Sector		350	51,127,512 *	1	69
(% total area)			(3.6)		(0.0)
Wildlife Sector		542	88,217,712 *	89	11,715,264 *
(% total area)			(6.3)		(0.8)
Additional Sector or sector unknown		691	120,517,854 *	5	0 *
(% total area)			(8.5)		(0.0)
TROPICAL SOUTH AMERICA (14,105,280 sq. km) - summary by management category					
Total protection		339	56,765,210 *	38	5,934,155 *
(% total area)			(4.0)		(0.4)
Partial protection		1244	203,097,868 *	57	5,781,178 *
(% total area)			(14.4)		(0.4)
Degree of protection unknown		0	0	0	0
(% total area)			(0.0)		(0.0)
Totals		1583	259,863,078 *	95	11,715,333 *
(% total area)			(18.4)		(0.8)

* Subtotal is incomplete because of missing data for either number of sites or area covered.

Table 13.4(a) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
a) Forestry Sector							
BOLIVIA							
Notified sites	T	3	221,666	0	0	1	2
	P	5	1,578,639	0	0	0	5
	Total	8	1,069,774	0	0	1	7
BRAZIL							
Notified sites	T	21	86,457	8	4	4	5
	P	119	173,348	40	37	24	18
	Total	140	160,315	48	41	28	23
Proposed sites	P	1	69	1	0	0	0
	Total	1	69	1	0	0	0
ECUADOR							
Notified sites	P	75	29,519	25	31	10	9
	Total	75	29,519	25	31	10	9
PARAGUAY							
Notified sites	P	2	1,000	2	0	0	0
	Total	2	1,000	2	0	0	0
PERU							
Notified sites	P	16	249,147	2	4	5	5
	Total	16	249,147	2	4	5	5
VENEZUELA							
Notified sites	P	51	266,721	5	10	17	19
	Total	51	266,721	5	10	17	19
TROPICAL SOUTH AMERICA							
Notified sites	T	24	103,358	8	4	5	7
	P	268	180,324	74	82	56	56
	Total	292	173,998	82	86	61	63
Proposed sites	P	1	69	1	0	0	0
	Total	1	69	1	0	0	0

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 13.4(b) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
b) Wildlife Sector							
BOLIVIA							
Notified sites	T	29	340,286	1	2	11	15
	P	5	78,846	2	0	1	2
	Total	34	301,839	3	2	12	17
Proposed sites	T	1	100,000	0	0	1	0
	P	1	225	1	0	0	0
	Total	2	50,112	1	0	1	0
BRAZIL							
Notified sites	T	136	111,353	67	24	26	19
	P	163	61,372	44	52	42	25
	Total	299	84,106	111	76	68	44
Proposed sites	P	3	107,181	1	0	0	2
	Total	3	107,181	1	0	0	2
COLOMBIA							
Notified sites	T	43	210,437	3	4	18	18
	P	3	507,516	0	0	1	2
	Total	46	229,812	3	4	19	20
Proposed sites	T	8	270,691	1	0	3	4
	Total	8	270,691	1	0	3	4
ECUADOR							
Notified sites	T	11	236,673	0	2	3	6
	P	5	1,666,529	0	1	2	2
	Total	16	683,503	0	3	5	8
FRENCH GUIANA							
Notified sites	P	6	84,700	0	1	2	3
	Total	6	84,700	0	1	2	3
Proposed sites	P	16	194,120	0	5	6	5
	Total	16	194,120	0	5	6	5
GUYANA							
Notified sites	T	1	58,559	0	0	1	0
	Total	1	58,559	0	0	1	0
Proposed sites	T	1	340,000	0	0	0	1
	Total	1	340,000	0	0	0	1
PARAGUAY							
Notified sites	T	11	106,731	3	1	5	2
	P	5	5,878	1	2	2	0
	Total	16	75,214	4	3	7	2
Proposed sites	P	22	67,564	1	4	15	2
	Total	22	67,564	1	4	15	2

		N	Mean size (ha)	Number in each size class (ha)			
				≤1000	1001- 10,000	10001- 100,000	>100,000
b) Wildlife Sector							
PERU							
Notified sites	T	14	180,810	1	5	3	5
	P	11	271,098	1	3	4	3
	Total	25	220,537	2	8	7	8
Proposed sites	T	9	369,847	1	1	3	4
	P	2	62,500	0	0	2	0
	Total	11	313,965	1	1	5	4
SURINAME							
Notified sites	T	1	8,400	0	1	0	0
	P	14	56,856	1	2	9	2
	Total	15	53,626	1	3	9	2
Proposed sites	P	4	185,500	0	0	2	2
	Total	4	185,500	0	0	2	2
VENEZUELA							
Notified sites	T	65	213,041	11	10	26	18
	P	4	2,341,082	0	0	2	2
	Total	69	336,405	11	10	28	20
TROPICAL SOUTH AMERICA							
Notified sites	T	311	174,548	86	49	93	83
	P	216	157,097	49	61	65	41
	Total	527	167,396	135	110	158	124
Proposed sites	T	19	312,323	2	1	7	9
	P	48	120,439	3	9	25	11
	Total	67	174,854	5	10	32	20

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 13.4(c) Frequency distributions of notified and proposed conservation area sizes, with means, classified by management category (P = partial protection with local, sustainable extractive uses; T = total protection with no extractive uses), for (a) Forestry, (b) Wildlife and (c) Additional sectors.

		N	Mean size (ha)	Number in each size class (ha)			
c) Additional Sector(s)				≤1000	1001- 10,000	10001- 100,000	>100,000
BRAZIL							
Notified sites	P	272	345,774	24	47	82	119
	Total	272	345,774	24	47	82	119
COLOMBIA							
Notified sites	P	287	87,374	34	140	91	22
	Total	287	87,374	34	140	91	22
TROPICAL SOUTH AMERICA							
Notified sites	P	559	213,107	58	187	173	141
	Total	559	213,107	58	187	173	141

Note that N (the total number of conservation areas) does not necessarily equate to N in Table 3, because the areas of some individual sites may be unknown.

Countries for which there are no relevant data are not included in the table.

Table 13.5 State parties to international (and regional) conventions or programmes concerning the conservation of natural areas, together with the number of properties (natural of mixed natural/cultural in the case of the World Heritage Convention) recognised under respective conventions in brackets.

	World Heritage Convention	Biosphere Reserves ¹	Ramsar Convention	Cartagena Convention ¹	Western Hemisphere Convention ²	Amazon Cooperation Treaty
Bolivia	1976 (0)	1977 (3)	1990 (1)	-	1940	1978
Brazil	1977 (1)	1991 (2)	-	-	1940	1978
Colombia	1983 (0)	1979 (3)	-	1988	1940	1978
Ecuador	1975 (2)	1984 (2)	1990 (2)	-	1940	1978
French Guiana	-	-	-	1985	-	-
Guyana	1977 (0)	-	-	-	-	1978
Paraguay	1988 (0)	-	-	-	1940	-
Peru	1982 (4)	1977 (3)	-	-	1940	1978
Suriname	-	-	1985 (1)	-	1940	1978
Venezuela	1990 (0)	-	1988 (1)	1986	1940	1978

¹The Convention for the protection and Development of the Marine Environment of the Wider Caribbean Region, with its related protocols, is known as the Cartagena Convention, including the Protocol Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region and the Protocol Concerning Specially Protected Areas and Wildlife which was largely signed in 1991, but is yet to be ratified. The date given is the date of ratification or accession.

²The Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Western Hemisphere Convention). The date given is the date of original signature.

Table 13.6 Summary of national priorities for action relating to conservation areas.

COUNTRY	Legislation	Completing the network	Managing the network
Bolivia	Strengthen legislation, notably conservation area category definitions and regulations	Extend to valleys and semi-arid mountains; semi-arid puna south of the Chaco; semi-arid, lowland and mountainous forest	Strengthen and give more autonomy to Wildlife, National Parks, Hunting and Fishing Department
Brazil	Rationalise, consolidate and strengthen at the national and state levels	Comprehensively review network at national and state level	Strengthen the Brazilian Institute for the Environment and Natural Renewable Resources and site management at all sites
Colombia		Extend to Choco biogeographic province in the Pacific	Establish a national conservation strategy to coordinate conservation efforts; strengthen National Parks Division
Ecuador	Coordinate and strengthen existing policy and legislation; clarify conservation area definitions	Extend in the coastal plain region, including mangrove areas	Strengthen funding and hierarchical status of Ministry of Agriculture and Livestock, and relevant bodies therein
French Guiana	Apply existing French legislation; adapt this specifically for French Guiana	Establish a representative network	Create stronger sections of existing French administrative bodies within French Guiana; develop a relevant conservation strategy
Guyana	Enact further legislation	Establish a representative network	Develop a stronger institutional framework for conservation area administration
Paraguay	Coordinate and strengthen existing policy and legislation; clarify conservation area definitions	Comprehensively review network; extend to the eastern region	
Peru	Simplify mechanisms for establishing conservation areas	Improve representation of marine and coastal regions and high altitude Puna	Strengthen the General Directorate of Forestry and Fauna

Suriname	Increase range and number of categories of conservation areas	Extend to ecosystems not currently covered and expand existing system	
Venezuela	Consolidate and simplify existing conservation areas system		Strengthen management agencies

Annex 13.1 List of conservation areas. Locations of most notified conservation areas are shown in the accompanying maps in Part III

BOLIVIA

Biological Station

1 Beni		135,000	1982
Subtotal	1 site	135,000 ha	

Closed Forest Reserves

2 Chiquitania		5,774,000	1977
3 Convendo		249,195	1984
4 Itenez		1,500,000	1988
5 Rio Boppi		128,000	1979
6 Rio Grande Masicuri		242,000	1979
Subtotal	5 sites	7,893,195 ha	

Fiscal Reserves

7 Cerro Tapilla			1940
8 Lagunas Alalay y Angostura		780	1940
9 Rio Pilcomayo			1979
Subtotal	3 sites	780 ha*	

National Parks

10 Amboro		637,600	1973
11 Carrasco Ichilo		1,300,000	1988
12 Isiboro Secure		1,100,000	1965
13 Llica		97,500	1991
14 Noel Kempf Mercado		914,000	1979
15 Sajama		29,940	1939
16 Santa Cruz la Vieja		17,080	1989
17 Torotoro		16,576	1989
18 Tunari		6,000	1962
19 Tuni Condoriri		14,800	1942
Subtotal	10 sites	4,133,496 ha	

Protection Forest Reserves

20 Bella Vista		90,000	1964
21 Eva Eva - Mosetenes		225,000	1990
22 Sajta Ichilo		350,000	1988
Subtotal	3 sites	665,000 ha	

Regional Parks

23 El Pirai		250,000	1984
24 Lomas Arena		13,300	1989
25 Sehuencas		150	1988
26 Yacuma		130,000	1987
Subtotal	4 sites	393,450 ha	

Reserves

27 Altamachi Vicuna		100,000	1977
28 Huancaroma Vicuna		140,429	1975
Subtotal	2 sites	240,429 ha	

Sanctuaries

29 Cavernas El Repechon		1,500	1986
30 Flavio Machicado Vizcarra		37	1963
Subtotal	2 sites	1,537 ha	

Wildlife Refuges

31 El Dorado		180,000	1988
32 Estancias Elsner Espirita		70,000	1978
33 Estancias Elsner San Rafael		20,000	1978
34 Huancaroma		11,000	1975
Subtotal	4 sites	281,000 ha	

Wildlife Reserves			
35	Cordillera de Sama	108,500	1991
36	Eduardo Avaroa	714,000	1973
37	Incacasani Altamachi	23,000	1991
38	Lagunas del Beni y Pando	275,000	1961
39	Manuripi Heath Amazonica	1,884,000	1973
40	Noel Kempff Mercado	21,900	1988
41	Rios Blanco y Negro	1,400,000	1990
42	Sajama	153,570	1945
43	Tariquia	246,870	1989
44	Ulla Ulla	250,000	1972
45	Yura		1974
	Subtotal	11 sites	5,076,840 ha*
Proposed (National Parks)			
	Caquahuaca		
	Pilon-Lajas	100,000	
	Subtotal	2 sites	100,000 ha*
Proposed (Protection Zone)			
	Cordebeni Hydrographic	225	
	Subtotal	1 site	225 ha
Totals			
	Existing conservation areas	45 sites	18,820,727 ha*
	Proposed conservation areas	3 sites	100,225 ha*

* Subtotal is incomplete because of missing data.

BRAZIL

Anthropological Reserves

1	Alto do Rio Guama		
2	Campa		
3	Campo do Rio Amonia		
4	Caxiuana		
5	Igarape do Pau		
6	Jari		
7	Mangueirinha	17,000	1900
8	Maranava		
9	Nae Maria		
10	Rio Envira		
11	Rio Jordao		
12	Trombetas		
	Subtotal	12 sites	17,000 ha*

Areas of Outstanding Ecological Interest

13	Buriti	83	1990
14	Cabeca do Cachorro	60	1990
15	Corrego Cortado	210	1989
16	Corrego Taquara e Capetinga	2,100	1985
17	Javari-Buriti	15,000	1985
18	Manguezais da Foz do Rio Mamanguape	5,721	1985
19	Paranoa Sul	144	1988
20	Riacho Fundo	144	1988
21	Sao Domingos	163	1990
22	Serra do Tigre	33	1990
	Subtotal	10 sites	23,658 ha

Areas of Outstanding Natural Heritage

23	Fazenda das Almas	3,700	1990
24	Santa Clara	720	1990
	Subtotal	2 sites	4,420 ha

Biological Reserves

25	Abufari	288,000	1982
26	Atol das Rocas (R. Grande do N and Maranhao)	36,249	1979
27	Cuieiras		
28	Fazenda Coringa	580	
29	Fazendinha	193	1984
30	Guapore (with Rondonia)		
31	Guaribas	4,321	1990
32	Ibicui-Mirim	598	1982
33	Ilha da Polvora e das Pombas	17,245	1976
34	Lago Piratuba	357,000	1980
35	Lagoa Grande	38	
36	Lami	100	1975
37	Morro dos Seis Lagos	36,900	1982
38	Parazinho	11	1985
39	Pedra Talhada (Alagoas - Pernambuco)	4,469	1989
40	Rio Trombetas	385,000	1979
41	Sao Camilo	385	1990
42	Serra Geral	1,700	1982
43	Tapirape	103,000	1989
44	Uatuma	560,000	1990
	Subtotal	20 sites	1,795,789 ha*

Ecological Parks

45	Norte Brasilia	174	1990
46	Rio Capivara	1,100	1975
	Subtotal	2 sites	1,274 ha

Ecological Reserves

47	Amparo	173	1987
48	Apiacas	1,513,000	1974
49	Bom Jardim	246	1987

50	Caetes	155	1987
51	Camacari	233	1987
52	Camucin	36	1987
53	Carauna	169	1987
54	Contra Acude	114	1987
55	Curado	101	1987
56	Dois Irmaos	389	1987
57	Dois Unidos	33	1987
58	Duas Lagoas	142	1987
59	Engenho Macaxeira	61	1987
60	Engenho Moreninho	66	1987
61	Engenho Salgadinho	257	1987
62	Engenho Sao Joao	32	1987
63	Engenho Tapacura	335	1987
64	Engenho Uchoa	20	1987
65	Gama	136	1988
66	Guara	147	1988
67	Jaguarana	324	1987
68	Jaguaribe	107	1987
69	Janga	125	1987
70	Jangadinha	76	1987
71	Jardim Botanico	11	1987
72	Jutai-Solimoes	284,285	1983
73	Lanco dos Cacoes	52	1987
74	Manassu	253	1987
75	Manguezais da Lagoa do Roteiro	74,200	1987
76	Miritiba	273	1987
77	Mussaiba	304	1987
78	Outeiro do Pedro	48	1987
79	Parque dos Poderes	140	
80	Passarinho	13	1987
81	Porto Alegre R. Abacate/Uatuma	2,709	1977
82	Quizanga	230	1987
83	Raso da Catarina	200,000	1983
84	Santa Cruz	53	1987
85	Sao Bento	102	1987
86	Sao Vincente da Varzea	52	1987
87	Sauim-Castanheira	109	1982
88	Serra Cotovelo	978	1987
89	Serra Cumarú	367	1987
90	Sistema Gurjau	1,362	
91	Tapacura	94	1987
92	Toro	81	1987
93	Urucu	535	1987
94	Usino Sao Jose	294	1987
95	Zumbi	292	1987
	Subtotal	49 sites	2,083,314 ha
Ecological Stations			
96	Aguas Emendades	9,768	1968
97	Anavilhanas	335,000	1981
98	Aracuri-Esmeralda	272	1981
99	Coco-Javaes		
100	Ilha Maraca-Jipioca	72,000	1981
101	Ilha do Mel	2,240	1982
102	Ique Juruena	160,000	
103	Ique-ripuana		
104	Jari (Amapa and Para States)	227,126	1982
105	Juami-Japura	745,850	1985
106	Jureia-Itatins	80,000	1987
107	Mamanguape	9,992	1982
108	Mamiraua	1,124,000	1990
109	Papagaio	26,788	1990
110	Pau Brazil	1,145	1969
111	Piria-Gurupi (Maranhao & Para)	341,650	1988
112	Rio Acre	77,500	1981
113	Serido	1,116	1982

114 Serra das Araras	115,000	1982
115 Serra dos Tres Irmaos	99,813	1990
116 Taiama	12,000	1981
117 Tripui	496	1978
Subtotal	22 sites	3,441,756 ha*
Environmental Protection Areas		
118 Abaete	1,800	1987
119 Algodual	2,367	1990
120 Bacia do Descoberto (D Federal - Goias)	32,100	1983
121 Bacia do Rio Sao Bartolomeu	84,100	1983
122 Bacias do Gama e Cabeça do Veado	25,000	1986
123 Cachoeira Andorinhas	18,700	1989
124 Cafuringa	30,000	1988
125 Caverna do Moroaga	256,200	1990
126 Cavernas do Peruacu	150,000	1989
127 Floresta do Jacaranda	2,700	1983
128 Gruta dos Brejoes/Vereda do Romao Gramacho	11,900	1985
129 Igarape Gelado	21,600	1989
130 Jericoacoara	6,800	1983
131 Lago Ayapua	610,000	1990
132 Lago Paranoa	16,000	1989
133 Lago do Cuniah	104,000	1989
134 Lagoas de Guarajuba	290	1991
135 Mangaratiba	22,936	1987
136 Mangue-Seco	3,395	1991
137 Mariana	350	1984
138 Marica	740	1984
139 Marituba do Peixe	8,600	1988
140 Massambaba	70	1986
141 Mata do Buraquinho	471	1989
142 Parintins Nhamunda	195,900	1990
143 Piacabucu	5,500	1983
144 Piquiri-Una		
145 Rio Madeira	6,741	
146 Santa Rita	8,800	1984
147 Serra de Baturite	3,269	1990
148 Usina Hidroelectrica de Samuel	21,210	1986
Subtotal	31 site	1,651,539 ha*
Extractivist Reserves		
149 Alto Jurua	506,186	1990
150 Antimari	260,277	1988
151 Cachoeira	24,099	1987
152 Cajari-2	82,000	
153 Cajari-3	104,000	
154 Chico Mendes	970,570	1990
155 Iratapuru	70,000	
156 Jaciparana & Mutumparana	240,000	
157 Macaue	103,106	1978
158 Maraca-1	75,000	1988
159 Maraca-2	22,500	1988
160 Maraca-3	226,500	1988
161 Matauau	68,000	
162 Ouro Preto	170,000	
163 Pacaas Novos	180,000	
164 Porto Dias	22,145	1987
165 Remanso	43,502	1987
166 Rio Cajari	481,650	1990
167 Rio Ouro Preto	204,583	1990
168 Rio Pedras Negras	180,000	
169 Riozinho	35,896	1988
170 Santa Quitéria	43,248	1980
171 Terrua	139,295	1989
Subtotal	23 sites	4,252,557 ha

Faunal Reserves			
172 Crubixas		710	
173 Secundario Perimetro de Sao Roque		23,900	1978
Subtotal	2 sites	24,610	ha
Federal Biological Reserves			
174 Augusto Ruschi (Nova Lombardia)		4,000	1982
175 Caracara		61,126	1971
176 Comboios		833	1984
177 Corrego Grande		1,504	1989
178 Corrego do Veado		2,392	1982
179 Marinha do Arvoredo		17,600	1990
180 Poco das Antas		5,000	1974
181 Saltinho		548	1982
182 Santa Isabel		2,766	1988
183 Serra Negra		1,100	1982
184 Sooretama		24,000	1982
185 Tingua		26,000	1989
186 Una		11,400	1980
Subtotal	13 sites	158,269	ha
Federal Ecological Reserve			
187 Alcobaca		200	1989
Subtotal	1 site	200	ha
Federal Ecological Stations			
188 Aiuaba		11,525	1981
189 Arariboia		44	
190 Babitonga		7,833	1987
191 Caracará		394,560	1982
192 Carijos		11,295	1987
193 Coco-Javaes		37,000	1981
194 Cunia		104,000	1982
195 Foz do Sao Francisco/Praia do Peba		5,322	1981
196 Guaraquecaba		13,638	1982
197 Ique		200,000	1981
198 Itabaiana		1,100	1987
199 Jureia		24,065	1986
200 Maraca		101,312	1981
201 Niquia		286,600	1985
202 Pirai		4,000	1982
203 Pirapitinga		1,090	1987
204 Raso da Catarina		200,000	1983
205 Taim		33,995	1986
206 Tamoios		4,070	1990
207 Tupinambas		4,628	1987
208 Tupiniquins		41	1986
209 Urucui-Una		135,000	1981
Subtotal	22 sites	1,581,118	ha
Federal Environment Protection Areas			
210 Cairucu		33,800	1983
211 Cananeia - Iguape e Peruibe		202,832	1984
212 Carstre do Lagoa Santa		35,600	1990
213 Fernando de Noronha-FEPA		1,692	1986
214 Guapi-Mirim		14,340	1984
215 Guaraquecaba		291,500	1985
216 Morro da Pedreira		66,200	1990
217 Petropolis		44,000	1982
218 Serra da Mantiqueira (M Gerais-S Paulo-R Jan)		402,517	1985
219 Serra da Tabatinga (Maranhao - Tocantins)		61,000	1990
Subtotal	10 sites	1,153,481	ha
Forest Parks			
220 Ibicatu		57	1982
221 Ilha dos Frades		380	1975
Subtotal	2 sites	437	ha

Forest Reserves		
222 Amapora	204	1962
223 Camorim	2,600	1941
224 Cavanca	300	1941
225 Figueira	100	1979
226 Garcia D'Avila	7,000	1975
227 Gorotire	1,843,000	1961
228 Grajau	50	1978
229 Gurupi		1961
230 Jaru	1,085,000	1961
231 Juruena	1,800,000	1961
232 Maracas	358	
233 Mendanha	1,400	1941
234 Mundurucania	1,377,000	1961
235 Nucleo Landulfo Alves		
236 Parima	1,756,000	1961
237 Pedra Branca		1941
238 Pedras negras	1,171,000	1961
239 Porto Seguro	6,070	
240 Rio Negro	3,790,000	1961
241 Tumucumaque	1,793,000	1961
242 Wenceslau Guimaraes	72,000	1973
Subtotal	21 site	14,705,082 ha*
Forest Stations		
243 Paraopeba	150	1950
245 Ritapolis	200	
Subtotal	3 sites	500 ha
Historical Sanctuary		
246 Piraja	1,550	1978
Subtotal	1 site	1,550 ha
Indigenous Areas		
247 Ajuricaba		
248 Aldeia Lameirao		
249 Alto Purus	265,000	1987
250 Alto Rio Guama	278,000	1990
251 Alto Tarauaca	23,840	1987
252 Alto Turiacu	530,524	
253 Alto do Jutai		
254 Anambe	7,912	1988
255 Ananas	1,769	
256 Andira Marau	465,868	
257 Aningal, Mpio Alto Alegre	7,627	
258 Anta	2,250	
259 Apinayes	141,904	
260 Apiterewa	981,722	1988
261 Araca	50,018	
262 Arara Cach. das Pimentas		
263 Arara Campo Grande		
264 Arara I	247,010	1990
265 Arara II	46,232	
266 Arara	1,060,400	
267 Arara do Igarape Humaita	27,700	1987
268 Arara do Riozinho da Liberdade		
269 Araraca		
270 Arariboia	413,288	
271 Arawete	985,000	1987
272 Aripuana (Mato Grosso & Rondonia)	753,400	
273 Awa	232,000	
274 Bacaja	192,126	1979
275 Bacurizinho	82,432	
276 Bakairi	61,405	
277 Barata Livramento	18,830	
278 Bau Menkranotire	1,850,000	1986
279 Boca do Acre		

280	Bom Jesus	1,313	
281	Boqueirao	13,950	
282	Cabeceira do Rio Acre	18,870	1988
283	Cachoeira Seca/Iriri	760,479	1989
284	Cajueiro	4,304	
285	Camicua		
286	Campinas	28,862	1985
287	Cana-Brava	131,868	
288	Canauamim	6,324	
289	Canela		
290	Capitao Marcos	480	
291	Capoto	186,000	
292	Cararao		
293	Caru	172,667	
294	Catete	439,151	1987
295	Catrimani		
296	Caxarari (part)		
297	Caxarari		
298	Coata Laranjal		
299	Coatinemo		
300	Cubate	1,023,000	
301	Cuminapanema	2,059,700	1987
302	Curua	13,000	1988
303	Cutaiba		
304	Deni	998,400	
305	Escondido	275,100	
306	Est. Rondon	2,400	
307	Estivadinho	1,970	
308	Estrela da Paz	16,300	
309	Evare 1	596,000	
310	Evare 2	165,000	
311	Felicidade	170	
312	Figueira	25,973	1987
313	Figueiras	10,000	
314	Funil	16,000	
315	Galibi	6,689	
316	Gaviao	7,980	
317	Geraldo e Toco-Preto	16,588	
318	Governador	41,644	
319	Guapenu	2,450	
320	Gurupira		
321	Iauarete	990,000	
322	Ibirama	14,156	
323	Icana-Ajari	896,000	
324	Icana-Xie	480,000	
325	Ig. Piranhas		
326	Igarape Grande	400	
327	Igarape Lages	107,321	
328	Igarape Lourdes	450	
329	Igarape Paroa		
330	Igarape Penedo e Bau		
331	Igarape Preto	79,500	
332	Igarape Ribeirao	47,863	
333	Ilha Jacare Xipaca	2,044	
334	Ipixuna	179,640	
335	Itaitinga	160	
336	Jaboti	8,000	
337	Jacamim	107,000	
338	Jaminawa Arara	28,280	1977
339	Jaminawa do Igarape Preto	23,117	1986
340	Japuirá	148,450	
341	Jaquiri	1,830	
342	Jarina/Margem Direita	139,000	
343	Jarudore	4,706	
344	Jatuarana	5,251	
345	Juami-Japura		
346	Jumina	24,000	

347 Jundia		
348 Kampa do Rio Amonea	91,200	1987
349 Kampa do Rio Envira	238,400	1987
350 Kanamari	607,563	
351 Kanela	125,212	
352 Karaja Santana do Araguaia	1,126,000	
353 Kararao	224,000	1988
354 Karipuna	195,000	
355 Karitiana	89,682	
356 Katukina e Kaxinawa de Feijo		
357 Katukina/Kaxinawa	17,750	1984
358 Kaxarari (also Rondonia)	127,540	
359 Kaxinawa da Colonia 27	105	1985
360 Kaxinawa da Praia do Carapana		
361 Kaxinawa do Igarape do Caucho	9,540	1986
362 Kaxinawa do Nova Olinda	32,150	1986
363 Kaxinawa do Rio Breu	23,840	1987
364 Kaxinawa do Rio Humaita	127,383	1984
365 Kaxinawa do Rio Jordao	92,000	1984
366 Kayabi	117,246	1982
367 Kayapo	3,204,000	1985
368 Koatinema	288,600	1988
369 Kokama	930	
370 Kraolandia	302,533	
371 Krikati	85,500	
372 Kulina do Igarape do Pau	14,400	1987
373 Kulina do Medio Jurua	770,300	
374 Kulina do Rio Envira	48,400	1986
375 Lago Aiapoa	25,500	
376 Lago Beruri	4,600	
377 Lagoa Comprida	13,198	
378 Lamerao	49,500	
379 Lauro Sodre	9,600	
380 Loba d'Almada e Aiamabo		
381 Lobo d'Almada		
382 Macarrao	25,312	
383 Mae Maria	62,488	1981
384 Malacacheta	16,150	
385 Mamoadate	313,646	1985
386 Mangueira	4,064	
387 Manoa/Pium	43,337	
388 Mapulau		
389 Marajai	845	
390 Mariene	10,793	
391 Matapi		
392 Maturaca		
393 Mekrangnoti	4,913,000	1990
394 Menku	47,094	
395 Mequens	105,250	
396 Meria	663	
397 Miratu	28,800	
398 Morro Branco	49	
399 Mucajai		
400 Mundurucu	1,965,000	1978
401 Muriru		
402 Murutinga	1,210	
403 Natal	250	
404 Nhamunda Mapuera (part)	845,400	
405 Nhamunda Mapuera	1,022,400	
406 Nove de Janeiro	234,400	
407 Nukini	30,900	1986
408 Ouro	13,573	
409 Pacaas Novas	473	
410 Pacu		
411 Padre	840	
412 Palimiu		
413 Paquicamba	4,351	1990

414	Paracana		
415	Paracuhuba	351,697	1985
416	Pari-Cachoeira	1,040	
417	Parima	1,152,000	
418	Paru d'Este		
419	Paumari	1,182,800	
420	Perigara		
421	Piraha	10,740	
422	Pirineus de Souza	389,000	
423	Pium	28,212	
424	Ponta de Serra	3,180	
425	Porquinhos	15,597	
426	Poyanawa	79,520	
427	Praia do Indio	19,987	1986
428	Praia do Mangue	20	1986
429	Raimundao	38	1986
430	Raposa/Serra do Sol	4,300	
431	Recanto da Saudade	1,401,320	
432	Recreo	13,750	
433	Rikbaktsa	690	
434	Rio Bia	79,935	
435	Rio Branco	1,180,200	
436	Rio Formoso	236,137	
437	Rio Gregorio	19,700	
438	Rio Guapore	92,859	1983
439	Rio Negro Ocaia	128,196	
440	Rio Paru do Leste	104,063	
441	Rio Pindare	1,182,800	
442	Rodeador	15,002	
443	Roosevelt (part with MT) Mpio Pimenta Bueno	2,319	
444	Roosevelt	233,055	
445	S. Felix	233,055	
446	S. Ines	350	
447	S. Leopoldo	29,698	
448	S. Pedro	55,000	
449	Sagarana	730	
450	Sai-Cinza	8,400	
451	Saluma	125,552	1988
452	Sangradoura/Volta Grande	533,940	
453	Sangradouro	11,660	
454	Santana	88,620	
455	Sao Domingos	35,471	
456	Sao Marcos	5,474	
457	Sarare	653,949	
458	Serra Morena	67,420	
459	Serra da Estrutura	148,300	
460	Serra da Moca		
461	Sete de Setembro (Rondonia & Mato Grosso)	11,626	
462	Sororo	247,870	
463	Sucuba	26,258	1977
464	Tabalascada	5,983	
465	Tabocal	7,000	
466	Tadarimana	730	
467	Tapirape/Karaja	9,785	
468	Taracua-Uaupes	66,166	
469	Tembe	1,666,000	
470	Tenharim	1,075	1989
471	Tenharim/Transamazonia		
472	Tereze Cristina	488,550	
473	Terra Vermelha	25,694	
474	Ticuna Betania	8,750	
475	Ticuna Feijoal		
476	Ticuna Margem Direita do Rio Solimoes	1,320	
477	Ticuna Margem Esquerda do Rio Solimoes		
478	Ticuna Porto Espiritual		
479	Ticuna Vuiyata-in	3,550	
480	Ticuna de Santo Antonio		
		1,450	

481 Tirecatinga		130,575	
482 Toototobi			
483 Tora		24,600	
484 Tracaja		1,550	
485 Trincheira		1,550	
486 Trincheira/Bacaja		1,438,856	1989
487 Trocara		21,722	1982
488 Truaru		6,640	
489 Tubarao Latunde		116,000	
490 Tuere		640,000	
491 Ture/Mariquita		146	1988
492 Uaca, 1 & 2		434,660	
493 Uai-Uai		330,000	
494 Uaimiri Atroari		2,585,911	
495 Uati-Parana		102,187	
496 Uauaris			
497 Umariacu		1,600	
498 Umutina		28,120	
499 Uneiuxi		405,000	
500 Uraricaa			
501 Uraricoera			
502 Uru-Eu-Uau-Uau		1,832,300	
503 Urucu-Jurua		12,697	
504 Utiariti		412,304	
505 Vale do Guapore		242,593	
506 Vale do Javari		8,338,000	
507 Vui-Uata-In		125,000	
508 Waiapi		543,000	
509 Waimiri-Atroari		2,440,000	
510 Xambioa		3,265	
511 Xinane			1987
512 Zoro		431,700	
513 Zuruaha		233,900	
Subtotal	267 sites	70,189,476 ha*	

Indigenous Colonies

514 Agricola S. Marcos			
515 Caninde			
516 Tembe-Guama			
Subtotal	3 sites		ha*

Indigenous Parks

517 Araguaia		1,395,000	
518 Aripuana		1,258,323	
519 Tumucumaque		2,700,000	1968
520 Xingu		2,642,008	
521 Yanomami (Amazonas and Roraima)		7,751,945	
Subtotal	5 sites	15,747,276 ha	

Indigenous Reserves

522 Amanayes		261,000	
523 Apiaca-Kayabi		111,410	
524 Areoes		218,515	
525 Caiabi			
526 Craos			
527 Ericbatsa			
528 Irantxe		46,790	
529 Jarina		268,813	
530 Marechal Rondon		98,500	
531 Merure		82,301	
532 Nambiquara		1,011,961	
533 Parabubure		224,447	
534 Pareci		563,586	
535 Pimental Barbosa		328,966	
536 Sao Marcos		188,478	
537 Xerente		167,542	
Subtotal	16 sites	3,572,309 ha*	

Municipal Natural Park		
538 Seringueiro		44 1991
Subtotal	1 site	44 ha
Municipal Parks		
539 Abaete		1,470 1977
540 Barreiras		50 1984
541 Dunas de Abrantes		700 1977
542 Ipitanga I		667 1986
543 Lagoa de Guarajuba		791 1977
544 Lagoa do Peri		2,030
545 Pituacu		660 1973
546 Sao Bartolomeu		75 1975
Subtotal	8 sites	6,443 ha
National Parks		
547 Amazonia (Para-Amazonas States)		994,000 1974
548 Aparados da Serra (R Grande Sul-Sta Catarina)		10,250 1959
549 Araguaia		562,312 1959
550 Brasilia		28,000 1961
551 Cabo Orange		619,000 1980
552 Caparao (Espirito Santo - Minas Gerais)		26,000 1961
553 Chapada Diamantina		152,000 1985
554 Chapada dos Guimaraes		33,000 1989
555 Chapada dos Veadeiros		60,000 1961
556 Emas (Goiás - Mato Grosso)		131,868 1961
557 Grande Sertao Veredas (Bahia and Minas Gerais)		84,000 1989
558 Iguacu		170,000 1939
559 Itatiaia (Rio de Janeiro-Minas Gerais)		30,000 1937
560 Jau		2,272,000 1980
561 Lagoa do Peixe		34,357 1986
562 Lençois Maranhenses		155,000 1981
563 Marinho Fernando de Noronha		11,270 1988
564 Marinho dos Abrolhos		91,300 1983
565 Monte Pascoal		22,500 1961
566 Monte Roraima		116,000 1989
567 Pacaas Novos		764,801 1979
568 Pantanal Matogrossense		135,000 1981
569 Pico da Neblina		2,200,000 1979
570 Sao Joaquim		49,300 1961
571 Serra da Bocaina (Sao Paulo - Rio de Janeiro)		100,000 1971
572 Serra da Canastra		71,525 1972
573 Serra da Capivara		97,933 1979
574 Serra do Cipo		33,800 1984
575 Serra do Divisor		605,000 1989
576 Serra dos Orgaos		11,000 1939
577 Sete Cidades		6,221 1961
578 Superagui		21,000 1989
579 Tijuca		3,200 1961
580 Ubajara		563 1959
581 Xingu		2,200,000 1961
Subtotal	35 sites	11,902,200 ha
Other areas		
582 Bento Gonçalves Silva SP		289 1972
583 Curiua Area of Ecological and Cultural Interest		5,700 1990
584 Intervalos		38,000
585 Lazer de Parati Mirim State Area		1,747 1976
586 Manuel Luiz Osorio		174 1971
587 Ouro Preto Municipal Park		222,082 1986
588 Penhaso verde		302 1991
589 Porto Velho Municipal Park		390 1989
Subtotal	8 sites	268,684 ha
Parks		
590 Boca da Mata		266 1991
591 Caracol		1973

592 FURNAS DO CATETE		7	
593 GUARA		192	1990
Subtotal	4 sites	465	ha*
Protected Area			
594 GRUTA DA IGREJINHA		688	1986
Subtotal	1 site	688	ha
Protected Watershed			
595 MATA DA ESTRELA		1,833	
Subtotal	1 site	1,833	ha
Protection Forest			
596 SERRA DOS PARECIS			1961
Subtotal	1 site		ha*
Special Biosphere Reserve			
597 MESTRE ALVARO		2,216	1976
Subtotal	1 site	2,216	ha
Specially Protected Areas			
598 BURITIZAIS			1986
599 CANYON		7,500	1986
600 PONTAL DO PEBA		4,500	1986
Subtotal	3 sites	12,000	ha*
State Biological Reserves			
601 ACAUA		5,195	1974
602 AGUAI		7,672	1983
603 ALTO DA SERRA DE PARANAPAICABA		336	
604 ARARAS		2,068	1972
605 BORAQUINHO		471	1955
606 CANELA PRETA		1,844	1980
607 CARMO DA MATA		86	1974
608 COLONIA 31 DE MARCO		5,033	1974
609 CORREGO DE SAO JORGE		255	
610 CORUMBA		580	1974
611 FAZENDA SAO MATEUS		377	1974
612 FAZENDA DA CASCATAS		64	1974
613 FAZENDA DA LAPINHA		368	1974
614 FONTE NOVA		377	
615 GUAPORE		600,000	1982
616 GUARATIBA		2,500	
617 IBIRAPUITA		351	1976
618 JACARANDA		2,700	1985
619 JARU		268,150	1979
620 MAR DE ESPANHA		188	1974
621 MATA ACAUA		5,000	1974
622 MATA DO JAMBREIRO		912	1977
623 MATA DOS AUSENTES		745	1975
624 MATO GRANDE		5,161	1975
625 NOVA BADEN		353	1974
626 PARAUNA		3,490	1979
627 PLANALTO		3	1980
628 PRAIA DO SUL		3,600	1981
629 RIO OURO PRETO		46,438	1990
630 SANTA RITA		604	1974
631 SAO DONATO		4,392	1975
632 SAO SEBASTIAO DO PARAISO		248	1974
633 SASSAFRAZ		5,416	1977
634 SCHARLAU		50	1975
635 SERRA GERAL		1,700	1982
636 SERTAOLINHO		720	1985
637 TRACADAL		22,540	1990
638 VILAFACCHINA		70	1969
Subtotal	38 sites	1,000,057	ha

State Ecological Reserves		
639 Culuene	3,000	1989
640 Iguape	90	
641 Ilheus		
642 Lagoa de Mabassu	450	
643 Morro Cururupe	5	
Subtotal	5 sites	3,545 ha*
State Ecological Stations		
644 Angatuba	1,394	1985
645 Bananal	884	1987
646 Baura	288	1987
647 Bracinho	4,606	1984
648 Caetetus	2,188	1987
649 Chauas	2,700	1987
650 Ibicatu	76	1987
651 Itabera	180	1987
652 Itapeti	89	1987
653 Itapewa	107	1985
654 Itirapina	2,300	1984
655 Jatai	4,532	1982
656 Mogi-Guacu	981	1984
657 Paraíso	4,920	1987
658 Paulo de Faria	436	1981
659 Ribeirão Preto	154	1984
660 Samuel	20,865	1990
661 Santa Barbara	2,712	1984
662 Santa Maria	111	1985
663 São Carlos	75	1987
664 Valinhos	17	1987
665 Xitue	3,095	1987
Subtotal	22 sites	52,710 ha
State Environment Protection Areas		
666 Atibaia		1986
667 Bacia dos Rios Piracicaba e Juqueri - Mirim	390,000	1987
668 Cabreúva	26,100	1984
669 Cajamar	13,400	1987
670 Campos do Jordão	26,900	1984
671 Corumbatai-Botucatu-Tejupá	641,000	1984
672 Ibitinga	64,900	1987
673 Ilha Comprida	19,375	1987
674 Jundiá	43,200	1984
675 Reconcavo	5,000	
676 Serra das Mangabeiras	96,743	1983
677 Serra do Mar	548,100	1984
678 Silveiras	42,700	1984
679 Tamoios		1986
680 Tietê	45,100	1983
681 Varzea do Alto Tietê	8,500	1987
Subtotal	16 sites	1,971,018 ha*
State Extractivist Forests		
682 Laranjeiras	30,687	1990
683 Rio Pacaás Novos	353,219	1990
684 Rio Preto/Jacunda	1,055,000	1989
Subtotal	3 sites	1,438,906 ha
State Forest Parks		
685 Espigão Alto	1,319	1949
686 Nonoai	17,498	1949
687 Rondinha	1,000	1982
688 Turvo		1947
Subtotal	4 sites	19,817 ha*
State Forest Reserves		
689 Morro Grande	10,626	

690 Sao Roque		23,900	
Subtotal	2 sites	34,526 ha	
State Parks			
691 Aguas Quentes		1,487	1978
692 Agudo da Cotia		1,009	1990
693 Alto Ribeira		37,712	1958
694 Anhumas		21	1983
695 Ara		63	1973
696 Bacanga		3,075	1980
697 Baleia		102	1988
698 Bauri		287	
699 Brigadeiro		32,500	1988
700 Cabugi		2,164	
701 Camaqua		7,992	1975
702 Campinhos		208	1979
703 Campos do Jordao		8,286	1941
704 Candeias		8,985	1990
705 Cantareira		7,000	
706 Canudos			
707 Capital		174	1958
708 Caracol		100	
709 Caraguatatuba		13,769	
710 Carlos Botelho		37,797	1982
711 Caxambu		1,040	1979
712 Corumbiara		586,031	1990
713 Delta do Jacui		4,322	1976
714 Desengano		22,500	1983
715 Diamante do Norte		1,427	
716 Dunas de Natal		1,172	
717 Espinilho		276	1975
718 Florencio Luciano			
719 Fonte Grande		218	1986
720 Fontes do Ipiranga		549	
721 Graciosa		1,189	1990
722 Guajara Mirim		258,813	1990
723 Guaramiranga		55	1979
724 Guarapiranga		18,000	
725 Ibiopora		74	1980
726 Ibitipoca		1,488	1973
727 Ibitiria		415	1975
728 Ilha Anchieta		828	1977
729 Ilha Bela		27,025	1958
730 Ilha Grande		15,000	1978
731 Ilha de Itaparica		2,180	1978
732 Ilha do Cardoso		22,500	1962
733 Itacolomi		7,542	1967
734 Itapua		1,535	1957
735 Jacupiranga		150,000	1969
736 Jaiba		6,358	1973
737 Jaragua		488	1939
738 Lauraceas		23,863	1989
739 Mananciais da Serra		2,249	
740 Marumbi		66,732	
741 Mata do Godoy		675	1990
742 Mirador		385,000	1980
743 Monce		362	
744 Monge		362	1979
745 Morro do Bau		600	1980
746 Morro do Chapau		6,000	1973
747 Morro do Diabo		34,441	1986
748 Nhamunda		28,370	1989
749 Palmas		180	
750 Pedra Branca		12,500	1974
751 Pico do Marumbi		1,957	1990
752 Podocarpus		3,645	1975
753 Ponia do Cabo Branco		379	1982

754 Porto Ferreira	612	1987
755 Rio Capivara	1,100	1975
756 Rio Cautario	121,167	1990
757 Rio Doce	35,973	1944
758 Rio da Onca	118	1981
759 Saint'Hilaire	1,180	1947
760 Sao Carlos	75	1961
761 Serra Caldas Novas	12,315	1970
762 Serra Furada	1,329	1980
763 Serra do Araca	1,818,700	1990
764 Serra do Mar	314,800	1969
765 Serra do Tabuleiro	87,405	1975
766 Serra dos Parecis	38,950	1990
767 Serra dos Reis	100,948	1990
768 Sumidouro	1,300	1980
769 Tainhas	4,924	1975
770 Terra Ronca	14,493	
771 Tiririca	2,400	
772 Torres	1,540	1953
773 Turvo	17,491	1965
774 Vascununga	1,484	1970
775 Vila Velha	3,245	1953
Subtotal	85 sites	4,442,620 ha*
State Reserves		
776 Aguas de Prata	48	1952
777 Amapora	204	1962
778 Banhado Grande	7,340	1981
779 Capao Bonito	6,534	1941
780 Carlos Botelho	7,189	
781 Cunha	2,854	1974
782 Duas Bocas	2,200	1965
783 Forno Grande	5,000	1960
784 Ilha dos Lobos	2	1983
785 Itatins	12,058	1958
786 Lagoa Sao Paulo	7,850	1942
787 Mestre Alvaro	2,461	
788 Pedra Azul	1,119	1960
789 Pinheiros	19	1981
790 Sete Barras	15,646	1941
791 Travessao	8,273	1957
792 Vila Rica do Espirito Santo	353	1955
Subtotal	17 sites	79,150 ha
Wildlife Sanctuaries		
793 Barra do Rio Mirim		
794 Nova Vicosa		
795 Turiacu		
Subtotal	3 sites	ha*
Proposed (Ecological Stations)		
Arariboia	44	
Cunia	104,000	
Mamipaua	217,500	
Subtotal	3 sites	321,544 ha
Proposed (Other areas)		
Arquipelago do Bailique/Foz do Gurijuba		
Cachoeira Grande		
Cerrado/Tracajatuba		
Foz do Macacoari		
Lagoa dos Indios		
Subtotal	5 sites	ha*
Proposed (State Park)		
Cataguases	69	
Subtotal	1 site	69 ha

Totals		
Existing conservation areas	795 sites	141,642,537 ha*
Proposed conservation areas	9 sites	321,613 ha*

* Subtotal is incomplete because of missing data.

COLOMBIA

Fauna and Flora Sanctuaries

1 Cienaga Grande de Santa Marta	23,000	1977
2 Galeras	17,600	1985
3 Iguaque	6,750	1977
4 Isla de la Corota	8	1977
5 Los Colorados	1,000	1977
6 Los Flamencos	7,000	1977
Subtotal	55,358	ha

6 sites

Indigenous Reserves

7 Afilador	9,325	
8 Alto Rio Guainia	477,200	
9 Alto y Medio Rio Inirida	2,762,500	
10 Bajo Rio Guainia y Rio Negro	759,200	
11 Barrancon	2,500	
12 Caiman Nuevo	7,500	
13 Carraipia	5,115	
14 Corocito Yopalito Gualabo	8,257	
15 Cuiari-Isana	926,500	
16 El Unuma	1,273,600	
17 Guayacan - Santa Rosa	236	
18 La Fuga	8,360	
19 La Sal	3,275	
20 Luzon	2,500	
21 Macucuana	5,700	
22 Medio Rio Guainia - Serrania Naquen	853,320	
23 Motilon Bari	83,000	
24 Paujii	52,120	
25 Rio Atabapo	513,720	
26 Rio Verde	9,200	
27 Rios Muco y Guarrojo	84,000	
28 San Jose de Lipa	18,500	
29 San Rafael, Abariba, Ibibi	61,525	
30 Santa Rosa de Sucumbios	5,129	
31 Santa Rosa del Guamuez	3,750	
32 Tauretes Agua Blanca	8,000	
33 Venezuela	803	
34 Yarina	9,813	
Subtotal	7,954,648	ha

28 sites

Natural National Parks

35 Amacayacu	293,000	1975
36 Cahuinari	575,500	1987
37 Catatumbo-Bari	158,125	1989
38 Chingaza	50,374	1977
39 Chiribiquete	1,280,000	1989
40 Corales del Rosario	19,506	1977
41 Cordillera de los Picachos	439,000	1989
42 Cueva de los Guarcharos	9,000	1960
43 El Cocuy	306,000	1977
44 El Tuparro	548,000	1970
45 Farallones de Cali	150,000	1968
46 Isla Gorgona	49,200	1984
47 Isla de Salamanca	21,000	1969
48 La Paya	422,000	1984
49 Las Hermosas	125,000	1977
50 Las Orquideas	32,000	1974
51 Los Katios	72,000	1973
52 Los Nevados	58,300	1959
53 Macuira	25,000	1977
54 Munchique	44,400	1977
55 Nevado del Huila	158,000	1977
56 Paramillo	460,000	1977
57 Pisba	45,000	1977
58 Purace	83,000	1968

59 Sanquianga		80,000	1977
60 Sierra Nevada de Santa Marta		383,000	1964
61 Sierra de la Macarena		630,000	1989
62 Sumapaz		154,000	1977
63 Tama		48,000	1977
64 Tatama		54,300	1987
65 Tayrona		15,000	1964
66 Tinigua		201,785	1989
67 Utria		54,300	1987
Subtotal	33 sites	7,043,790	ha
Natural National Reserves			
68 Nukak		855,000	1989
69 Puinawuai		1,092,000	1989
Subtotal	2 sites	1,947,000	ha
Natural Reserve			
70 Laguna de Sonso		2,045	1979
Subtotal	1 site	2,045	ha
Natural Unique Area			
71 Los Estoraques		640	1988
Subtotal	1 site	640	ha
Resguardos			
72 Aduche		370,100	
73 Agua Clara y Bella Luz del Rio Ampora		9,850	
74 Agua Negra		2,000	
75 Aguanegra		1,474	
76 Aldana		480	
77 Almidon-La Ceiba		40,960	
78 Alta y Media Guajira		959,104	
79 Alto Rio Bojaya		50,160	
80 Alto Rio Buey		13,151	
81 Alto Rio Cuta		22,362	
82 Alto Rio Tagachi		21,260	
83 Alto del Rey		1,244	
84 Amenanae o Charco del Nino Dios		6,990	
85 Aponte		894	
86 Arara		12,300	
87 Arhuaco de la Sierra Nevada		195,900	
88 Arquia		2,343	
89 Arrecifal		4,560	
90 Atana Pirariami		48,800	
91 Avirama		2,518	
92 Bachaco Buena Vista		73,280	
93 Bajo Rio Vichada o Santa Rita		424,320	
94 Barranco Ceiba y Laguna Araguato		24,940	
95 Barranquito Laguna Colorado		19,132	
96 Belaicazar		6,000	
97 Bellavista y Union Pitalito o Rio Siguirisua		29,260	
98 Bete, Auro Bete y Auro del Buey		11,580	
99 Bochoroma-Bochoromacito		526	
100 Buenavista		4,500	
101 Burujon o La Union San Bernardo		6,960	
102 Cabeceras o Puerto Pizario		2,920	
103 Caimanero de Jampapa		1,742	
104 Calenturas		3,066	
105 Calle Santa Rosa		21,320	
106 Campoalegre y Ripialito		7,815	
107 Canamoho		1,036	
108 Cano Bachaco		6,074	
109 Cano Bocon Brazo Amanaven		10,085	
110 Cano Cavasi		36,000	
111 Cano Guaripa		7,705	
112 Cano Jabon		9,040	
113 Cano La Hormiga		4,327	

114	Cano Mochuelo - Hato Corozal	94,600
115	Cano Negro	1,833
116	Cano Ovejas o Betania-Corocito	1,720
117	Cano Zama	73,380
118	Canos Cuna Tsepajibo Warracana	56,000
119	Caranacoa-Yuri-Laguna Morocoto	45,840
120	Carlosama	717
121	Carpintero Palomas	40,680
122	Carrizal	9,870
123	Cenareros	123
124	Chachajo	2,240
125	Chagpien-Tordo	22,460
126	Chami Margen Izquierda Juan	7,030
127	Chami Rio Garrapatas	15,730
128	Chami Rio San Juan Margen Derecha	17,770
129	Chaparral-Barronegro	14,230
130	Chiles	440
131	Chimborazo	2,112
132	Chimurro y Nedo	13,185
133	Chinas	
134	Chololobo-Matatu	6,385
135	Christiania	430
136	Chuscal y Tuguriducito	5,122
137	Coayare-El Coco	11,840
138	Cobarria	45,400
139	Coconuco	3,424
140	Colimbs	1,600
141	Comeyafu	19,180
142	Consejo	4,500
143	Coquiona	6,239
144	Cordoba	4,000
145	Corocoro	33,500
146	Coropoya	3,923
147	Cota	1,859
148	Cuaiquer o Awua del Alto Albi	4,760
149	Cuambi-Yaslambi	3,000
150	Cuayuyaco	1,260
151	Cumaral Brazo Amanaven	23,355
152	Cumbal	8,000
153	Cusay o la Colorada	1,200
154	Cusumbe-Aguablanca	330
155	Cuti	244
156	Docordo-Balsalito	4,140
157	Egua Guariacana	15,390
158	El Doce o Quebrada Borbollon	1,185
159	El Duya, San Juanito y Paravare	21,300
160	El Hacha	6,637
161	El Quince	1,200
162	El Saladillo	1,595
163	El Suspiro o Rincon del Socorro	1,978
164	El Tablero	4,336
165	El Unuma	418,840
166	El Veinte, Playalta y El Noventa	3,334
167	El Venado	34,160
168	El Vigia	487
169	El Zaino, Guayabito, Muriaytuy	1,175
170	Gabarra Catalaura	13,300
171	Gano Claro	1,633
172	Giro Brazo Amanaven	20,310
173	Gorgonta	438
174	Guacamayas-Mamiyare	18,700
175	Guachavez	1,052
176	Guachicono	13,932
177	Guachucal	3,000
178	Guaco Bajo y Guaco Alto	49,660
179	Guaguando	13,260
180	Guambia	18,529

181	Guangui	24,100
182	Guayabal de Partado	4,376
183	Honduras	21,121
184	Huila	41,402
185	Iguana	10,900
186	Infi	4,200
187	Inga de Nineras	3,394
188	Ipiales	5,156
189	Iroka	8,600
190	Jagual-Rio Chintado	28,175
191	Jambaio	23,476
192	Jirijiri	4,960
193	Julieros y Velasqueros	228
194	Jurado	16,700
195	Kananeruba	9,150
196	Kilometro 6 y 11 - Carretera Leticia-Tarapaca	7,500
197	La Esmeralda	2,762
198	La Esperanza	117
199	La Llanura	74,000
200	La Montana	20,300
201	La Pascua	19,120
202	La Samaritana	4,185
203	Laguna Anguilla-La Macarena	16,130
204	Laguna Curvina-Sapuara	3,350
205	Laguna Negra y Cacao	18,480
206	Lame	
207	Los Iguanitos	700
208	Macarieros	16
209	Macuare	24,000
210	Mallama	1,281
211	Mataven Fruta	84,453
212	Mayasquer	3,000
213	Merey La Veraita	3,107
214	Ministas Miralindo	40,200
215	Miriti-Parana	1,162,500
216	Mocagua, Macedonia, El Vergel y Zaragoza	16,750
217	Mondo-Mondocito	1,232
218	Monochoa	376,800
219	Morocoto Buenavista	49,940
220	Mosoco	12,025
221	Motordo	570
222	Muellanues	2,000
223	Murcielago-Altamira	7,960
224	Napipi	21,910
225	Nazareth	1,300
226	Nunuya de Villazul	142,620
227	Opogado	29,020
228	Panam	4,000
229	Pancitara	9,636
230	Paniquita	249
231	Papayo	2,460
232	Parreros	207
233	Parte Oriental del Vaupes	3,354,097
234	Pioya	1,600
235	Pirayo	5,000
236	Pobiazon	609
237	Polines	2,538
238	Potosi	1,800
239	Predio Putumayo	5,230,552
240	Provincial	448
241	Puado, Matate, La Lerma Y Terdo	12,662
242	Pueblo Nuevo Laguna Colorado	44,845
243	Pueblo Nuevo	5,000
244	Puerto Alegre y la Divisa	22,365
245	Puerto Cordoba	39,700
246	Puerto Libre-Rio Pepe	2,069
247	Puerto Naranjo, Penas Rojas, Cuerazo y El D.	3,000

248	Puerto Sabalo y los Monos	303,700
249	Purace	6,203
250	Puyeros	27
251	Quebrada Canaveral Rio San Jorge	2,815
252	Quichaya	1,500
253	Quizgo	10,000
254	Remanzo-Chorro Bocon	73,680
255	Rio Bebarama	8,875
256	Rio Blanco	5,000
257	Rio Curiche	8,965
258	Rio Dagua	43
259	Rio Domingodo	24,590
260	Rio Ichu y Quebrada Baratudo	5,342
261	Rio Jarapeto	5,583
262	Rio Mumbu	3,000
263	Rio Murindo	18,270
264	Rio Naya	774
265	Rio Negua	5,463
266	Rio Nuqui	9,500
267	Rio Orpua	22,290
268	Rio Pangui	7,870
269	Rio Pichima	9,024
270	Rio Quiparado	9,860
271	Rio Siare o Barranco Lindo	47,320
272	Rio Taparai	14,212
273	Rios Catru y Dubasa	48,980
274	Rios Jurubida, Chori y Alto Baudo	80,350
275	Rios Lanas o Capa	6,400
276	Rios Pato y Jengado	3,162
277	Rios Tomo Weberi	60,540
278	Rios Uva y Pogue	47,500
279	Rios Valley Boroboro	21,020
280	Roqueros	101
281	S. Andres de Sotavento	6,219
282	Salaqui-Pavarando	107,000
283	San Andres de Pisimbaia	3,365
284	San Antonio de Los Lagos y San Sebastian	200
285	San Antonio del Fragua	1,400
286	San Francisco I	15,064
287	San Francisco II	57
288	San Jose	11,037
289	San Juan	331
290	San Luis del Tomo	25,100
291	San Matias o Jai-Dukama	1,371
292	San Sebastian	1,300
293	Santa Maria de Pangala	9,500
294	Santa Rosa	1,587
295	Santa Rosalia	5,700
296	Santa Sofia y el Progreso	4,200
297	Santa Teresita del Tuparro	180,000
298	Saracure y Rio Cada	174,000
299	Sejalito-San Benito	4,823
300	Sibundoy Parte Alta	3,252
301	Sokorpa	25,000
302	Sta Cecilia Quebrada Rio Choco	5,723
303	Suin	10,533
304	Tacueyo	27,885
305	Tahami del Andagueda	50,000
306	Tanela	900
307	Tarena	4,888
308	Tigres y Monchique	8,254
309	Tinajas	253
310	Tiosilidio	4,560
311	Toez	7,687
312	Togoima	
313	Togoroma	8,640
314	Toribio	9,018

315 Totoro I		4,161	
316 Totoro II		1,906	
317 Trapiche-Rio Pepe		1,008	
318 Trupioганcho y la Meseta		2,309	
319 Tumbichucue		4,300	
320 Tunebo de Angostura		3,282	
321 Tuquerres		502	
322 Union Choco-San Cristobal		21,400	
323 Vaarual		502	
324 Valdivia		3,985	
325 Valle del Sibundol		3,252	
326 Vitonco		7,245	
327 Wayuu de Lomamoto		1,572	
328 Witora		67,200	
329 Yaigoje-Rio Apaporis		518,320	
330 Yanguillo		4,230	
331 Yaramal		500	
332 Yuquiva		16,380	
333 Yuri Brazo Amanaven		15,836	
Subtotal	262 sites	17,121,959	ha*
Special Management Areas			
334 Ariari-Guayabero		1,022,339	1989
335 La Macarena Norte		467,010	1989
336 La Macarena Sur		33,200	1989
Subtotal	3 sites	1,522,549	ha
Proposed (Fauna and Flora Sanctuaries)			
Cachalu		15,000	
Virolin			
Subtotal	2 sites	15,000	ha*
Proposed (Natural National Parks)			
Amacayacu Extension		300,000	
Bahia Malaga			
Curiche			
Jirijirina		1,000,000	
Old Providence		530	
Piusbi		500,000	
San Miguel		250,000	
Tatarcuna		80,000	
Taira			
Waunana		20,000	
Subtotal	10 sites	2,150,530	ha*
Totals			
Existing conservation areas	336 sites	35,647,989	ha*
Proposed conservation areas	12 sites	2,165,530	ha*

* Subtotal is incomplete because of missing data.

ECUADOR

Biological Reserve			
1 Limoncocha		4,613	1985
Subtotal	1 site	4,613 ha	
Ecological Reserves			
2 Cayambe-Coca		403,103	1970
3 Cotachi-Cayapas		204,420	1968
4 Manglares-Churute		35,042	1979
Subtotal	3 sites	642,565 ha	
Faunal Production Reserves			
5 Chimborazo		58,000	1987
6 Cuyabeno		254,760	1979
Subtotal	2 sites	312,760 ha	
Forest Reserve			
7 Awa		101,000	1988
Subtotal	1 site	101,000 ha	
Geobotanical Reserve			
8 Pululahua		3,383	1978
Subtotal	1 site	3,383 ha	
Marine Resource Reserve			
9 Galapagos		7,990,000	1986
Subtotal	1 site	7,990,000 ha	
National Parks			
10 Cotopaxi		33,393	1975
11 Galapagos		766,514	1959
12 Machalilla		55,000	1979
13 Podocarpus		146,280	1982
14 Sangay		271,925	1975
15 Yasuni		679,730	1979
Subtotal	6 sites	1,952,842 ha	
National Recreation Areas			
16 Cajas		28,808	1979
17 El Boliche		1,077	1979
Subtotal	2 sites	29,885 ha	
Protected Forests			
18 Aguacatal de Arriba		130	1987
19 Aguallaca		1,724	1988
20 Bosque Petrificado de Puyango		2,658	1987
21 Bosque Puyango		2,658	1987
22 Santa Gallo Jipijapa		8,170	1989
23 Caracha		260	1987
24 Carrisal Chone		75,700	1988
25 Cashca Totoras		6,537	1988
26 Cerro Casigana		108	1984
27 Cerro Paraiso		420	1989
28 Cerros Guinzales		3,338	1985
29 Chilanes Bucay		1,857	1989
30 Chilcapamba y Dromopamba		72	
31 Cinturon Verde Loja		9,373	1988
32 Cinturon Verde de Quito		21,929	1988
33 Comuna Loma Alta		1,858	1989
34 Cooperativa Conguito		50	1971
35 Coordillera Chongon		2,000	1989
36 Coordillera de Cutucu		311,500	1990
37 Coordillera de Molleturo		28,100	1968
38 Cuenca Alta del Guayllabamba		13,800	1989
39 Cuenca Daule Peripa		220,835	1987
40 Cuenca Rio Coca y Panza		6,630	1979

41 Cuenca Rio Cube	4,925	1990
42 Cuenca Rio Paute	195,161	1985
43 Cuenca Rios Atacames	10,620	1990
44 Cuenca del Rio Portoviejo	17,500	1972
45 Cuencas Quebradas Moro Moro		1969
46 Cuencas de San Ramon y San F.		1970
47 El Guabo	2,213	1988
48 Hollin Loreto Coca	110,046	1987
49 Ingenio Santa Rosa	2,410	1987
50 Jeco	2,324	1987
51 Jima Limitada	2,104	1991
52 La Floresta	3,122	1988
53 La Merced	407	1989
54 La Paz y San Jose Quijos	399	1985
55 La Perla	250	1986
56 Loma del Corazon y Bretana	7,081	1990
57 Manglares	362,802	1987
58 Maquipucuna	2,700	1989
59 Matiaivi Salinas	1,857	1988
60 Migir	265	1987
61 Mindo Nambillo	19,200	1988
62 Mindo y Nambillo	19,200	1988
63 Napo, Area Boscosa	235,000	1978
64 Pacay	300	1989
65 Papaloma Charum	34	1982
66 Parque Jerusalem	1,110	1989
67 Pasochoa	3,196	1982
68 Peribuela	343	1989
69 Pichincha	8,096	1983
70 Piganta	928	1984
71 Pilopata	320	1982
72 Presa Tahuin	14,911	1989
73 Ramal Estero Salado	17	1987
74 Rio San Francisco		1978
75 San Alfonso	55	1975
76 San Camilo	902	1982
77 San Carlos de Yanahurco	645	1986
78 San Eloy		1974
79 San Francisco de Huaque	60	1976
80 San Joaquin	934	1975
81 San Pablo	110	1978
82 Santa Marta Shical	40	1982
83 Santa Rita	2,145	1988
84 Santa Rosa y Yasquel	2,597	1987
85 Shishimbe-Chillanes	1,064	1987
86 Subcuenca Rio Blanco	5,410	1990
87 Subcuenca Rio Dudahuayco	2,000	1982
88 Suiza-Pucara	1,000	1980
89 Sumaco	100,045	1987
90 Sun Sun Yanasacha	3,850	1982
91 Taminga-Quichinche		1979
92 Toachi Pilaton	212,000	1987
93 Toaza	1,247	1989
94 Tonchige		
95 Totorillas	657	1982
96 Volcan Pichincha	8,096	1985
97 Zarapullo	21,585	1986
Subtotal	80 sites	2,112,990 ha*
Totals		
Existing conservation areas	97 sites	13,150,038 ha*
Proposed conservation areas	0 sites	ha

* Subtotal is incomplete because of missing data.

FRENCH GUYANA

Nature Reserve			
1 Mirande			1942
Subtotal	1 site		ha*
Protected Biotope			
2 Reserve de Kaw		79,200	1989
Subtotal	1 site	79,200	ha
State Biological Reserves			
3 Camopi pic crevaux		105,000	
4 Montagne des Singes		22,000	
5 Monts Atachi Bacca		188,000	
6 Monts Lucifers et Dekou Dekou		108,000	
7 Riviere des Cascades		6,000	
Subtotal	5 sites	429,000	ha
Proposed (Biogenetic Reserve)			
Montagne Tortue			
Subtotal	1 site		ha*
Proposed (Nature Reserves)			
Awala		7,750	
Centre Nature de Sinnamary		20,100	
Crique Sparouine Voltaire		11,110	
Foret de Paletuviers		11,400	
Haut Iracoubo		98,300	
Mana		22,100	
Montagne des Singes		3,150	
Montagnes de la Trinite		73,050	
Nouragues		104,000	
Ouanary Montagne d'Argent		169,500	
Paracou		6,350	
Parc du Sud		2,348,200	
Pte Isere		4,250	
Riviere des Cascades		8,750	
Zone Paul Isnard		111,120	
Zone de Saul		106,800	
Subtotal	16 sites	3,105,930	ha
Totals			
Existing conservation areas	7 sites	508,200	ha*
Proposed conservation areas	17 sites	3,105,930	ha*

* Subtotal is incomplete because of missing data.

GUYANA

National Park			
1 Kaieteur		58,559	1929
Subtotal	1 site	58,559 ha	
Proposed (National Park)			
Kaieteur extension		340,000	
Subtotal	1 site	340,000 ha	
Totals			
Existing conservation areas	1 site	58,559 ha	
Proposed conservation areas	1 site	340,000 ha	

PARAGUAY

Biological Refuges

1 Mbaracayu		1,356	1983
2 Tatiyupi		2,245	1983
Subtotal	2 sites	3,601	ha

Biological Reserves

3 Itabo		11,260	1983
4 Limo'y		14,332	1983
Subtotal	2 sites	25,592	ha

National Parks

5 Caaguazu		16,000	1976
6 Cerro Cora		12,038	1976
7 Defensores del Chaco		780,000	1975
8 Salto del Guaira		900	1973
9 Teniente Encisco		40,000	1980
10 Tinfunque		280,000	1966
11 Ybycui		5,000	1973
12 Ybytyruzu		24,000	1990
13 Ypacarai		16,000	1990
Subtotal	9 sites	1,173,938	ha

National Reserves

14 Cerro Lambare		3	1948
15 Kuri'y		100	1973
Subtotal	2 sites	103	ha

Protection Forests

16 Nacunday		1,000	1975
17 Yaku'y		1,000	1973
Subtotal	2 sites	2,000	ha

Scientific Monument

18 Bertoni		200	1955
Subtotal	1 site	200	ha

Proposed (National Parks)

Nueva Asuncion			
Yacyreta			
Subtotal	2 sites		ha*

Proposed (Protected Areas)

Bosque Araru	10,000
Bosque Estrella	30,000
Bosque Piray	22,500
Bosque Ype Jhu	75,000
Cabecera del Arroyo Pitanoahaga	25,000
Cerro Acahay	6,000
Cerro Guazu	15,000
Cerro Sarambi	15,000
Cordillera Caaquazu	80,000
Cuenca de Arroyo San Rafael	30,000
Cuenca del Acaray-mi	250,000
Cuenca del Lago Ypoa	95,000
Estella de Concepcion	2,400
Estero Neembucu	80,000
Estero Puerto Milagros	45,000
Estero Puerto Rosario	445,000
Itapucumi	45,000
Laguna Blanca	5,500
Laguna Negra	10
Mbaracayu	60,000
Salto Monday	
Salto Tembey	
Serrania San Joaquin	60,000

Serrania San Rafael		90,000
Subtotal	24 sites	1,486,410 ha*
Totals		
Existing conservation areas	18 sites	1,205,434 ha
Proposed conservation areas	26 sites	1,486,410 ha*

* Subtotal is incomplete because of missing data.

PERU

Communal Reserve			
1 Yanesha		34,744	1988
Subtotal	1 site	34,744	ha
Historical Sanctuaries			
2 Chacamarca		2,500	1974
3 Machu Picchu		32,592	1981
4 Pampa de Ayacucho		300	1980
Subtotal	3 sites	35,392	ha
Hunting Reserves			
5 El Angolo		65,000	1975
6 Sunchubamba		59,735	1977
Subtotal	2 sites	124,735	ha
National Parks			
7 Cerros de Amotape		91,300	1975
8 Cutervo		2,500	1961
9 Huascaran		340,000	1975
10 Manu		1,532,806	1973
11 Rio Abiseo		274,520	1983
12 Tingo Maria		18,000	1965
13 Yanachaga Chemillen		122,000	1986
Subtotal	7 sites	2,381,126	ha
National Reserves			
14 Calipuy		64,000	1981
15 Junin		53,000	1974
16 Lachay		5,070	1977
17 Pacaya Samiria		2,080,000	1982
18 Pampa Galeras		6,500	1967
19 Paracas		335,000	1975
20 Salinas y Aguada Blanca		366,936	1979
21 Titicaca		36,180	1978
Subtotal	8 sites	2,946,686	ha
National Sanctuaries			
22 Ampay		3,635	1987
23 Calipuy		4,500	1981
24 Huayllay		6,815	1974
25 Lagunas de Mejia		691	1984
26 Manglares de Tumbes		2,972	1988
27 Pampas del Heath		102,109	1983
28 Tabaconas-Namballe		29,500	1988
Subtotal	7 sites	150,222	ha
Protection Forests			
29 Aledano a la bocatoma del Canal Nuevo Imperial		18	1980
30 Alto Mayo		182,000	1987
31 Pagaibamba		2,078	1987
32 Pui-Pui		60,000	1985
33 Puquio Santa Rosa		73	1982
34 San Matias-San Carlos		145,818	1987
Subtotal	6 sites	389,987	ha
Reserve Zones			
35 Apurimac (Ex-N.F. Apurimac)		1,669,200	1988
36 Laquipampa		11,347	1982
37 Manu		257,000	1980
38 Racali		6,433	1985
39 Tambopata		5,500	1977
40 Tambopata-Candamo		1,478,942	1990
41 Udimá		8,469	1991
Subtotal	7 sites	3,436,891	ha

Proposed (National Parks)		
Cerro Illescas and Islas Lobos		300,000
Cutivireni		300,000
Loreto		2,000,000
Subtotal	3 sites	2,600,000 ha
Proposed (National Reserves)		
Atequipa		40,000
Cordillera del Condor		85,000
Subtotal	2 sites	125,000 ha
Proposed (National Sanctuaries)		
Este del Maranon		98,125
Huaros		500
Paramo		60,000
Santuario de Virrila		10,000
Sira NatS and CoR		500,000
Valle de los Volcanes		60,000
Subtotal	6 sites	728,625 ha
Totals		
Existing conservation areas	41 site	9,499,783 ha
Proposed conservation areas	11 site	3,453,625 ha

SURINAME

Multiple Use Management Area

1 Bigi Pan		68,320	1987
Subtotal	1 site	68,320 ha	

Nature Park

2 Brownsberg		8,400	1969
Subtotal	1 site	8,400 ha	

Nature Reserves

3 Boven Coesewijne		27,000	1986
4 Brinckheuvel		6,000	1972
5 Copi		28,000	1986
6 Coppename Monding		12,000	1966
7 Eilerts de Haan		220,000	1966
8 Galibi		4,000	1969
9 Hertenrits		100	1972
10 Peruvia		31,000	1986
11 Raleighvallen-Voltzberg		78,170	1966
12 Sipaliwini		100,000	1972
13 Tafelberg		140,000	1966
14 Wane kreek		45,400	1986
15 Wia-wia		36,000	1961
Subtotal	13 sites	727,670 ha	

Proposed (Multiple Use Management Areas)

Bijzonder Beheersgebied Estuariene		310,000	
Estuarine Zone		310,000	
Subtotal	2 sites	620,000 ha	

Proposed (Nature Reserves)

Kaboerikreek		68,000	
Nani		54,000	
Subtotal	2 sites	122,000 ha	

Totals

Existing conservation areas	15 sites	804,390 ha	
Proposed conservation areas	4 sites	742,000 ha	

VENEZUELA

Biosphere Reserves (National)

1 Alto Orinoco-Casiquiare	8,400,000	1991
2 Delta del Orinoco	876,500	1991
Subtotal	2 sites	9,276,500 ha

Critical Priority Areas

3 Acuífero de Calabozo	415,000	1978
4 Mesa de Guanipa	900,000	1978
5 Paramo de Veriguaca	2,597	1981
6 Pico Jengibre (C. Lago de Valencia)	303,500	1979
7 Río Albarregas	11,948	1979
Subtotal	5 sites	1,633,045 ha

Faunal Refuges

8 Cano Guaritico	9,300	1989
9 Cuare	11,825	1972
10 De la Tortuga Arrau	17,431	1989
11 Estero de Chiriguare	32,169	1974
12 Isla Aves	54	1972
13 Laguna de Boca de Cano	453	1989
14 Los Olivitos	25,723	1986
Subtotal	7 sites	96,955 ha

Faunal Reserves

15 Ciénagas de Juan Manuel, Aguas Blancas y Negras	71,500	1975
16 Sabanas de Anaco	16,331	1982
Subtotal	2 sites	87,831 ha

Littoral Parks

17 Lagunas de Los Patos	20	1978
18 Punta Delgada	25	1978
Subtotal	2 sites	45 ha

National Parks

19 Aguaro-Guariquito	585,750	1974
20 Archipielago Los Roques	221,120	1972
21 Canaima	3,000,000	1962
22 Cerro El Copey	7,130	1974
23 Cerro Saroche	32,294	1989
24 Chorro el Indio	10,800	1989
25 Ciénagas del Catatumbo	250,000	1991
26 Cinaruco-Capanaparo	584,368	1988
27 Cueva de la Quebrada El Toro	4,885	1969
28 Dinira	42,000	1988
29 Duida Marahuaca	210,000	1978
30 El Ávila	81,800	1958
31 El Guacharo	62,700	1975
32 El Tama	139,000	1978
33 Guaramacal	21,000	1988
34 Guatopo	122,464	1958
35 Henri Pittier	107,000	1937
36 Jaua Sarisarinama	330,000	1978
37 Laguna de Tacarigua	39,100	1974
38 Laguna de la Restinga	18,862	1974
39 Macarao	15,000	1973
40 Mariusa	331,000	1991
41 Medanos de Coro	91,280	1974
42 Mochima	94,935	1973
43 Morrocoy	32,090	1974
44 Paramos del Batallon y La Negra	95,200	1989
45 Parima-Tapirapeco	3,420,000	1991
46 Peninsula de Paria	37,500	1978
47 Perija	295,288	1978
48 San Esteban	43,500	1987
49 Serranía de la Neblina	1,360,000	1978

50	Sierra Nevada	276,446	1952
51	Sierra de San Luis	20,000	1987
52	Sierra de la Culata	200,400	1989
53	Terepaima	18,650	1976
54	Turuepano	70,000	1991
55	Yacambu	14,580	1962
56	Yacapana	320,000	1978
57	Yurubi	23,670	1960
	Subtotal	39 sites	12,629,812 ha
Natural Monuments			
58	Cerro Autana	30	1978
59	Cerro Platillon	8,000	1987
60	Cerro Santa Ana	1,900	1972
61	Cerros Matasiete y Guayamuri	1,672	1974
62	Chorreras Las Gonzalez	126	1980
63	Cueva Alfredo Jahn	58	1978
64	Cueva del Guacharo (Alejandro Humboldt)	181	1949
65	Formaciones de Tepuyes	1,069,820	1990
66	Laguna de Urao	29	1979
67	Laguna de las Marites	3,674	1974
68	Las Tetras de Maria Guevara	1,670	1974
69	Loma de Leon	7,275	1989
70	Maria Lionza	11,712	1960
71	Morros de Macaira	99	1978
72	Morros de San Juan (Aristides Rojas)	2,755	1949
73	Pico Codazzi	11,850	1991
74	Piedra de Cocuy	15	1978
	Subtotal	17 sites	1,120,866 ha
Protective Zones			
75	Area Metropolitana de Caracas	84,300	1972
76	Barquisimeto	46,273	1987
77	Cabos, Puntas y Lagunas de Isla de Margarita	1,549	1988
78	Cerro El Volcan	554	1980
79	Cuenca Alta de los Rios Maticora y Cocuiza	241,500	1974
80	Cuenca Alta del Rio Cojedes	276,000	1974
81	Cuenca Alta del Rio Tocuyo	141,600	1974
82	Cuenca Alta y Media del Rio Machango	113,000	1990
83	Cuenca Altas y medias del Rio Pao	68,000	1974
84	Cuenca del Rio Guarico	40,207	1974
85	De la Ciudad de Coro	19,720	1987
86	Distrito Guaicaipuro	560	1980
87	El Cigarron	45,230	1989
88	Escalante Onia Mucujepe	101,125	1975
89	Espacio Territorial Proximo Costa y Paralelo Mar		1989
90	La Machiri	2,000	1973
91	La Mariposa	2,810	1988
92	La Pereza	330	1976
93	La Tortuga Arrau	9,856	1989
94	Laguna de la Danta	2,203	1974
95	Las Gonzales	11,220	1980
96	Litoral Central	35,723	1974
97	Macizo Montanoso del Turimiquire	540,000	1974
98	Maracaibo	20,800	1986
99	Margen Izquierda del Rio Masparro	5,000	1974
100	Mitare Nakichenovich	615	1970
101	Mucujun	19,450	1985
102	Piedemonte Norte de la Cordillera Andina	431,727	1974
103	Region Lago de Maracaibo	244,125	1974
104	Rio Albarregas	11,233	1973
105	Rio Capaz	45,700	1989
106	Rio Chuspita	5,642	1976
107	Rio Torbes y sus Alrededores	12,000	1974
108	Rio Yacambu	46,900	1974
109	Rios Guanare, Bocono, Tucupido, La Yuca y Masparro	400,000	1991
110	Rubio	23,760	1978

111 San Antonio - Urena		6,223	1982
112 San Cristobal		10,000	1978
113 San Rafael de Guasare		302,000	1973
114 Serrania San Luis		86,000	1987
115 Sierra Nirgua		146,590	1974
116 Sierra de Aroa		113,000	1991
117 Sierra de Bobare		140,000	1974
118 Sur del Edo Bolivar		7,262,358	1974
119 Sureste del Lago de Maracaibo Sto. Domingo		406,662	1974
120 Sureste del Lago de Maracaibo Uribante-Caparo		446,000	1974
121 Valle de Algodonal		214	1976
Subtotal	47 sites	11,969,759	ha*

Proposed (National Parks)

Archipelago las Aves
Cerron-Empalado
Guariquen
Islas Tortuga
La Blanquilla-Los Hermanos
Lago de Valencia
Los Testigos-Los Frailes
Macanao
Orinoquia
Paramo la Cimarroera

Subtotal 10 sites ha*

Proposed (Natural Monuments)

Galeras de Guarumen
Palmar del Estero de Camaguan

Subtotal 2 sites ha*

Totals

Existing conservation areas	121 sites	36,814,813	ha*
Proposed conservation areas	12 sites		ha*

* Subtotal is incomplete because of missing data.

Annex 13.2 Extent of notified forests by forest origin and forest function. Non-forest includes both degraded forest and lands not forested at the time of their reservation.

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Bolivia

Total area (sq.km): 1098580

Land area (sq.km): 1084390

Month/year of reference: 1988, 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	6412200				8558195	
Non-forest						
Plantation						
TOTAL	6412200	0	0	0	8558195	0

Notes:

Sources: Goitia, 1988; Pinaya, in litt, 1991; CDC-Bolivia, 1990

All forests, estimated at 56.468 million ha, are nationalised.

The figure for production forests (above) is the total area covered by bosques permanentes de producción (permanent production reserves). Legislation also exists which gives all 'bosques de aliso' (alder forests) in the country production status. No area is given for these forests, so they are not included in this table.

The total area under concession (to commercial foresters) is 22,511,326ha (Goitia, 1988).

This area probably incorporates many of the permanent production reserves, while the remainder of these concessions presumably lie within unclassified forest.

Conservation forests consist of bosque permanente de protección (permanent protection forest) and reserva forestal de inmovilización (closed forest reserves).

The status of the remaining state-owned forest in the country, not covered by legal designations or under forestry concessions (approximately 20,000,000ha) is unclear.

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Brazil

Total area (sq.km): 8511970

Land area (sq.km): 8456510

Month/year of reference: 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	14300724				22444120	
Non-forest						
Plantation						
TOTAL	14300724	0	0	0	22444120	0

Notes:

Sources: Protected Areas Database, WCMC, 1991

The figure for production forests is based on the total for national forests, state forest and sustainable production state forest.

The figure for natural conservation forest is the total biological reserves, municipal parks, state parks, national and state forest parks and forest reserves, forest stations, protection forests, and state extractivist forests. The first three of these designations are covered under the 1965 Forestry Code.

Little information is available concerning the administration of these sites, or of the activities permitted within them, and it may be that some serve production or protection purposes, or are actually administered by the wildlife sector.

The 1965 Forestry Code also provides for certain categories of area to be protected, such as natural vegetation along the side of watercourses, on certain hills and mountains, on steep slopes and in dunes and marshy areas. There are no area for the data covered by these provisions.

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Colombia

Total area (sq.km): 1138910

Land area (sq.km): 1038700

Month/year of reference: 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	44080860		350000			
Non-forest						
Plantation	266000					
TOTAL	44346860	0	350000	0	0	0

Notes:
Sources: FAO, 1991; INDERNA-DPN, in litt., 1991

Natural production forests represent the total area covered by the seven forest reserves declared under 1959 legislation. It would appear that some or all of the indigenous territories and conservation areas fall within this category, and hence that they are not solely established for production purposes. FAO (1991) gives the total area of open and closed production forest as 44,080,860ha. The total area of state and private plantations is given as 266,000ha. The legal status of these forests is unclear, hence they have not been incorporated into the table.

Natural protection forest consists of the area covered by the 45 protected forest reserves. FAO (1991) gives the total area of non-commercial (for physical reasons) closed forest as 9,431,850ha, while further large areas of protected, closed commercial forest cover some 4,220,815ha. The legal status of these forests is, again, unclear.

Estimates of total area of forest cover range from 38.7 to 53.1 million hectares (IUCN/ITTO, 1991).

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Ecuador

Total area (sq.km): 283560

Land area (sq.km): 276840

Month/year of reference: 1989, 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	8070000		2184036			
Non-forest	2600000					
Plantation	66100					
TOTAL	10736100	0	2184036	0	0	0

Notes:

Sources: MAG, n.d.; Luis Suarez, in litt., 1992; IUCN/ITTO, 1991.

No figures are available giving the areas covered by the legally notified production forests (bosques de producción) and forest reserves (reservas forestales).

The figures for production forest given above are taken from MAG (n.d.), the legal status of these forests is unknown. This same source source gives the total area of natural forest as 11,473,000ha, a figure which presumably includes protection forests and conservation forests.

The area of natural protection forest represents the area of protected forests (bosque protectores) and one forest reserve (reserva forestal) (Luis Suarez, in litt., 1992). IUCN/ITTO states that at least 300,000ha of this is not forested.

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: French Guiana

Total area (sq.km): 90000

Land area (sq.km): 88150

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	1500000					
Non-forest						
Plantation						
TOTAL	1500000	0	0	0	0	0

Notes:

Source: D.Girou (1991) Direction de l'Agriculture et de la Forêt

The figure for natural production forests consists of 1,500,000ha along the northern coastal strip set aside for production, approximately 200,000ha of this had been exploited by 1990.

A southern limit has been set for forest exploitation. The area of forest to the south of this consists of some 6.5 million ha "dédié à la conservation".

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Guyana

Total area (sq.km): 214970

Land area (sq.km): 196850

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	9100000					300000
Non-forest						
Plantation						
TOTAL	9100000	0	0	0	0	300000

Notes:
Source: Guyana Forestry Commission, in litt., 1991; Guyana Natural Resources Agency, in litt., 1991.

The figure for natural production forests is the area for legally defined state forest. Of this area, 5,251,264ha has been allocated as timber concessions. The remainder is available for concession with the exeption of some 300,000ha of virgin forest which has been set aside for the Commonwealth-Government of Guyana lwokrama Rain Forest Project. This latter area is awaiting legislation and hence is listed as proposed conservation forest. No area is available for protection forest, however management plans usually exclude steep areas (over 18 degrees) and river bank areas (30m each side of rivers) from production. There is some disagreement between these figures, provided by the Forestry Commission and those of the Natural Resources Agency (1991). The latter gives the total area of state forest as 8,799,652ha, including four 'forest conservations' and the Kaiteur National Park. These these 'forest conservations' cover some 145,590ha, the fourth site, the Abrary Catchment forest conservation is not given an area.

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Paraguay

Total area (sq.km): 406750

Land area (sq.km): 397300

Month/year of reference: 1990

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	700				2000	
Non-forest						
Plantation						
TOTAL	700	0	0	0	2000	0

Notes:

Sources: Ministerio de Agricultura y Ganaderia, Sub-Secretaria de Estado de Recursos Naturales y Medio Ambiente, in litt., 1990

Natural production forest comprises a single site known as forest for commercial purposes (bosques con fines comerciales).

Natural conservation forests comprise two protected forests (bosques protegidos), all of which have undergone some previous timber exploitation.

The Environmental Protection Law of 1986 declares that a 100m wide belt of protected forest is to be left on both sides of rivers, streams, water sources and lakes – this distance may be increased according to the importance of the water source.

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Peru

Total area (sq.km): 1285220

Land area (sq.km): 1280000

Month/year of reference: 1991

FOREST ORIGIN	F O R E S T		F U N C T I O N		Conservation forests	
	Production forests		Protection forests		Existing forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	3226858.5		389987		3596371.1	
Non-forest						
Plantation						
TOTAL	3226858.5	0	389987	0	3596371.1	0

Notes:

Source: Centro de Datos para la conservacion, in litt., 1991

The figure for natural production forest is the area of national forests (bosques nacionales).

The figure for natural protection forest is the total area of the six protection forests (bosques de protección)

The figure for natural conservation forests is the total area covered by hunting reserves (cotos de caza)(2 sites), communal reserves (reservas comunales)(1) and reserved zones (zonas reservadas)(7).

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Suriname

Total area (sq.km): 163270

Land area (sq.km): 156000

Month/year of reference: 1991

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural		10000				
Non-forest						
Plantation						
TOTAL	0	10000	0	0	0	0

Notes:
Source: Ministry of Natural Resources and Energy, in litt., 1991

The area given as natural production forests (proposed) consists of two sites proposed in 1988 – it is unclear whether these sites should be classified as production, protection or conservation forest.

The National Report on Forests 1990, states that 2,414,800ha of State owned forest have been granted concessions or cutting permits. A further 12,000ha of plantations have been established in the country.

The same report gives the total area of forest in the country as 14.8 million ha; 11,065,600ha are described as inaccessible and lie in the interior of the country, while the remainder is accessible (this in turn is divided into exploitable forest (2,239,400ha) and non-exploitable (1,550,000ha)).

Annex 13.2 (continued)

Region: Tropical Latin America

Sub-region: Tropical South America

Name of country/state: Venezuela

Total area (sq.km): 912050

Land area (sq.km): 882050

Month/year of reference: 1989

FOREST ORIGIN	F O R E S T F U N C T I O N					
	Production forests		Protection forests		Conservation forests	
	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)	Existing (ha)	Proposed (ha)
Natural	14106266		13602804			
Non-forest						
Plantation						
TOTAL	14106266	0	13602804	0	0	0

Notes:

Sources: MARN, 1992; Carrero, in litt., 1992

The figure for existing natural production forests is the total area covered by forest plots, forest reserves and hydrological reserves. The latter category includes many areas of open water where there is no forest.

The figure for natural protection forests is the total area covered by the 47 protected zones and the five critical priority areas, a number of these areas may contain little or no forest.

Carrero (1992) provides a series of figures that differ considerably from those given here:

production forests – 3646323ha existing and 21,458,781ha proposed

protection forests – 18,906,500ha existing and 3,010ha proposed

conservation forests: 7,305,104ha existing

This variation is the result of differing interpretation of the above categories. For example, Carrero has classified hydrological reserves as conservation forest, where the legal definition, which allows for regulated exploitation, probably means it is better suited to the production forest category.

