

Protected Areas Programme

Protected Areas of the World

A review of national systems

Afrotropical

Volume 3



Compiled by The World Conservation Monitoring Centre



IVth World Congress on National Parks and Protected Areas,
Caracas, Venezuela




The World Conservation Union

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IUCN – THE WORLD CONSERVATION UNION

Founded in 1948, IUCN – The World Conservation Union – is a membership organisation comprising governments, non-governmental organisations (NGOs), research institutions, and conservation agencies in over 100 countries. The Union's mission is to provide leadership and promote a common approach for the world conservation movement in order to safeguard the integrity and diversity of the natural world, and to ensure that human use of natural resources is appropriate, sustainable and equitable.

Several thousand scientists and experts from all continents form part of a network supporting the work of its Commissions: threatened species, protected areas, ecology, environmental strategy and planning, environmental law, and education and communication. Its thematic programmes include forest conservation, wetlands, marine ecosystems, plants, the Sahel, Antarctica, population and natural resources, and Eastern Europe. The Union's work is also supported by 12 regional and country offices located principally in developing countries.

WCMC – THE WORLD CONSERVATION MONITORING CENTRE

The World Conservation Monitoring Centre (WCMC) is a joint venture between the three partners who developed the World Conservation Strategy: IUCN – The World Conservation Union, UNEP – United Nations Environment Programme, and WWF – World Wide Fund For Nature (formerly World Wildlife Fund). Its mission is to support conservation and sustainable development through the provision of information on the world's biological diversity.

WCMC has developed a global overview database that includes threatened plant and animal species, habitats of conservation concern, critical sites, protected areas of the world, and the utilisation and trade in wildlife species and products. Drawing on this database, WCMC provides an information service to the conservation and development communities, governments and United Nations agencies, scientific institutions, the business and commercial sector, and the media. WCMC produces a wide variety of specialist outputs and reports based on analyses of its data.

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Compiled by the World Conservation Monitoring Centre

in collaboration with

The IUCN Commission on National Parks and Protected Areas

for the

**IVth World Congress on National Parks and Protected Areas,
Caracas, Venezuela, 10-21 February 1992**

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IUCN – The World Conservation Union

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FOREWORD

The inspirational and aesthetic values of fine examples of the beauty and bounty of nature lay behind the establishment of many national parks and other types of protected areas. More recently there has been increasing recognition of the range of the value of protected areas and of their contribution to meet the needs of society by conserving the world's natural and physical resources. These values range from protection of representative samples of natural regions and the preservation of biological diversity, to the maintenance of environmental stability in surrounding country. Protected areas can also facilitate complementary rural development and rational use of marginal lands, and provide opportunities for research and monitoring, conservation education, and recreation and tourism.

Over the past thirty years, since the *First World Conference on National Parks* was held in Seattle, Washington (1962), our view of the world, and our impact on the world, has changed significantly. Throughout this time, and despite the mounting pressures of expanding human populations, the number of protected areas established has continued to rise. Since the centennial of national parks was commemorated at the time of the *Second World Conference on National Parks* at Yellowstone and Grand Teton, Wyoming in 1972, the "human" element of protected areas has come more and more into focus. They are no longer seen as being "locked up" or "set apart". Rather, they are seen as being integral to strategic approaches to resource management, a concept enshrined in the *World Conservation Strategy* (1980) based on managing natural areas to support development in a sustainable way.

The fundamental contribution of protected areas to sustainable management was reaffirmed by participants at the *World Congress on National Parks* held in Bali, Indonesia (1982), and for the last decade the *Bali Action Plan* has focused attention on a range of actions necessary for promoting and supporting protected areas. These actions were further focused in regional action plans subsequently developed by members of the IUCN Commission on National Parks and Protected Areas, covering the Afrotropical, Indomalayan, Neotropical and Oceanian regions.

More recently, two significant, and widely accepted documents have stressed the very vital roles that protected areas play. The report of the *World Commission on Environment and Development* was published in 1987, and more recently a new strategy *Caring for the World* was launched in 1991. This latter strategy, which has its roots in the *World Conservation Strategy*, clearly identifies the functions and benefits of protected area systems, what they safeguard, and why they are important for development opportunities.

Many countries have declared extensive systems of protected areas, and are continuing to develop and expand them. The systems and the sites they contain vary considerably from one country to another, depending on national needs and priorities, and on differences in legislative, institutional and financial support. Consequently, protected areas have been established under many different national designations to provide for a spectrum of management objectives, ranging from total protection to sustainable use: from strict nature reserves to lived-in landscapes.

IUCN – The World Conservation Union has been involved in protected areas issues for many years, and has published a significant body of information on the subject. The IUCN Commission on National Parks and Protected Areas was set up both to ensure that the appropriate expertise was available to advise the Union, and to bring together professionals to share information and experience. IUCN and CNPPA have together had a very strong hand in developing the programme for the *IV World Congress on National Parks and Protected Areas* in Caracas, Venezuela (1992).

For more than 10 years, IUCN and CNPPA have worked closely with what is now the World Conservation Monitoring Centre, to help in building an information resource on protected areas. The information is of value to the Commission in developing its own programmes, in identifying priorities, and for a wide range of other purposes such as supporting international initiatives in World Heritage, wetlands and biosphere reserves. It is also important to both IUCN and the Commission that such information is made available to others, so that the roles and values of protected areas are more widely recognised, appreciated and respected.

The three volume *Protected Areas of the World: A review of national systems* is being published for the World Parks Congress by WCMC and IUCN in cooperation with British Petroleum, and aims to provide a standard format "overview" of the world's protected area systems. While this product has gaps, and no doubt inaccuracies, it does illustrate very clearly the range of protected areas activities around the world, and gives an indication of the protected areas estate under the stewardship of our managers. This product, in combination with the protected areas reviews being prepared for the Congress by the CNPPA Regional Vice-Chairs, will also provide a benchmark against which to measure our achievements over the next decade.

P.H.C. (Bing) Lucas
Chair

IUCN Commission on National Parks and Protected Areas

INTRODUCTION

Participants at the *Third World National Parks Congress* held in Bali, Indonesia, in 1982, clearly recognised that the availability of comprehensive, good-quality information on the world's protected areas was essential to a wide range of international organisations, governments, protected area managers, voluntary bodies and individuals. Such information is a prerequisite for assessing the coverage and status of protected areas from regional and global perspectives, and is key to the development of regional and global priorities and strategies. Monitoring protected areas is vital to ensure that those areas allocated to conserve the world's natural resources meet the needs of society.

The World Conservation Monitoring Centre (WCMC) is expanding its capabilities as an international centre for information on the conservation of biological diversity. Working closely with the IUCN Commission on National Parks and Protected Areas (CNPPA), WCMC continues to compile an extensive database on the world's protected areas, which is being used more and more frequently as a source of information.

One result of WCMC's work as an information centre is the ability to draw material together into publications which provide background information on protected areas and protected area systems. At the previous congress in 1982, two publications from the protected areas database were available, the *1982 UN List*, and the *IUCN Directory of Neotropical Protected Areas*. Since then, the Centre has collaborated with CNPPA and others on a wide range of publications, including two subsequent *UN Lists* in 1985 and 1990, directories of protected areas for Africa, Oceania, South Asia, and the mountains of central Asia, and various publications on eastern Europe. A full list of publications on protected areas (including those published by others with information provided by WCMC) is available from the Centre.

The present work, *Protected Areas of the world: A review of national systems*, is the first attempt by WCMC to compile a world-wide survey of protected area systems. The book is organised into national (or occasionally sub-national) accounts, each comprising a description of the national protected areas system, accompanied by a summary list and map of protected areas. The book is divided into three volumes, with volume one covering the Indomalayan, Oceanian, Australian and Antarctic realms, volume two the Palaearctic and Afrotropical realms, and volume three the Nearctic and Neotropical realms.

Publication of such a book serves two purposes. First, it provides extensive background information on the protected area systems of the world, relevant to several plenary sessions and workshops at the *IV World Congress on National Parks and Protected Areas*. In particular, it is a contribution to the third plenary session *The Contributions of Protected Areas to Sustaining Society: A Global Review*. Secondly, and perhaps more significantly, it is also part of the process of information collection and verification. Feedback from protected areas professionals, and others familiar with protected areas, is therefore both welcomed and encouraged, because only by a continual process of review and update can we present a true picture.

Jeremy Harrison
World Conservation Monitoring Centre

ACKNOWLEDGEMENTS

Preparation of a directory of this magnitude is only achieved through a tremendous amount of effort and cooperation. Over the years, protected areas professionals throughout the world have reviewed or compiled material for us, or provided new information. Quite simply, without their cooperation this book could not have been completed, and we greatly appreciate their support.

This assistance has been facilitated in part by the IUCN Commission on National Parks and Protected Areas, and the support of the Commission and its past and present officers is gratefully acknowledged. In particular we would like to thank the present chair P.H.C. (Bing) Lucas of New Zealand, and his predecessor Harold Eidsvik of Canada. Work has also been supported by the staff of the IUCN Protected Areas Unit, and in particular James Thorsell and Jeffrey McNeely.

This particular publication is the product of two projects. The *British Petroleum Company plc* has provided support for the preparation of part of the text and maps (for those areas not covered by the second mentioned project), and have provided funds for publishing the book and distributing it at the World Parks Congress in Caracas, Venezuela. At the same time, the *British Overseas Development Administration* has supported review of information on tropical and sub-tropical countries, as part of a project contributing to the FAO Forest Resources Assessment 1990. Thanks are due to both organisations for their support.

A number of past and present staff of WCMC have been involved in preparing this directory, which includes material published in several earlier directories. Compilation of country accounts has been the responsibility of: Patricia Almada-Villela, Daphne Clark, Graham Drucker, Harriet Gillett, Michael Green, Donald Gordon, Jeremy Harrison, Zbigniew Karpowicz, Sara Oldfield, James Paine and Mark Spalding. Assistance with the preparation of maps has been provided by Mike Adam, Clare Billington, Simon Blyth and Gillian Bunting.

Notwithstanding the significant contributions of the many individuals who have provided information to WCMC and CNPPA, errors and omissions must remain the responsibility of the compilers.

This directory is not intended to be a final statement but a review of the world's protected area systems. If WCMC is to continue to carry out its mission, there is a continual need to maintain and update this information as national protected areas systems change and as more information becomes available. Therefore, with this directory goes a plea for corrections, comments and additional material to help WCMC carry out its mission as effectively as possible. By the same token, the information that WCMC collects and manages is available to others to support their work and programmes.

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MANAGING INFORMATION ON PROTECTED AREAS AT WCMC

Many individuals and organisations need basic information on protected areas systems, lists of protected areas with certain features, or analyses of protected areas statistics, yet it is unlikely that they will have the time or resources to collect, compile and analyse all of the information for themselves. Such information also needs to be kept up-to-date, as properties are added or extended, and as legislation or administrative regimes change. Users may also require details about the major protected areas within national systems, such as physical features, vegetation and fauna, or on other aspects such as management status and constraints.

It is to meet these needs that the WCMC Protected Areas Data Unit (PADU) was founded. This service enables users to obtain quickly information on protected areas from a single source, be it for purposes of analysis and assessment, or as briefing material. It is not intended that this service should by-pass any need for users to contact or visit the relevant national authorities for such information, but use of PADU's resources enables users to be well informed prior to making such approaches and in a better position to ask the right questions when so doing.

Institutional background

IUCN – The World Conservation Union has been closely involved in protected areas issues for many years. As early as 1960, it established a Commission on National Parks and Protected Areas (CNPPA) to serve as the "leading international, scientific and technical body concerned with the selection, establishment and management of national parks and other protected areas". CNPPA has always emphasised the need for information on which to base effective conservation planning and management, and has been very active in collecting and disseminating information on protected areas.

As the world's network of protected areas has expanded and its management improved, information on national protected areas systems and individual protected areas has proliferated. This led CNPPA to set up PADU in 1981 to manage this increasing volume of information. Establishment of this Unit was supported by the United Nations Environment Programme (UNEP), as part of its Global Environment Monitoring System (GEMS). Originally part of the IUCN Conservation Monitoring Centre, PADU is now a unit within the World Conservation Monitoring Centre (WCMC), restructured in July 1988 and jointly managed by IUCN, the World Wide Fund for Nature (WWF) and UNEP.

Objectives

WCMC aims to provide accurate up-to-date information on protected area systems of the world for use by its

partners (IUCN, WWF and UNEP) in the support and development of their programmes, and by other international bodies, governmental and non-governmental organisations, scientists and the general public. Such information covers the entire spectrum of protected areas, from national parks and sanctuaries established under protected areas legislation or customary regimes to forest reserves created under forestry legislation. It also includes privately-owned reserves in which nature is protected.

Specific objectives are to:

- maintain a comprehensive and up-to-date database of the world's protected areas;
- compile definitive, standard-format accounts summarising national protected areas systems;
- hold maps of protected areas systems and digitise them;
- compile definitive, standard-format accounts covering individual protected areas, particularly the major properties in tropical countries and those of international importance;
- accumulate current and historical information on protected areas; and
- provide support to regional and international activities, programmes and conventions relating to protected areas.

Information capture, management and compilation

Information is collected from official sources, namely national agencies responsible for administering protected areas, and other sources through a global network of contacts ranging in profession from policy-makers and administrators to land managers and scientists. It is also obtained from published and unpublished literature. Regional CNPPA meetings and other relevant scientific and technical meetings provide valuable opportunities for making new contacts and collecting fresh information. This material in itself is a major asset of the Centre.

Information, ranging from books, reports, management plans, scientific papers, maps and correspondence, is stored as hard copy in manual files. Basic data on individual protected areas are extracted and, after verification, entered in a protected areas database, which currently holds some 26,000 records. This computerised database can be used for generating lists of protected areas meeting pre-defined criteria, together with summary statistics, as well as performing more complex tasks. In addition, maps of protected areas are gradually being digitised, using a Geographic Information System, in order to generate computerised graphic output.

The information is also used to produce accounts of protected areas systems and individual protected areas. These accounts are compiled according to standard formats developed over the years by WCMC in collaboration with CNPPA.

Dissemination of information

In keeping with its primary objective, WCMC aims to make available good quality information on protected areas to a wide range of users, including international organisations, governments, protected area managers, conservation organisations, commercial companies involved in natural resource exploitation, scientists, and the media and general public. Information may be provided or consulted by arrangement.

Material may be prepared under contract: for example, WCMC regularly provides UNEP with summary data on protected areas for its biennial *Environmental Data Report*. WCMC is experimenting with providing outside users with direct access to its protected areas database. Trials have been ongoing with the US National Park Service since 1986 and it is hoped to be able to extend this service to other users shortly.

Compiled information is periodically published in the form of regional or thematic directories and lists. Directories comprise sections on individual countries, each with a protected areas *system information sheet*, a *list of protected areas and accompanying location map*, and a series of *site information sheets* covering at least the more important properties. Prior to releasing or publishing documents, draft material is circulated for review by relevant government agencies and experts to help ensure that compiled information is accurate and comprehensive.

Major lists and directories published to date are as follows:

- *United Nations List of National Parks and Protected Areas* (1982, 1985, 1990)
- *IUCN Directory of Neotropical Protected Areas* (1982)
- *IUCN Directory of Afrotropical Protected Areas* (1987)
- *IUCN Directory of South Asian Protected Areas* (1990)
- *Protected Areas in Eastern and Central Europe and the USSR* (1990)
- *IUCN Directory of Protected Areas in Oceania* (1991)
- *Nature Reserves of the Himalaya and the Mountains of Central Asia* (1992)
- *Information System: Biosphere Reserves: Compilation 4* (1986)
- *Biosphere Reserves: Compilation 5* (1990)

- *Directory of Wetlands of International Importance* (1987, 1990)
- *Protected Landscapes: Experience around the World* (1987)

In addition, numerous draft directories, reports papers and reviews have been produced. A list of these is available from WCMC.

WCMC also disseminates information through the *CNPPA Newsletter* and *Parks* magazine. In the case of the latter, WCMC has assumed responsibility for compiling *Clipboard* in which world news on protected areas is featured.

Special services

WCMC has a very close working relationship with CNPPA. While the Commission provides expert advice and support through its network of members, WCMC supports many of the Commission's activities through provision of technical information. WCMC has a particular responsibility for managing information on natural properties designated under international conventions and programmes, namely the *Convention concerning the Protection of the World Cultural and Natural Heritage* (World Heritage Convention), *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (Ramsar Convention), and the *Unesco Man and the Biosphere Programme*. Thus, WCMC cooperates closely with the Division of Ecological Sciences, Unesco, in maintaining information on biosphere reserves and World Heritage sites accorded by the MAB Secretariat and World Heritage Committee, respectively. Likewise, it works closely with the Ramsar Bureau with respect to managing information on Ramsar wetlands.

The rest of the World Conservation Monitoring Centre

Protected areas is only one aspect of the programme of the World Conservation Monitoring Centre, which also covers information on plant and animal species of conservation concern, important natural habitats and sites of high biological diversity, wildlife utilisation, and the international trade in wildlife.

To monitor the impact of man on nature is a major task. This requires close collaboration between agencies, and between agencies and individuals, and the development and exchange of information. WCMC acts both as an information centre, and as a facilitator of information management and exchange. WCMC has now embarked on an ambitious programme to promote improvements in the availability of information, and to develop its database capabilities and information services. Information on the distribution and status of the world's protected areas is an essential component of this programme.

COUNTRY ACCOUNTS: GUIDELINES TO THEIR CONTENTS

In general, there is an account for each country, divided up into a series of sections with standard headings. The following notes summarise the type of information included in each section where it is available. In certain cases, accounts have been prepared for areas which are parts of countries, usually where the area concerned is geographically separate from the "parent" country.

Country

Full name of country or political unit, as used by the United Nations (United Nations *Terminology Bulletin* on Names of Countries and Adjectives of Nationality).

Area

Total area according to the latest volume of the *FAO Production Yearbook* prepared by the Statistics Division of the Economic and Social Policy Department, FAO, unless otherwise stated (with full reference). Terrestrial and marine components are distinguished, if appropriate.

Population

Total population and its mean annual rate of growth according to the latest issue of *World Population Prospects*, published by the United Nations Population Division. Year of census or estimate is indicated in parentheses. If another source has to be used, it is cited.

Economic Indicators

Gross domestic product and gross national product per capita in US dollars (or net material product in the case of centrally planned economies), with year in parentheses. These figures are according to the latest issue of *National Accounts Statistics: Analysis of Main Aggregates* (prepared by the United Nations Statistical Office) and *The World Bank Atlas*.

Policy and Legislation

Information on aspects of the constitution that are relevant to nature conservation and protected areas.

Summary of national policies that relate to nature conservation, particularly with respect to the protection of ecosystems. This may include reference to policies relating to environmental impact assessments, and national/regional conservation strategies.

Brief chronological account of past and present national legislation and traditions that relate to the establishment of the protected areas system, with names (in English), dates and numbers of acts, decrees and ordinances. Legislation covering forestry and other resource sectors is included, in so far as it provides for protected areas establishment. Procedures for the notification and declassification of protected areas are summarised.

Outline of legal provisions for administering protected areas

National designations of protected areas are cited and their range of provisions outlined. Their legal definitions, together with the names of the authorities legally responsible for their administration, are summarised in an Annex (see below).

Reviews of protected areas policy and legislation are noted, with any identified deficiencies in prevailing provisions highlighted.

International Activities

Participation in international conventions and programmes (World Heritage and Ramsar conventions, MAB Programme, UNEP Regional Seas Programme) and regional conventions and agreements (such as the African, ASEAN and Berne conventions, the FAO Latin American/Caribbean Technical Cooperation Network, South Asian Cooperative Environmental Programme and the South Pacific Regional Environment Programme) relevant to habitat protection is summarised.

Outline of any international, multilateral and bilateral cooperative programmes or transfrontier cooperative agreements relevant to protected areas.

Administration and Management

All authorities responsible for the administration and management of protected areas are named and described, with a brief history of their establishment, administrative organisation, staff structure, budget and any training programmes. Authorities responsible for different types of protected areas are clearly distinguished.

Outline of the role of any advisory boards.

Cooperative agreements between management authorities and national or foreign universities and institutes, with details of any research underway or completed.

Names and brief details of non-governmental organisations concerned with protected areas. Reference to any national directories of voluntary conservation bodies is included.

Effectiveness of protected areas management is noted where information has been provided. Attention is drawn to any sites registered as threatened under the World Heritage Convention, or by the IUCN Commission on National Parks and Protected Areas.

Systems Reviews

Short account of physical features, biological resources, and land use patterns (with percentages if available), including the extent and integrity of major ecosystems.

Brief review of the development of nature conservation programmes, so far as it relates to the establishment and expansion of the national protected areas network. Emphasis is given to any systems reviews or comprehensive surveys of biological resources, with details of major recommendations arising from such studies.

Threats to the protected areas system beyond the control of the management agencies are outlined.

Other Relevant Information

Tourism and other economic benefits of the protected areas system, if applicable.

Other items, as appropriate.

Addresses

Names and addresses (with telephone, telex and fax numbers, and cable) of authorities responsible for administering protected areas. Names are given in the original language or transliterated, with English translation in brackets as appropriate, and followed by the title of the post of the chief executive.

Names and addresses (with telephone, telex and fax numbers, and cable) of non-governmental organisations actively involved in protected areas issues. Names are given in the original language or transliterated, with English translation in brackets as appropriate, and followed by the title of the post of the chief executive,

References

Key references (including all cited works) to the protected areas system, in particular, and nature conservation, in general, are listed.

ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

The annex includes the following sections:

Title: Name and number of law in the original language or transliterated, with the English translation underneath, as appropriate.

Date: Day, month and year of enactment, followed by dates of subsequent major amendments

Brief description: Summary of main provisions (often this is stated at the beginning of the legislation)

Administrative authority: Name of authority responsible for administering the law, given in the original language or transliterated, with the English translation underneath as appropriate. This is followed by the title of the post of the chief executive.

Designations: National designation of protected area in the original language or transliterated, followed in brackets by the English translation as appropriate. For each designation this would be followed by: definition of designation (if given in legislation), summary of activities permitted or prohibited, outline of penalties for offences, and, where relevant, reference to subsequent legislation relating to the original law.

Source: This may be "original legislation", "translation of original legislation" or a referenced secondary source.

MAPS and LISTS

The descriptive sections are followed by lists of protected areas, and maps showing their location. In most cases, the lists comprise all of those areas qualifying for inclusion in IUCN management categories I-VIII, which have an area of over 1,000 hectares. However, forest and hunting reserves qualifying for IUCN Management Category VIII have been largely omitted, because our information is not comprehensive. Also, size has been ignored for island nations. Note that in certain cases, nationally designated areas (such as some national parks) will not appear in the lists, as they do not meet the criteria. World Heritage sites, biosphere reserves and Ramsar sites are also listed.

Categories and management objectives of protected areas

- 1 **Scientific Reserve/Strict Nature Reserve:** to protect nature and maintain natural processes in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental monitoring, education, and for the maintenance of genetic resources in a dynamic and evolutionary state.
- II **National Park:** to protect natural and scenic areas of national or international significance for scientific, educational and recreational use.

- III **Natural Monument/Natural Landmark:** to protect and preserve nationally significant natural features because of their special interest or unique characteristics.
- IV **Managed Nature Reserve/Wildlife Sanctuary:** to assure the natural conditions necessary to protect nationally significant species, groups of species, biotic communities, or physical features of the environment where these require specific human manipulation for their perpetuation.
- V **Protected Landscape or Seascape:** to maintain nationally significant natural landscapes which are characteristic of the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal life style and economic activity of these areas.
- VI **Resource Reserve:** to protect the natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning.
- VII **Natural Biotic Area/Anthropological Reserve:** to allow the way of life of societies living in harmony with the environment to continue undisturbed by modern technology.
- VIII **Multiple-Use Management Area/Managed Resource Area:** to provide for the sustained production of water, timber, wildlife, pasture, and outdoor recreation, with the conservation of nature primarily oriented to the support of economic activities (although specific zones may also be designed within these areas to achieve specific conservation objectives).

Abridged from IUCN (1984). Categories and criteria for protected areas. In: McNeely, J.A. and Miller, K.R. (Eds), *National parks, conservation, and development: The role of protected areas in sustaining society*. Smithsonian Institution Press, Washington. Pp. 47-53

INTERNATIONALLY DESIGNATED SITES

In the field of nature conservation there are two international conventions and one international programme that include provision for designation of internationally important sites in *any* region of the world. These are the World Heritage Convention, the Ramsar (Wetlands) Convention, and the Unesco Man and the Biosphere (MAB) Programme. While there is a wide range of other international conventions and programmes, these cover only regions, or small groups of countries.

Both World Heritage sites and Ramsar sites must be nominated by a State that is party to the relevant convention. While there is an established review procedure for World Heritage sites (and nomination is no guarantee of listing), all nominated Ramsar sites are placed on the List of Wetlands of International Importance. Biosphere reserves are nominated by the national MAB committee of the country concerned, and are only designated following review and acceptance by the MAB Bureau.

Each Contracting Party to the Ramsar (Wetlands) Convention is obliged to nominate at least one wetland of international importance. However, a country can be party to the World Heritage Convention without having a natural site inscribed on the List, and may participate in the MAB programme without designating a biosphere reserve.

World Heritage Sites

The Convention Concerning the Protection of the World Cultural and Natural Heritage was adopted in Paris in 1972, and came into force in December 1975. The Convention provides for the designation of areas of "outstanding universal value" as World Heritage sites, with the principal aim of fostering international cooperation in safeguarding these important areas. Sites, which must be nominated by the signatory nation responsible, are evaluated for their World Heritage quality before being inscribed by the international World Heritage Committee. Only natural sites, and those with mixed natural and cultural aspects, are considered in this publication.

Article 2 of the World Heritage Convention considers as natural heritage: natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view; geological or physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation; and natural sites or precisely delineated areas of outstanding universal value from the point of view of science, conservation or natural beauty. Criteria for inclusion in the list are published by Unesco.

The following States Party to the Convention lie at least partially within the regions covered by this volume:

Benin
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African Republic
Congo
Côte d'Ivoire
Ethiopia
Gabon
Gambia
Ghana
Guinea
Kenya
Madagascar
Malawi
Mali
Mauritania
Mozambique
Niger
Nigeria
Senegal
Seychelles
Sudan
Tanzania
Uganda
Zaire
Zambia
Zimbabwe

The following natural and mixed natural/cultural World Heritage sites lie within the regions covered by this volume:

Cameroon
Dja Faunal Reserve

Central African Republic
Parc national de Manovo-Gounda-St Floris

Côte d'Ivoire
Taï National Park
Comoé National Park
Mount Nimba Strict Nature Reserve (with Guinea)

Ethiopia
Simen National Park

Guinea
Mount Nimba Strict Nature Reserve
(with Côte d'Ivoire)

Madagascar
Bemaraha Integral Nature Reserve

Mali
Bandiagara

Malawi
Lake Malawi National Park

Mauritania
Banc d'Arguin National Park

Senegal
Djoudj National Bird Sanctuary
Niokolo-Koba National Park

Seychelles
Aldabra Atoll
Vallée de Mai Nature Reserve

Tanzania
Mt Kilimanjaro National park
Ngorongoro Conservation Area
Serengeti National park
Selous Game Reserve

Zaire
Virunga National Park
Garamba National Park
Kahuzi-Biega National Park
Salonga National Park

Zambia
Victoria Falls/Mosi-oa-Tunya (with Zimbabwe)

Zimbabwe
Mana Pools National Park, Sapi and Chewore
Safari Areas
Victoria Falls/Mosi-oa-Tunya (with Zambia)

Ramsar Sites

The Convention on Wetlands of International Importance especially as Waterfowl Habitat was signed in Ramsar (Iran) in 1971, and also came into force in December 1975. This Convention provides a framework for international cooperation for the conservation of wetland habitats. The Convention places general obligations on contracting party states relating to the conservation of wetlands throughout their territory, with special obligations pertaining to those wetlands which have been designated to the "List of Wetlands of International Importance".

Each State Party is obliged to list at least one site. Wetlands are defined by the convention as: areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine waters, the depth of which at low tide does not exceed six metres.

The following States Party to the Convention lie at least partially within the regions covered by this volume:

Burkina Faso
Chad
Gabon
Ghana
Guinea-Bissau
Kenya
Mali

Mauritania
Niger
Senegal
South Africa
Uganda
Zambia

The following wetlands which lie within the region have been included in the List of Wetlands of International Importance:

Burkina Faso

Mare aux Hippopotames
 Mare d'Oursi
 Parc national du "W"

Chad

Réserve de la Biosphère du Lac Fitri

Gabon

Petit Loango
 Setté Cama
 Wongha-Wonghé

Ghana

Owabi

Guinea-Bissau

Lagoa de Cufada

Kenya

Lake Nakuru National Park

Mali

Lac Horo
 Séri
 Walado Debo/Lac Debo

Mauritania

Banc d'Arguin

Niger

Parc national du "W"

Senegal

Bassin du Ndiaël
 Delta du Saloum
 Djoudj
 Gueumbeul

South Africa

Barberspan
 Blesbokspruit
 De Hoop Vlei
 De Mond (Heuningnes Estuary)
 Kosi Bay System
 Lake Sibaya
 Langebaan
 Orange River Mouth
 St Lucia System
 Turtle Beaches/Coral Reefs of Tongaland
 Verlorenvlei
 Wilderness Lakes

Uganda

Lake George

Zambia

Bangweulu Swamps
 Kafue Flats

Biosphere Reserves

The designation of biosphere reserves differs somewhat from that of either of the previous designations in that it is not made under a specific convention, but as part of an international scientific programme, the Unesco Man and the Biosphere Programme. The objectives of a network of biosphere reserves, and the characteristics which biosphere reserves might display, are identified in various documents, including the Action Plan for Biosphere Reserves (Unesco, 1984).

Biosphere reserves differ from World Heritage and Ramsar sites in that they are designated not exclusively for protection of unique areas or significant wetlands, but for a range of objectives which include research, monitoring, training and demonstration, as well as conservation. In most cases the human component is vital to the functioning of the biosphere reserve, something which is not always true for either World Heritage or Ramsar sites.

The following biosphere reserves are located within the region:

Benin

Pendjari

Burkina Faso

Forêt classée de la mare aux hippopotames

Cameroon

Parc national de la Benoué
 Réserve forestière et de faune du Dja
 Parc national de Waza

Central African Republic

Bamingui-Bangoran Conservation Area
 Basse-Lobaye Forest

Congo

Dimonika
 Parc national d'Odzala

Côte d'Ivoire

Parc national de Taï
 Parc national de la Comoé

Gabon

Réserve naturelle intégrale d'Ipassa-Makokou

Ghana

Bia National Park

Protected Areas of the World

Guinea

Massif du Ziama
Monts Nimba

Kenya

Amboseli
Kiunga Marine National Reserve
Malindi-Watamu
Mount Kenya
Mount Kulal

Madagascar

Mananara Nord

Mauritius

Macchabee/Bel Ombre Nature Reserve

Nigeria

Omo Strict Nature Reserve

Rwanda

Parc national des Volcans

Senegal

Delta du Saloum
Parc national du Niokolo-Koba
Forêt classée de Samba Dia

Sudan

Dinder National Park
Radom National Park

Tanzania

Lake Manyara National Park
Serengeti-Ngorongoro

Uganda

Queen Elizabeth (Rwenzori) National Park

Zaïre

Vallée de la Lufira
Réserve forestière de Luki
Réserve floristique de Yangambi

AFRICAN CONVENTION

Title: The African Convention on the Conservation of Nature and Natural Resources

Date: 15 September 1968

Brief description: Provides, *inter alia*, definitions of strict nature reserves, national parks and special reserves. Also provides for conservation of the soil; water; flora and fauna, including special protection for named species. Provision is also made for regulating traffic in specimens and trophies and for education and development plans.

Designations:

a) "Strict nature reserve" means an area:

- i) under state control and the boundaries of which may not be altered nor any portion alienated except by the competent legislative authority;
- ii) throughout which any form of hunting or fishing, any undertaking connected with forestry, agriculture or mining, any grazing, any excavation or prospecting, drilling, levelling of the ground or construction, any work tending to alter the configuration of the soil or the character of the vegetation, any water pollution and, generally, any act likely to harm or disturb the fauna or flora, including introduction of zoological or botanical species, whether indigenous or imported, wild or domesticated are strictly forbidden;
- iii) where it shall be forbidden to reside, enter, traverse or camp, and where it shall be forbidden to fly over at low altitude, without a special written permit from the competent authority, and in which scientific investigations (including removal of animals and plants in order to maintain an ecosystem) may only be undertaken by permission of the competent authority.

b) "National park" means an area:

- i) under state control and the boundaries of which may not be altered or any portion alienated except by the competent legislative authority;
- ii) exclusively set aside for the propagation, protection, conservation and management of vegetation and wild animals as well as for the protection of sites, land-scapes or geological formations of particular scientific or aesthetic value, for the benefit and enjoyment of the general public; and

iii) in which the killing, hunting and capture of animals and the destruction or collection of plants are prohibited except for scientific and management purposes and on the condition that such measures are taken under the direction or control of the competent authority;

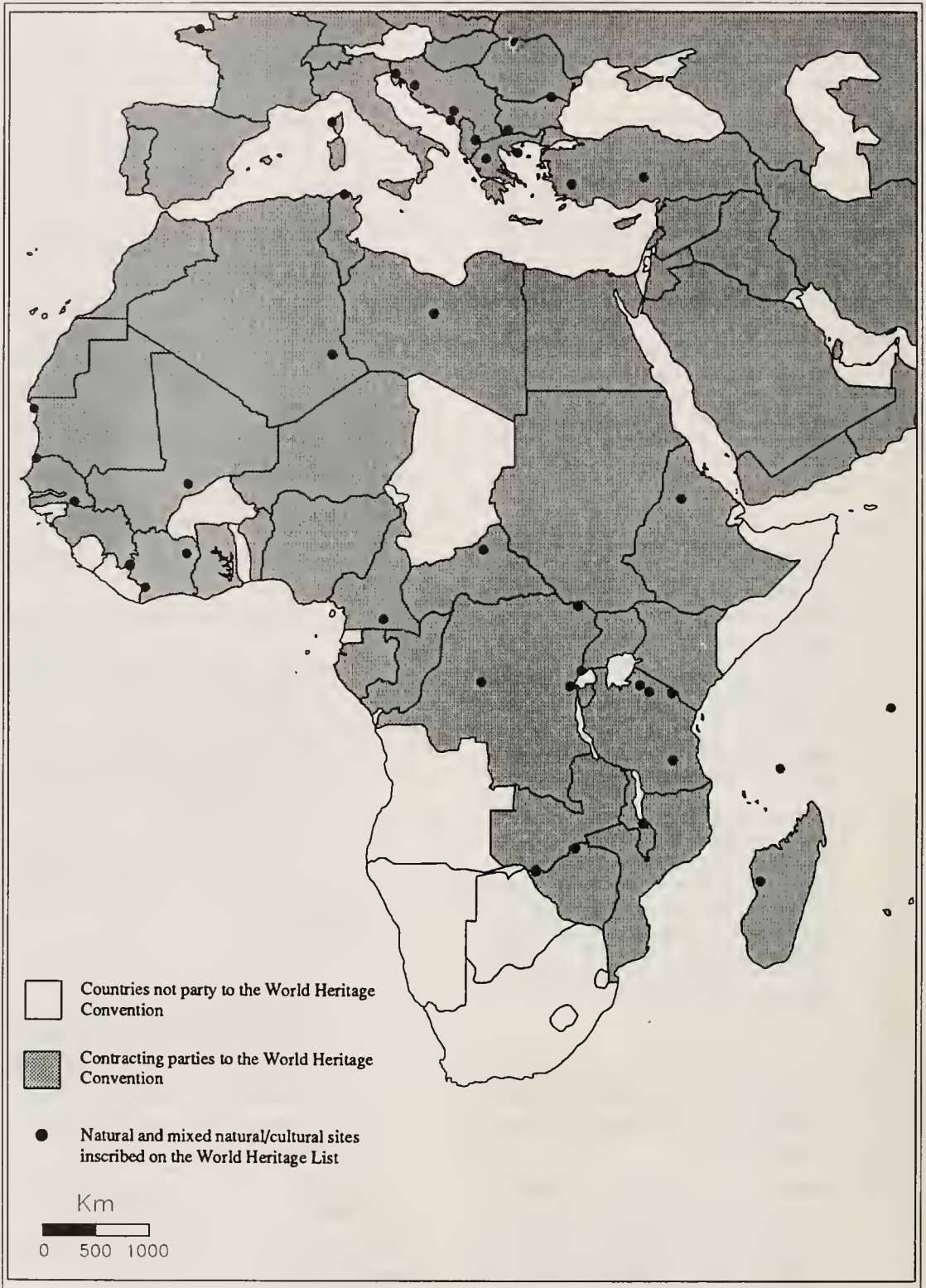
iv) covering any aquatic environment, to which all of the provisions of Section (b)(i)-(iii) above are applicable.

The activities prohibited in "Strict nature reserve" under the provisions of Section (a)(ii) of Paragraph (4) of this article are equally prohibited in national parks except in so far as they are necessary to enable the park authorities to implement the provisions of section (ii) of this paragraph, by applying, for example, appropriate management practices, and to enable the public to visit these parks; however, sport fishing may be practised with the authorization and under the control of the competent authority;

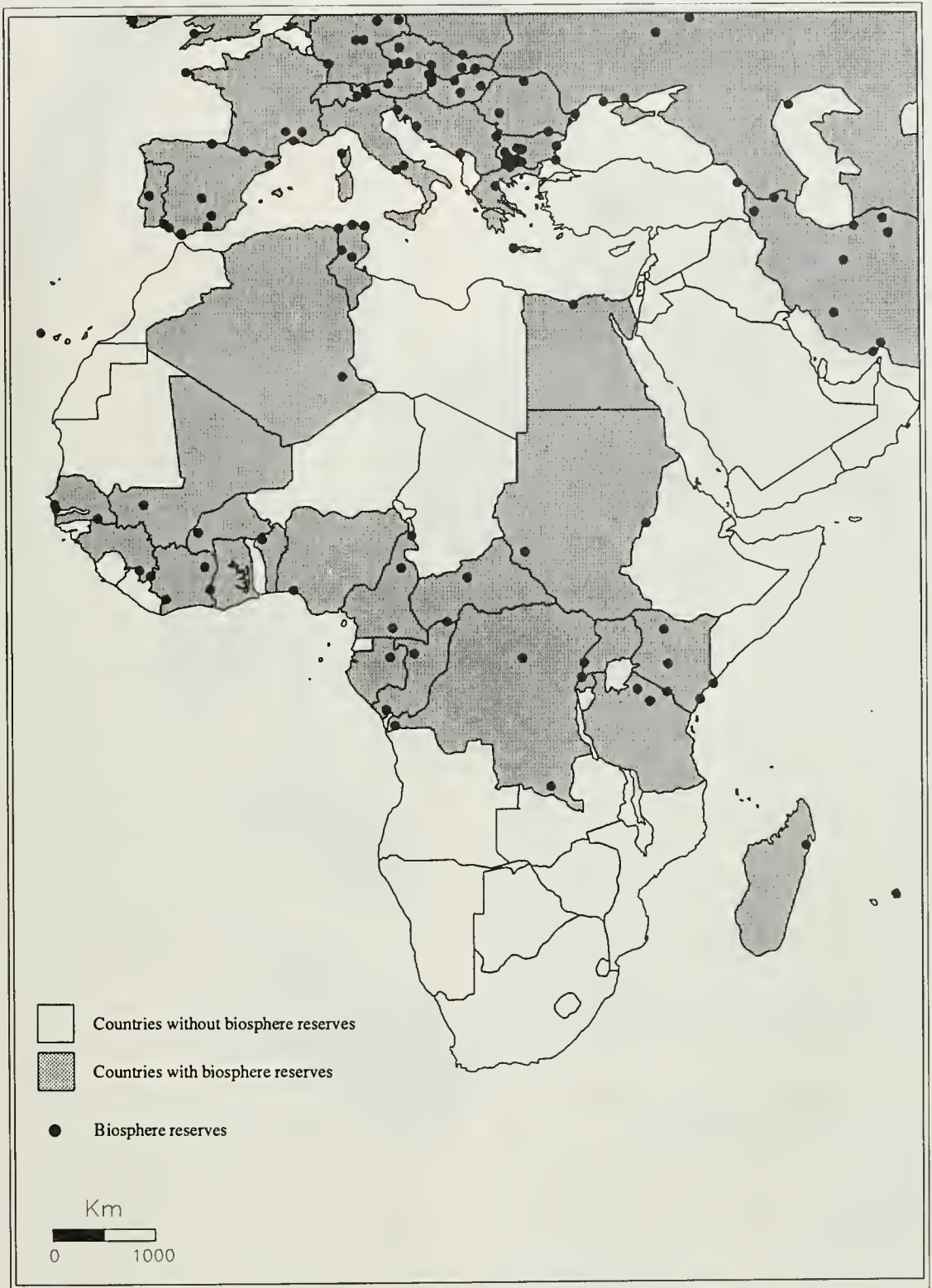
c) "Special reserve" means other protected areas such as:

- i) "game reserve" which shall denote an area
 - set aside for the conservation, management and propagation of wild animal life and the protection and management of its habitat,
 - within which the hunting, killing or capture of fauna is prohibited except by or under the direction or control of the reserve authorities,
 - where settlement and other human activities shall be controlled or prohibited;
- ii) "Partial reserve" or "sanctuary" which shall denote an area
 - set aside to protect characteristic wildlife and especially bird communities, or to protect particularly threatened animal or plant species, especially those listed in the Annex to this Convention, together with the biotopes essential for their survival,
 - in which all other interests and activities shall be subordinated to this end;
- iii) "soil", "water" or "forest" reserve shall denote areas set aside to protect such resources.

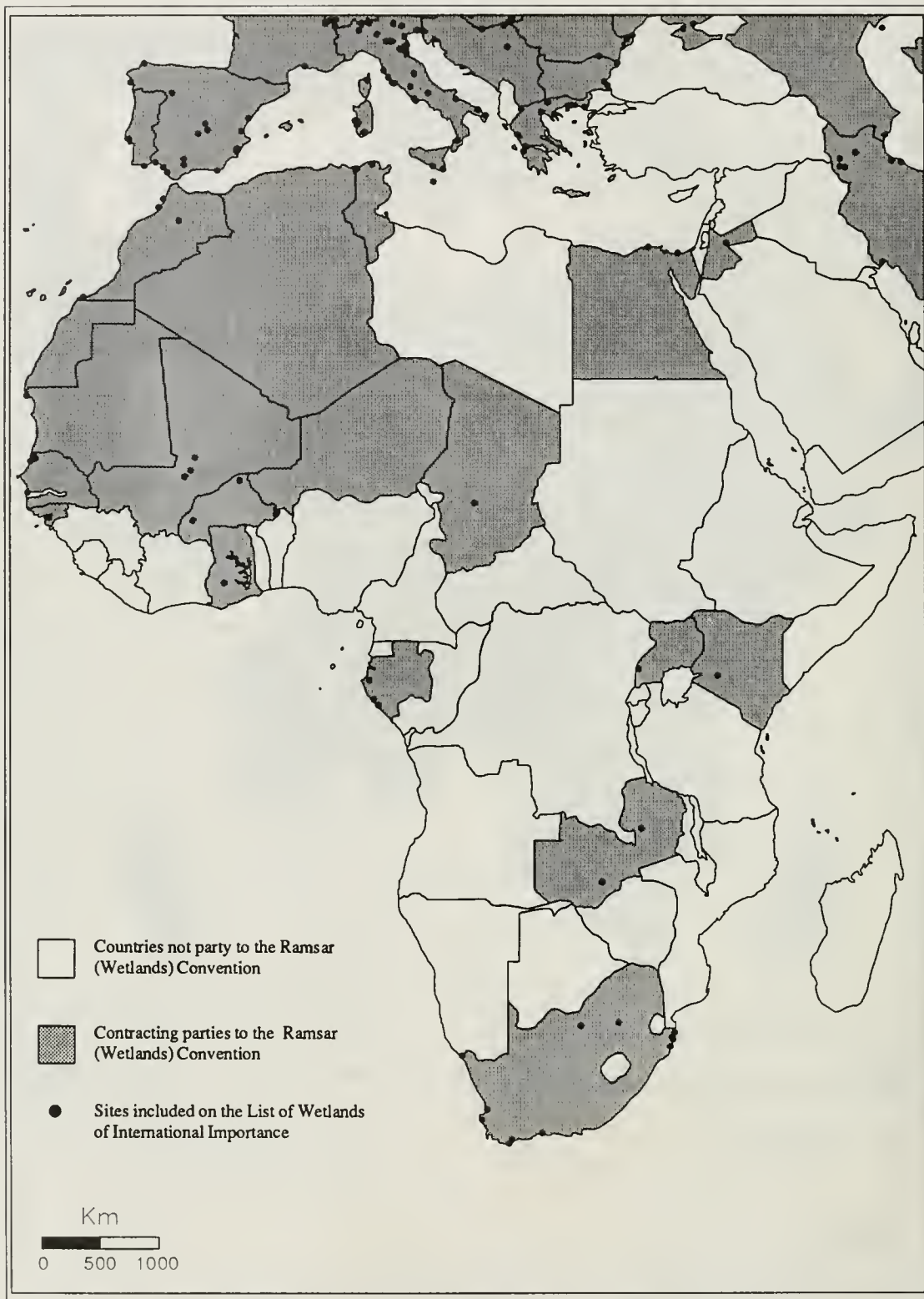
Source: Lyster, S. (1985). *International Wildlife Law*. Grotius Publications Ltd. 470 pp.



Internationally Designated Sites – World Heritage Sites



Internationally Designated Sites – Biosphere Reserves



Internationally Designated Sites – Ramsar (Wetlands) Convention

PEOPLE'S REPUBLIC OF ANGOLA

Area 1,246,700 sq. km

Population 8,500,000 (1990)

Natural increase: 2.7% per annum

Economic Indicators

GDP: US\$ 633 per capita (1987)

GNP: No information

Policy and Legislation The creation of national parks and reserves was first mentioned in the 1936 "Regulamento". Subsequently, the first national park, Parque Nacional de Caça do Iona, was established by Portaria No. 2421 of 2 October 1937 (Huntley, 1974a). Decree No. 40,040 of 20 January 1955 provided the first comprehensive nature conservation legislation, covering all aspects of conservation and utilisation of game and providing for the establishment of national parks, reserves and controlled hunting areas. It also established a Nature Conservation Council (Conselho de Protecção à Natureza), which laid out regulations governing national parks. The Regulamento de Caça was approved by virtue of Diploma Legislativo No. 2873 of 11 December 1957 and consisted of detailed legislation published in the period between 1957-1967. The Regulamento Florestal was established through Decreto No. 44 531 of the 21 August 1962 and provided extensive legislation with respect to forest resources. Subsequently, the National Parks Regulamento was established by virtue of Diploma Legislativo No. 22/72 of 22 February 1972. Diploma Legislativo No. 88/72, 1972 defined the category of regional nature park (Huntley, 1974a; IUCN, 1987b). The Regulamento de Caça of 1975 defined the protected area categories of strict nature reserve, partial reserve and special reserve (Huntley, 1974b).

The above statutes were revoked by Decree No. 43/77 of 5 May 1977 which approved the statute of the Ministry of Agriculture, and provided for five categories of conservation area: national park; strict nature reserve; partial reserve; regional nature park; and special reserve (see Annex). In many cases, these categories do not conform to international standards; protected areas are established under individual laws (IUCN, 1987b).

At present, national environmental policy and legislation is inadequate and current wildlife legislation does not cover issues such as rural community use of wildlife or the place of conservation within land-use policy. Wildlife legislation is in urgent need of revision and is seldom enforced. The lack of legislation for the conservation of natural monuments is mentioned by Huntley (1974b), who makes recommendations for several areas that could be gazetted under such legislation. A positive side of current legislation is that no attempt has been made to degazette the protected areas already established (IDF, 1991).

International Activities At an international level, Angola is not party to any of the major conventions dealing with protected areas. Further, Angola is not party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several protected area categories.

Administration and Management From 1955 until 1972, a number of departments were involved with natural resource management. The Nature Conservation Council, established in 1955, acted as an advisory board on matters such as conservation and utilisation of soil, fauna and flora. It was composed of the Governor General (as President), heads of all government departments, and representatives from the private sector. The administration of nature conservation policy was the responsibility of the Division of Veterinary Services (game and parks), the Division of Agricultural Services (forests, inland waters and soil conservation), and the Navy (marine life). The Repartição Técnica de Protecção à Fauna within the Veterinary Services was directly responsible for wildlife conservation throughout the country, as well as the administration of national parks, reserves and controlled hunting areas. In September 1969, the Liga para a Protecção e Conservação da Natureza was created in an attempt to speed up resource protection in the country (Anon., 1970). Following confusion as to conservation-related responsibilities, Diploma Legislativo No. 22/72, Regulamento dos Parques Nacionais of 22 February 1972 was issued, which clarified the situation and stipulated that all policy administration was the sole responsibility of the Repartição Técnica. The National Directorate of Nature Conservation (Direcção Nacional da Conservação da Natureza) (DNACO) assumed the above responsibilities upon its creation in 1977 (Decree No. 43/77) (IUCN, 1987b). This Directorate was subsequently superseded in 1989 by the Forestry Development Institute (Instituto de Desenvolvimento Florestal) (IDF), within the Ministry of Agriculture and Rural Development, by virtue of Decree No. 41/89 of 22 July 1989. A high priority for this Ministry is the conservation and sustainable utilisation of natural resources (IDF, 1991).

The Forestry Development Institute (IDF) is the central government agency responsible for wildlife conservation and the management of protected areas (IDF, 1991). It is headed by a Director who is supported by a Deputy Director, who oversees the activities of five departments: Forestry; Wildlife; Protection; Administration; and Regional Centres. Within the Wildlife Department in Luanda is found a Head of Department (1), upper management (4), technicians/clerical staff (5), and guards (17). As of 1991, resources available to IDF for protected area management amounted to less than US\$ 20,000 per year (IDF, 1991).

Within UNITA-administered areas, the official policy of the organisation has been to implement wildlife conservation programmes through a section of its civil administration the Wildlife Department, within the Ministry of Natural Resources. The 1991 peace accord between UNITA and MPLA established that the Luanda-based government structures, including IDF, remain the official national administration until a unified structure is developed following the 1992 elections (IDF, 1991).

Other institutions with environmental responsibilities are the National Directorate for Fisheries and Agriculture (DINOPA), the Institute for Agronomic Research and the Institute for Veterinary Research (both within the Ministry of Agriculture and Rural Development), and the National Department of Water in the Ministry of Industry (Stuart and Adams, 1990). The Associação Angolana do Ambiente (AAA) is a non-governmental organisation established in the early 1980s to promote environmental awareness, undertake basic research and monitoring, and to act as a lobby group for conservation action (IDF, 1991). The AAA has a small membership and is based in Luanda.

The entire park system has been placed upon the List of Threatened Protected Areas of the World since 1988, due to disruption caused by civil war, uncontrolled poaching and the loss of infrastructure. There is a serious lack of staff, resources and support, and only Kisama National Park is effectively functioning (Anstey, pers. comm., 1991). The country lacks even the initial resources to establish the foundations of an effective conservation system (IDF, 1991).

Systems Reviews Angola lies on the west coast of Africa between the equator and the Tropic of Capricorn, and is the largest country in southern Africa. It is bordered to the south by Namibia, to the north and north-east by Zaïre, to the east by Zambia and by the Atlantic Ocean on the west. It has abundant natural resources, large mineral and oil reserves, and a population density which is one of the lowest on the continent (IDF, 1991). Only 3% of the country is cultivated; 23% is classified as pasture, and 43% as forest/woodland. The country has an extraordinary range of biomes from lowland rain forests of the Cabinda enclave to the deserts of the south-west. Endemism is high, estimated at around 1,260 plant species, second in Africa only to Zaïre (Davis *et al.*, 1986). Further, Angola has one of the richest and most varied, yet least known wildlife resources in Africa (Huntley, 1974a).

Six geomorphological regions are distinguishable: the coast belt, the transition zone; the marginal mountain chain; the old (highland) plateau; the Congo basin; and the Zambezi-Cubango basin. The coast belt lies below 300m; the transition zone is a discontinuous escarpment area which varies from a series of gentle steps in the north, to steep scarps of over 1,000m; the marginal mountain chain is a narrow zone running along the edge of the transition zone. East of these zones are the plains

of the interior plateaux, with elevations ranging between 1,200-1,850m. The Congo basin penetrates Angola along the extensive peneplains of the southern Congo catchment, and the south-eastern third of the country is an undulating plain on deep Kalahari sands (Huntley, 1974a). The Cabinda enclave is separated from Angola by a narrow strip of Zaïre. It is primarily forested lowland, backed by forested hills to the north and east (Hughes and Hughes, 1991).

The country's biogeographical affinities are largely Zambebian, with Kalahari-Highveld and Karroo-Namib in the south-western coastal areas, Guinea-Congolian/Zambebian regional transition zone in the north, and Guinea-Congolian in Cabinda province (Stuart and Adams, 1990). The vegetation is a fairly uniform *Brachystegia/Julbernardia* miombo woodland, which together with other savanna and grassland areas covers about 90% of the country. The south-west and southern coastal areas are extensions of the hyper-arid Namib desert, and associations of broad-leaved tree savanna occur in the south and south-eastern areas (Davis *et al.*, 1986). The north supports isolated areas of evergreen and semi-deciduous rainforest, mostly in the Cabinda enclave. Congo savanna occurs in the north of the country; montane forest consists of a few isolated patches in the mountains of Huambo, Benguela and Huila districts; their combined area is less than 200ha, but are of great biogeographic interest. The escarpment zone supports a discontinuous series of moister but biologically distinct vegetation types (Huntley, 1974a). The rate of deforestation for closed broad-leaved forest has been estimated at 440 sq. km/annum out of a total of 29,000 sq. km (Huntley, 1974a; Davis *et al.*, 1986).

Apart from the arid south-west, most of the country is well-watered. Twenty-six perennial rivers reach the Angolan coast, most of them comparatively short. The principal wetlands are associated with the lower floodplains of rivers on the Central African Plateau such as the Cunene and Cuanza, in the southern and eastern parts of the country. Many permanent swamps occur in the upper reaches of the Cuanza and its tributaries, and strips of tall swamp forest occur along all rivers that flow into the Zaïre river. Most of the 1,650km coastline consists of soft marine sediments and supports large areas of mangroves (70,000ha) at the mouths of several rivers, and extensive salt marshes. The largest section of protected coastline is in Iona National Park, along the southern coastline (Burgis and Symoens, 1987; Hughes and Hughes, in press; Huntley, 1974a).

A number of conservation areas recognised today were first proclaimed by Portuguese colonial authorities in the 1930s in zones considered to be of low agricultural or economic potential (IDF, 1991). Very little of a wildlife programme existed, however, until the 1970s, when there was growing interest in conservation in the country, greater government support, improved protected areas management and the undertaking of the first national wildlife surveys (IDF, 1991). This progress

was halted by the civil war which broke out in 1976 and ended in May 1991.

Today, legally established protected areas, including national parks, strict nature reserves, partial reserves, regional nature parks, and special reserves cover an area of about 80,000 sq. km or 6.6% of total area (Horsten, 1982; IDF, 1991). In 1980 there were 18 forest reserves covering about 18,560 sq. km, but it is felt that they have received little attention since their establishment (IUCN, 1987b).

Priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986) and IUCN (1987a), in Stuart and Adams (1990), and in the recently approved Elephant Conservation Plan for Angola (IDF, 1991). These include: the need to integrate protection and management into rural development programmes; the establishment of new reserves in forests and grasslands of the north, highland and western escarpment areas; a redefinition of the boundaries of Kisama National Park to include both banks of the Cuanza and Longa rivers; the establishment of a lowland forest reserve in the Cabinda enclave; protection of the gallery forests of Cuanza Norte and the Zaïre border; and the need for marine habitat conservation measures.

Current conservation initiatives include the Elephant Conservation Plan, which contains a three-phase programme spread out over the next five years. Objectives of this programme are: to improve conservation infrastructure and protected area management; to improve the capability of conservation institutions; to establish monitoring and research systems for conservation management; to improve environmental awareness, legislation and policy; and to establish an integrated conservation and development programme. Actions within the programme to achieve these goals include: the establishment of an effective protected areas network, including the designation of multiple use areas; the creation of a state wildlife and conservation authority; the establishment of non-government conservation agencies; the initiation of a national conservation strategy; and development of national environmental policy and enactment of appropriate legislation. Many of these initiatives will require sources of funding. Regional SADCC Wildlife Sub-sector proposed projects with relevance to Angola include: a regional wildlife resources inventory; and infrastructure development in conservation areas (IDF, 1991).

Other Relevant Information With the ending of the 16-year civil war in May 1991, the opportunity is now provided to initiate conservation programmes in the country.

Addresses

- Instituto de Desenvolvimento Florestal (Director),
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MINA GRI: AN)
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das Pescas, CP 83, LUANDA
- Associação Angolana do Ambiente (Secretary General),
c/o Faculdade de Ciências (Biologia), Universidade
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ANNEX

Definitions of protected area designations, as legislated,
together with authorities responsible for their legislation.**Title:** Decree No. 43/77**Date:** 5 May 1977**Brief description:** Supported the creation of the National Directorate of Nature Conservation (Direcção Nacional da Conservação da Natureza, or DNACO) and created 5 protected area categories.**Administrative authority:** Forestry Development Institute (Director)**Designations:****National park** An area reserved for the protection, conservation and propagation of wild animal life and indigenous vegetation, for the benefit and enjoyment of the public.**Strict nature reserve** An area for the total protection of wild flora and fauna.**Partial reserve** An area wherein it is forbidden to hunt, kill or capture animals, or to collect plants, other than for authorised scientific or management purposes.**Regional nature park** An area reserved for the protection and conservation of nature, in which hunting, fishing, and the collection or destruction of wild animals or plants, and the execution of industrial, commercial or agricultural activities, is prohibited or conditioned.**Special reserve** An area where the killing of certain species, whose conservation is impossible by other means, is prohibited.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>National Parks</i>				
1	Bikuar	II	790,000	1964
2	Iona	VI	1,515,000	1964
3	Kameia	VI	1,445,000	1938
4	Kangandala	IV	63,000	1970
5	Kisama	V	950,000	1957
6	Mupa	VI	660,000	1964
<i>Integral Nature Reserves</i>				
7	Ilheu dos Passaros	IV	200	1973
8	Luando	IV	828,000	1955
<i>Regional Nature Park</i>				
9	Chimalavera	V	10,000	1974

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Angola

BENIN

Area 112,620 sq. km

Population 4.7 million (1989)
Natural increase: 3% per annum

Economic Indicators
GNP: US\$ 340 (1988)
GDP: US\$ 373 (1987)

Policy and Legislation From 1894 to 1960 Benin was a French colony known as Dahomey, which together with the present day territories of Burkina Faso, Côte d'Ivoire, Niger and Mali, formed part of the country of French West Africa, created under French colonialism.

Most legislation relating to nature conservation is based on old forestry texts of French West Africa. Under French colonial law, a decree of 10 March 1925 concerning hunting regulations and refuge parks in French West Africa (Arrêté fixant certaines conditions d'exécution portant réglementation de la chasse et instituant des Parcs de Refuge en Afrique Occidentale Française), was the first piece of legislation providing for protected areas in the region.

The forestry domain of French West Africa was defined by Decree No. 1704 AP of 24 July 1935, and promulgated in what is now Benin by Decree No. 1107/EFC of 9 July 1943. It provided for the establishment of classified forests and faunal reserves, although no faunal reserves were in fact created until 1952. Most of the remaining areas of forest were classified in some way under this Act (Sayer *et al.*, 1979). Legislation currently providing for forest matters is given in Law No. 87-012 of 21 September 1987 concerning the Forest Code (Loi No. 87-012 portant Code Forestier). This defines conditions under which exploitation is permitted, these being stated in greater detail in decree no 89-385 of 24 October 1989 concerning application of Law No. 87-012 of 21 September 1987 (CNTSCF, 1991).

The first national parks in West Africa were created by Arrêté No. 009/SET of 19 August 1954, including Parc national du "W", which extends across the border of Benin, Burkina Faso and Côte d'Ivoire (Sayer *et al.*, 1979).

Legislation providing for protected areas has also been produced since independence in 1960. Ordinance No. 71-141 of 6 September 1971 contained regulations on the protection of nature and the control of hunting, and provided for strict nature reserves and national parks (which both form part of the forest domain), special reserves and sanctuaries. It also provided for strict natural reserves and national parks to be classified by law and for total and partial faunal reserves and special reserves to be constituted by decree of the competent Ministry. This piece of legislation has been superseded by the current piece of legislation, Law No. 87-014

concerning nature protection and hunting in the Republic of Benin (Loi No. 87-014 portant réglementation de la protection de la nature et de l'exercice de la chasse en République du Bénin) of 21 September 1987 (see Annex). The provisions of this piece of legislation, passed following the county's change of name from Dahomey to Benin, are virtually identical to those of Ordinance No. 71-141.

International Activities Benin became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 14 June 1982, although to date no sites have been inscribed. One site has been accepted as a biosphere reserve under the Unesco Man and the Biosphere (MAB) Programme. Proposals exist for the establishment of a further biosphere reserve. Benin has not yet acceded to the Convention on Wetlands of International Importance especially as Waterfowl Habitat, but is a signatory to the 1968 (Algiers) African Convention of Nature and Natural Resources which provides definitions of strict nature reserves, national parks and special reserves.

A Conseil de l'Entente with Niger, Burkina Faso, Côte d'Ivoire and Togo provides an administrative structure for cooperation between neighbouring Francophone countries. A proposal to set up a single authority to manage the three contiguous "W" national parks in Burkina Faso, Benin and Niger, totalling over 1 million ha, and to raise funds for its operation, is being considered (Thorsell, 1990).

Administration and Management The Inspectorate of Nature Protection and Hunting (Inspection de la protection de la nature et de la chasse (IPNC) is one of four inspectorates of the Department of Water, Forests and Hunting (Direction des eaux, forêts et chasses). The other three sections are the southern, central and northern forestry inspectorates. For a number of years FAO and UNDP have been assisting the Benin government in development and management of its protected areas. This has resulted in the development of management plans for both national parks, and a number of detailed recommendations covering not only protected areas but also national conservation policy, tourism and conservation of sites and hunting (including sport hunting, subsistence hunting and game ranching). Proposals have been made by FAO consultants to establish a new department specifically for national parks and hunting, and various working documents and management plans have been drawn up. Since mid-1985, a major EC-funded project has rehabilitated Pendjari National Park and its infrastructure (wildlife protection and censuses, construction and maintenance of roads, bridges and park buildings). This is the first time that the EC has become directly involved with helping a national park in Africa. The overall objective of the project is to

protect the wildlife areas of northern Benin as a barrier against the southward spread of desertification (Verschuren *et al.*, 1989).

There are, however, problems in implementing these proposals due to lack of qualified staff (Sayer *et al.*, 1979). Protected areas management to date has largely not been effective, due to a lack of surveillance personnel. This has resulted in uncontrolled poaching and brush fires (which are gradually opening up savanna areas), the presence of cattle during certain seasons, and illicit clearance of natural vegetation (FAO, 1982; Green and Chardonnet, 1990; Okio *et al.*, 1983). Pendjari National Park, which protects the most important fauna in the country and thus is of greater interest to tourists, benefits from slightly better management (CNTSCF, 1991).

The World Wide Fund for Nature (WWF) currently runs one project in Benin, concerned with fuelwood consumption (WWF, 1991).

Systems Reviews Benin is a narrow country land with a 120km border on the Gulf of Guinea, the country broadening and rising towards the north. A sandy coastal plain, with extensive lagoons, marshes and freshwater lakes, rises gently to a low southern plateau at an altitude of 200-300m. The plateau extends north, covering most of the country, with isolated hills rising to 350-625m, interrupted by the Chaîne de l'Atakara, which traverses the country obliquely from south-west to north-east, reaching a maximum of 641m. From these mountains the land surfaces slope down to 150m along the course of the Pendjari River which forms the border with Burkina Faso in the north-west. In the north-east, the Niger River forms the border with Niger, at altitudes which decline from 175m to 161m in passing downstream (Green and Chardonnet, 1990; Hughes and Hughes, 1991).

Natural vegetation is mostly Sudanian woodland with abundant *Isobertinia*. In the north is an area of Sudanian woodland without characteristic dominants and in the south lowland Guineo-Congolian lowland rain forest interspersed with secondary grassland mosaic. Very small reserves of semi-deciduous rain forest remain in eastern Benin. Small areas of mangrove occur on the coast and around the coastal lagoons (Davis *et al.*, 1986; IUCN, 1983). An anomalous coastal dry zone gap in the predominantly forest vegetation of coastal West Africa, known as the "Dahomey Gap", occurs in the south-west of the country. The present vegetation cover has been greatly influenced by man. Cutting, burning and grazing by domestic animals has led to much of the closed forest being replaced by secondary savannas. In the extreme north, conditions approach those of the Sahelian steppes (Sayer and Green, 1984). Oil palms are cultivated on the sandy coastal plain. In the north, traditional subsistence agriculture such as cassava, yam, maize and sorghum has become unattainable with recent encroaching desertification (Bissio, 1989).

Currently 2.4% of the country, is protected in 24 reserves. Almost all protected areas, including the two

national parks ("W" and Pendjari), occur in the north, within the same vegetation type. The north is relatively undeveloped, with communication tending to be difficult, which gives some protection to wildlife. The national parks are contiguous with Niger's "W" National Park and Tamou Faunal Reserve, and Burkina Faso's "W" National Park and Arli, Singou and adjacent faunal reserves. Together, these protected areas are of major international importance for the conservation of West African savanna ecosystems (Green and Chardonnet, 1990). Other vegetation types, particularly closed forest, are substantially degraded. By the end of 1980 the remaining forest in Benin outside protected areas covered only 540 sq. km, less than 0.4% of the country. There are probably few opportunities to create new reserves, particularly in the southern part of the country where the population density is greater (MacKinnon and MacKinnon, 1986).

The final report of a long-term FAO project, examining the development of national parks, contains conclusions and detailed recommendations for future developments. In particular, proposals for improvements in the management and development of tourism in national parks are made. These include: an increase in qualified personnel and technical equipment; improving the infrastructure within reserves; increasing penalties and sanctions for breaches of the law; enforcing anti-poaching measures with the aid of Benin armed forces; continuing efforts within the Conseil de l'Entente to integrate Benin into the tourist circuit of Niger, Burkina Faso and Togo and improving the main roads and internal flights (FAO, 1982; Peters, 1978).

Other recommendations include developing collaboration with national and international scientific institutions to ensure that ecological surveillance within the parks continues; continuing efforts to ensure fundamental investment from abroad; defining management priorities for reserves, based on their scientific interest and identifying sites with tourist potential so that where possible their management can be made self-financing. Importantly, the report recognises that effective protection can only be achieved with the support of the local human population and therefore also recommends: recruitment of local people in the creation of all infrastructure; improvement of living conditions of local people with taxes received from exploitation of faunal reserves and development of local industry based on hunting produce and all other services which increase village revenue. Specific proposals are made to encourage game hunting, which is considered to be under-exploited. Prohibition of hunting is ineffective, means being insufficient to prevent illegal poaching. Therefore the introduction of game quotas is recommended, limiting the number of hunters. The development of areas for subsistence hunting by local populations is also recommended. Game ranching in areas subject to desertification is considered as a preferable alternative to agriculture and pastoralism.

The protected area system is reviewed by Green and Chardonnet (1990) who stress the need for greater levels of protection from settlement for existing protected areas, particularly in view of the foreseeable control and elimination of onchocerciasis and trypanosomiasis. These diseases have previously precluded human settlement of the savanna national parks, hunting zones and classified forests. Upgrading of the legal status and protection of some of the classified forests in central Benin is also proposed. Proposals to improve the protected area system are also given by Okio *et al.* (1983), Sayer (1981), Sayer and Green (1984), MacKinnon and MacKinnon (1986) and IUCN (1987).

Problems which arise outside the jurisdiction of protected area management control include: poaching (especially commercial poaching); transhumance of domestic animals, and the consequent damaging introduction of their parasites to wild animals; bushfires and illegal clearing (FAO, 1982; Sinsin and Heymans, 1988). The desertification of the Sahel which has occurred over the last two decades has increased pressure on Benin, with the arrival in the country of people and their cattle from Niger, Burkina Faso, Nigeria and Mali (CNTSCF, 1991).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No 87-014 portant réglementation de la protection de la nature et de l'exercice de la chasse en République du Bénin (concerning regulations on nature protection and hunting in the Republic of Benin)

Date: 21 September 1987

Brief description: Provides definitions of areas listed below

Administrative authority: Service de Faune et Parcs Nationaux, Direction des Eaux, Forêts et Chasse

Designations:

Réserve naturelle intégrale (Strict nature reserve)
Area in which the ecology may not be disturbed, with no external intervention permitted other than measures deemed indispensable by scientific authorities responsible for the protection of the reserve

Activities prohibited include: hunting and fishing; forestry, mining, grazing, agriculture or prospecting; any activity leading to alteration to the ground or vegetation; water pollution; activity leading to damage or change to the fauna or flora; introduction of any wild or domestic, indigenous or exotic, animal or plant species.

In which it is also prohibited to live, enter, travel, camp, or fly at low altitude without permission

Parc national (National park) Area under state control, the boundaries of which may not be altered, nor any part unclassified other than by law

Set aside for the protection, conservation and propagation of wildlife and plants, and for the protection of land and geological formations of particular scientific or aesthetic interest

Prohibited activities include those given for strict nature reserves unless they are necessary to enable the authorities to implement provisions in the previous paragraph, and to enable the public to visit the park.

Réserve de faune (Faunal reserve) For the conservation, planning and propagation of wildlife and for the protection and management of its habitat; in which hunting, killing and capture of animals and

other human activities are totally prohibited other than under the direction and control of the competent authority; houses are prohibited.

Zone cynégétique (Sport hunting zone) A faunal reserve in which only sport hunting is permitted, this being subject to special restrictions. These restrictions are taken by the competent authority to regulate movement in each zone (routes and tracks traversing or alongside the zone).

Réserve spéciale (Special reserve) or Sanctuaire (Sanctuary) An area set aside for the protection of characteristic communities of animals, in particular, wild birds, or the protection of threatened animal or plant species, notably those listed in annexe 1 of this law, and the biotopes essential to their survival.

All other activities are subordinate to the achievement of this objective.

Source: Original legislation in French

Title: Décret No. 90-366 portant modalités d'application de la Loi No. 7-014 du 21 septembre 1987, sur la réglementation de la protection de la nature et de l'exercice de la chasse en République du Bénin (concerning methods of application of Law No. 87-014 on regulations concerning nature protection and hunting in the Republic of Benin)

Date: 4 December 1990

Brief description: Provides regulations concerning hunting, and conditions under which exploitation is permitted in sport hunting zones

Administrative authority: Service de Faune et Parcs Nationaux, Direction des Eaux, Forêts et Chasse

Designations:

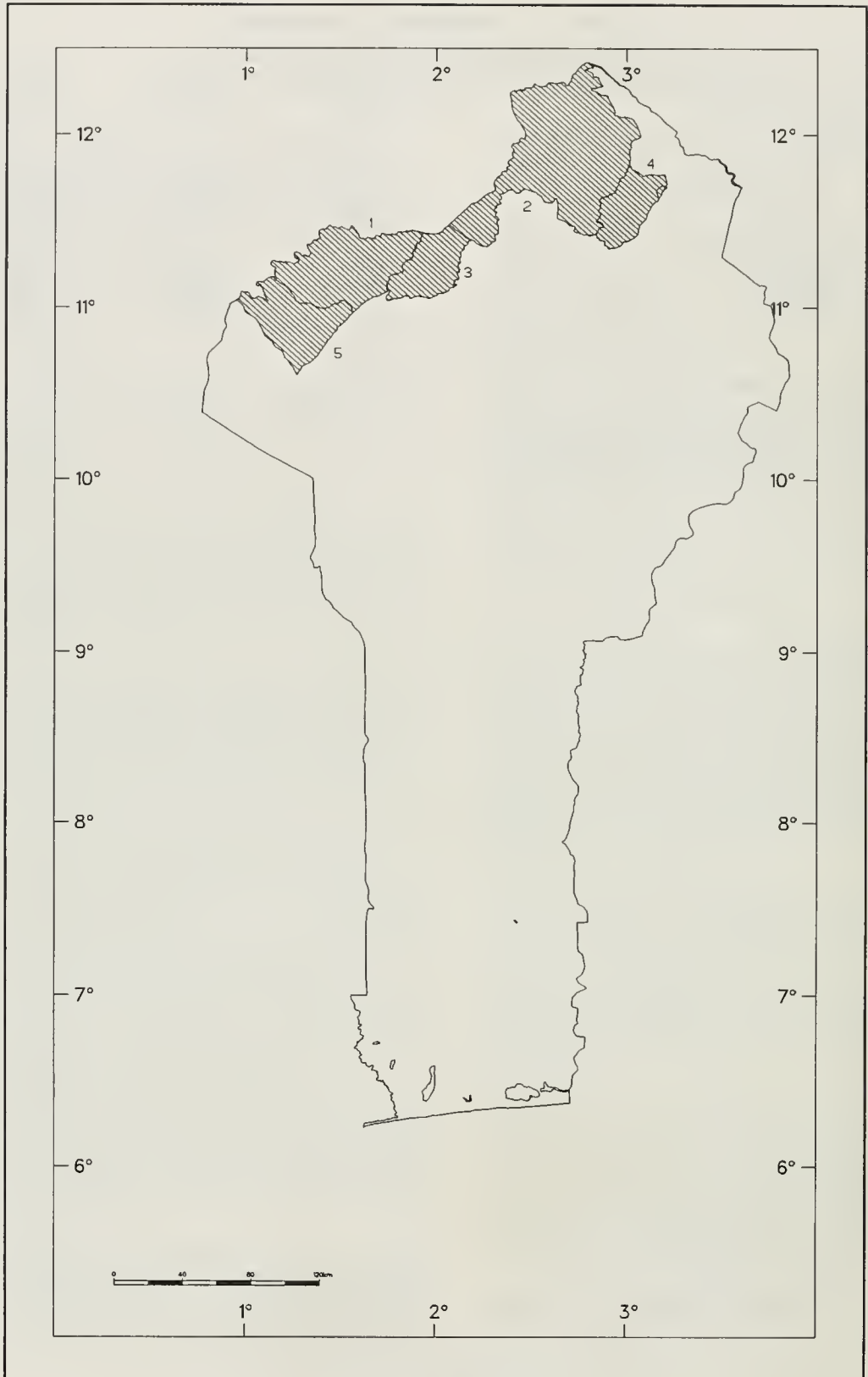
Zone cynégétique (Sport hunting zone) and Zone tampon (Buffer zone) Entry and travel is prohibited unless prior written permission is obtained

Prohibited activities include: movement at night off communally used paths, movement at any time outside routes and tracks open to the public.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Boucle de la Pendjari	II	275,500	1961
2	W du Benin	II	568,000	1954
	<i>Hunting Zones</i>			
3	Atakora	VIII	175,000	1980
4	Djona	VIII	225,000	1980
5	Pendjari	VIII	200,000	1980
	<i>Biosphere Reserve</i>			
	Réserve de la biosphère de la Pendjari	X	880,000	1986



Protected Areas of Benin

REPUBLIC OF BOTSWANA

Area 581,730 sq. km

Population 1,304,000 (1990)

Natural increase: 3.45% per annum

Economic Indicators

GDP: US\$ 1,661 per capita (1987)

GNP: US\$ 1,050 per capita (1988)

Policy and Legislation The Bechuanaland Protectorate, now Botswana, was a British Protectorate between 1885 and 1966, with the first game law being introduced in 1891. In 1932 all game was protected in the Chobe district, a prohibition that lasted until 1943 (Spinage, n.d.).

Several extant laws relate to areas designated for wildlife. The Fauna Conservation Act, 1961, amended in 1979, provides for the establishment of game reserves, sanctuaries, private game reserves and controlled hunting areas (see Annex). The National Parks Act of 1968 and its subsequent amendments covers the establishment, control and management of national parks; Subsidiary Orders constitute various national parks and provide for their specific regulations. Statutory Instrument No. 22, also enacted in 1968, declared a number of controlled hunting areas (Hannah *et al.*, n.d.). Definitions for the various protected area categories generally follow those found in international legislation, although FAO (1977) notes that under the Fauna Conservation Act only vertebrate species are mentioned; in practice, protection is provided for the whole ecosystem. The above areas are designated by order of the Head of State, and confirmed by a resolution of the legislature (see Annex). A Wildlife Conservation and National Parks Bill, amalgamating both the Fauna Conservation Act and the National Parks Act and their related regulations, is currently being promulgated (Modise, pers. comm., 1992).

The 1970 Tribal Lands Act provided a legal basis under which wildlife management areas (WMAs) were to be gazetted; the 1975 Tribal Grazing Land Policy (TGLP) provided a conceptual basis for WMAs as part of the zoning proposals for tribal land; and the Fauna Conservation Amendment Act (No. 1 of 1979) established the authority to create WMAs (Hannah *et al.*, n.d.; IUCN, n.d.; Republic of Botswana, 1975). The Fauna Conservation (Unified Hunting) Regulations, 1979 (S.I. No. 19) give all citizens equal rights to hunt in WMAs and controlled hunting areas (CHAs), for which quotas are set, subject to the other conditions of the Fauna Conservation Act (see Annex). When the proposed wildlife management areas are gazetted, a policy for each will be formulated by the local District Authority and the Department of Wildlife and National Parks. Once policy is determined, detailed management plans will be drafted and incorporated into the legislation. These plans will be implemented jointly by

the district authorities and Department of Wildlife and National Parks (DWNP). The proposed Wildlife Conservation and National Parks Bill outlines the regulations governing activities in the WMAs (Modise, pers. comm., 1992).

Indigenous woodlands are protected within forest reserves, gazetted under the Laws of Botswana: Forest, 38:04 of 1976 (see Annex). Any area on state land may be declared a forest reserve by the President, while local authorities may propose to the Minister that forest reserves be established on Local Authority Land, the proposal then being forwarded to the President by the Minister (Laws of Botswana, 1976). Hunting is allowed within the forest reserve network (Alidi, pers. comm., 1991).

The Wildlife Conservation Policy, contained in Government Paper No. 1, 1986, clearly states that Botswana's wildlife resource must be seen in terms of its potential contribution to the economic well-being of the nation, as well in terms of its heritage and aesthetic value. Therefore, while importance is accorded to national parks and reserves, in particular for tourism, education and the protection of significant areas, the policy develops further the idea of wildlife management areas and the rational use of wildlife (Republic of Botswana, 1986).

Government Paper No. 1 of 1990 outlines the goals of the National Conservation Strategy which are, *inter alia*, to increase the effectiveness with which natural resources are used and managed, and to integrate the work of the many sectoral Ministries and environmental interest groups throughout Botswana. The strategy also proposes the formation of a National Conservation Strategy Advisory Board and a Co-ordination Agency (already created), responsible directly to the Cabinet. This Agency is to liaise with all ministerial and local government authorities, as well as parastatal and private organisations to promote Governmental environmental policy (Government of Botswana, 1990; Hancock, 1991; Modise, pers. comm., 1991, 1992).

International Activities At an international level, Botswana is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). Botswana does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Botswana is signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area. Botswana is also a member of the Southern African Development Coordination Conference (SADCC) and the Southern African

Regional Commission for the Conservation and Utilisation of the Soil (SARCCUS), which have sectors responsible for the conservation and management of natural resources.

Administration and Management Environmental responsibility is divided between a number of ministries. The Department of Wildlife and National Parks (DWNP), within the Ministry of Commerce and Industry, is responsible for the management of national parks and game reserves, regulation of hunting, implementation of environmental education programmes, and research and monitoring of wildlife and habitats. The DWNP evolved out of the Game Control Unit, which was established in 1956 to control elephant in the Tuli area (Spinage, n.d.). The education unit within the Department is responsible for promoting public awareness, interpretation of wildlife legislation, and information services through public meetings and school programmes. In 1989, a Division of National Parks was set up within the DWNP (Modise, pers. comm., 1991). Adams (1990) recommends that national parks and game reserves should become the responsibility of a parastatal body.

The Ministry of Commerce and Industry also oversees the Department of Tourism which is responsible for the marketing and promotion of Botswana as a tourist destination. The Department of Water Affairs in the Ministry of Mineral Resources and Water Affairs is, *inter alia*, involved in management issues concerning the Okavango Delta (Stuart and Adams, 1990).

Forest reserves are administered by the Forestry Division of the Department of Crop Production and Forestry within the Ministry of Agriculture. The Forestry Unit within the Forestry Division operates through a system of 12 district forest officers (Hannah *et al.*, n.d.). The management of forest reserves, established before national parks and game reserves, and conservation areas are closely linked in Botswana (Alidi, pers. comm., 1991). The Division of Land Utilisation, within the Ministry of Agriculture, is responsible for fisheries, range ecology, communal areas management and bee-keeping.

Tribal lands are administered by local authorities and it is not possible to create national parks in them unless the land is donated to the President. Mashatu Game Reserve is the largest private reserve in Botswana (IUCN, 1990).

The most influential conservation-oriented NGO is the Kalahari Conservation Society (KCS), formed on 12 August 1982. KCS is concerned with broad environmental issues of national importance, and supports wildlife conservation policies, encourages research into issues affecting wildlife and their conservation, and promotes knowledge of the country's wildlife resources and environment through its education unit and educational materials. It also funds projects relating to protected areas (IUCN, 1990b; KCS, 1988). Other wildlife conservation-orientated NGOs are

the Chobe Wildlife Trust (CWT) and the Tshomarelo Okavango Conservation Trust (TOCT) which were established in 1988 and 1991 respectively (Modise, pers. comm., 1992). The Botswana Society encourages research and scholarship with emphasis, *inter alia*, on archaeology, environmental use and natural history; the objectives of the Forestry Association of Botswana include the protection of indigenous trees and bushes, and promotion of research into local forestry (IUCN, 1990). A wildlife training centre was established at Maun to train game scouts in conservation and management.

A collaborative programme for the management of the contiguous Gemsbok National Park of Botswana and the Kalahari Gemsbok National Park of South Africa is being considered. Furthermore, Botswana is assessing sites for potential trans-border parks with its other neighbours (Modise, pers. comm., 1992).

The difficulties facing the Department of Wildlife and National Parks are similar to those faced by most such departments in Africa, including a lack of sufficient manpower, funds, equipment and infrastructure (IUCN, 1987a); international assistance and finance are required to remedy the current shortage of trained personnel and equipment in the parks system. A high-cost/low-volume tourism policy is being encouraged, and it is envisaged that considerable financial and ecological dividends will be realised in the long term (Modise, pers. comm., 1991). The Central Kgalagadi Game Reserve (CKGR) was added to the IUCN Commission on National Parks and Protected Areas list of Threatened Protected Areas of the World in 1984 and a recommendation to nominate the CKGR a biosphere reserve is being considered by the Department of Wildlife and National Parks (Modise, pers. comm., 1992).

Systems Reviews Botswana is completely landlocked, being bordered by Zimbabwe to the north-east, South Africa to the east and south, and Namibia to the west, while the Caprivi Strip (Namibia) very narrowly separates the country from Angola and Zambia to the north. Most of the country (84%) is a flat or undulating plain on Kalahari sands, which dominates the western, southern and central regions at an average altitude of about 900m. The east is rockier and more broken, with numerous small hills. Less than 6% of the country is arable, in the north and east. Two large features dominate northern Botswana; the Okavango Delta and the Makgadikgadi salt-pans, each among the largest of their kind in the world (WCMC, 1991). About 71% of total land area is under tribal jurisdiction, 23% is under state control and 6% is freehold (Williamson, n.d.). Only 2% of the country is classified as "cultivated", 2% is classified as forest/ woodland, and 73% as pasture (Stuart and Adams, 1990).

Botswana falls primarily in the Kalahari-sandveld biogeographical region, and the Zambebian region in the north and north-east. The Kalahari is largely a semi-arid *Acacia*-dominated savanna on deep sands, becoming

dryer and more sparsely vegetated in the south (Hughes and Hughes, 1991). The Zambezian regions are characterised by taller and moister woodlands, with mopane *Colophospermum mopane* and Zambezi teak *Baikiaea plurijuga* being mutually exclusive dominants over vast areas.

The only perennial rivers in the country are the Okavango, Chobe and Linyanti, all situated in the extreme north. There are extensive wetlands in the Okavango Delta, and large areas of halophytic vegetation in the surrounds of the Makgadikgadi pans (Stuart and Adams, 1990). About 80% of the Okavango Delta is protected in the form of Moremi Game Reserve and its adjoining WMAs, whereas part of the Linyanti and Chobe river system frontage is protected within the Chobe National Park and Kwando WMA (Modise, pers. comm., 1992).

Botswana supports 14 major ecosystem types, nine of which are represented in national parks and game reserves (Hannah, *et al.*, n.d.). Protected areas, comprising national parks, game reserves and educational reserves, account for about 17% of the total area (IUCN, 1987a). Proposed WMAs account for another 22%, bringing the total of land protected under these categories to over 39% (Government of Botswana, 1990; Mordi, 1989; Modise, pers. comm., 1992). There is a total of six forest reserves, covering an area of 455,500ha, which primarily contain dry woodland types and are commercially logged.

Certain priorities to develop the protected areas network have been identified in IUCN (1987a, 1987b) and MacKinnon and MacKinnon (1986), and in Stuart and Adams (1990). Major recommendations include: the creation of conservation areas at Tsodilo Hills (currently gazetted as a national monument) and at the Kwebe, Lepakola, Tswapong, Mabeleapodi, Shoshong and Mokwane Hills, Pataletsabe Hill, the Aha Mountains, the Notwane-Limpopo area, the Tamafupa-Jari pan complex and Shashe Elephant Reserve; improved conservation of the Okavango Delta, and the listing of the Okavango Delta wetlands under the Ramsar Convention; the extension of Chobe National Park to the Linyanti River swamplands, and possibly to the adjacent Chobe Forest Reserve; a reduction in the use of veterinary fences in certain areas where they affect migration between protected areas, such as between Gemsbok National Park and Central Kgalagadi Game Reserve; the continued establishment of wildlife management areas around protected areas, so as to support sustainable-yield hunting; and extension of the southern boundary of Nxai Pan National Park to link up with Makgadikgadi Pans Game Reserve (Stuart and Adams, 1990; Modise, pers. comm., 1992).

There have been a number of recent initiatives in the development of the protected areas network. Moves are afoot to upgrade certain game reserves to national park status under the proposed Wildlife Conservation and National Parks Bill (Modise, pers. comm., 1992). An

inventory of natural resources and forests was due to start in September 1990, the goals of which are to provide a masterplan for efficient utilisation on a sustainable basis of all forests, within an integrated land-use framework. It will allow for broad-based utilisation of forest products, including fuelwood, medicines and wildlife management, in conjunction with sustainable logging and timber processing (Hanmer, pers. comm., 1991).

WMAs are being developed (through the Natural Resources Management Project funded by USAID) in response to the combined needs for the conservation and controlled utilisation of wildlife outside gazetted protected areas, and the necessity for buffer zones between protected areas and areas of more intensive land-use (Government of Botswana, 1990). Their establishment is proposed in seven of the ten districts in large areas of marginal and sub-marginal lands, forming buffer zones around most of the existing national parks and game reserves. It is intended that wildlife utilisation will be the primary land use in WMAs (primarily game-viewing, safari hunting and harvesting/citizen hunting zones), with other land uses permitted if they are compatible. The responsibilities for WMAs has been devolved to the Districts with the Department of Wildlife and National Parks retaining responsibility for monitoring, setting quotas and conducting research. The demands for new grazing land for cattle has, however, led to encroachment into some of the proposed WMAs.

Threats to protected areas include mineral prospecting, disruption of wildlife migration routes due to game fences, and in the case of Central Kgalagadi Game Reserve, the proposed trans-Kalahari railway. Poaching is a concern in Botswana, and attempts are being made to combat this directly and through public relations campaigns (Modise, pers. comm., 1992). Developments in and around the Okavango Delta could threaten this ecosystem.

Addresses

- Department of Wildlife and National Parks (Director), Ministry of Commerce and Industry, PO Box 131, GABORONE (Tel: 350500)
- Forestry Division (Director), Department of Crop Production and Forestry, Ministry of Agriculture, Private Bag 003, GABORONE (Tel: 350500; FAX: 356027)
- Kalahari Conservation Society (Executive Officer), PO Box 859, GABORONE (Tel: 314259/351131; Tlx: 2700 BD)
- Chobe Wildlife Trust (CWT), PO Box 43, KASANE
- Tshomarelo Okavango Conservation Trust (TOCT), Private Bage 13, MAUN
- The Botswana Society, PO Box 71, GABORONE
- Forestry Association of Botswana, PO Box 2088, GABORONE

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their legislation

Title: The Fauna Conservation Act

Date: 1961, amended 1979

Brief description: Defines game reserves and sanctuaries, private game reserves and controlled hunting areas

Administrative authority: Department of Wildlife and National Parks (Director)

Designations:

Game reserve No hunting or capturing of any animal is allowed, apart from in pursuance of authorised scientific activities, wildlife management or protection of life and property.

Sanctuary No hunting or capturing of any animal is allowed apart from in pursuance of authorised scientific activities, wildlife management or protection of life and property.

Controlled hunting area No hunting or capturing of any animal is allowed except in accordance with regulations established for each area.

Private game reserve May be declared by the President, upon application by the owner of private land, under such terms as the President may specify regarding protection or hunting of wild animals.

Source: Original legislation

Title: The Fauna Conservation (Amendment) Act

Date: 1979 (No.1)

Brief description: Made substantial changes to the Fauna Conservation Act of 1961 and created new authority to establish wildlife management areas.

Administrative authority: Department of Wildlife and National Parks (Director)

Designations:

Wildlife management area (WMA) Areas wherein hunting is specifically controlled

Source: Original legislation

Source: Original legislation

Title: The Forest Act

Date: 1976

Brief description: Describes the regulations pertaining to forest reserves and their creation

Administrative authority: Forestry Division (Director)

Designations:

Forest reserve Any area declared by the President in pursuance of the provisions of the Act, which may be on state land or on local authority land.

Felling, cutting, burning or removal are prohibited, although licenses may be issued for the collection and removal of forest produce within the reserve; fees and royalties may be paid.

Kasane FoR is gazetted under this Act.

Source: Original legislation

Title: The National Parks Act

Date: 1968 (amended in 1976 and 1979)

Brief description: Covers control, establishment and management of national parks

Administrative authority: Department of Wildlife and National Parks (Director)

Designations:

National park Established for propagation, protection and preservation of wild animal life and vegetation, as well as objects of geological, ethnological, historical and other scientific interest.

Killing and capturing of any animal, or the cutting and destruction of any vegetation within the park is prohibited.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Chobe	II	1,057,000	1968
2	Gemsbok	II	2,400,000	1971
3	Nxai Pan	II	150,000	1971
	<i>Wildlife Sanctuary</i>			
4	Maun	IV	8,500	
	<i>Game Reserves</i>			
5	Central Kgalagdi	II	5,180,000	1961
6	Khutse	IV	260,000	1971
7	Mabuasechube	IV	166,500	1971
8	Makgadikgadi Pans	IV	413,000	1970
9	Moremi	IV	390,000	1965

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Botswana

BURKINA FASO (UPPER VOLTA)

Area 274,200 sq. km

Population 8.7 million (1989)

Natural increase: 2.8% per annum

Economic Indicators

GNP: US\$ 230 (1988)

GDP: US\$ 201 (1987)

Policy and Legislation In the 1930s and 1940s, Burkina Faso, together with the present-day territories of Côte d'Ivoire, Benin, Niger and Mali, formed part of French West Africa, created under French colonialism. Under French colonial law, the Decree of 10 March 1925 "fixing certain conditions concerning hunting regulations and the institution of refuge parks in French West Africa" (Arrêté "fixant certaines conditions d'exécution portant réglementation de la chasse et instituant des Parcs de Refuge en Afrique Occidentale Française") provided for the establishment of refuge parks. National parks were first provided for under the Decree of 4 August 1954 concerning transformation of three total faunal reserves in French West Africa into national parks (Décret "portant transformation en parcs nationaux de trois réserves totales de faune existant en Afrique Occidentale Française") (Spinage and Souleymane, 1984). Following independence in 1960, legislation providing for protected areas has been produced by the Burkinabe government.

Ordinance No. 68-59/PRES/AGRI-EL on the conservation of fauna and the practice of hunting in Upper Volta of 31 December 1968 (see Annex) provides amongst other things for the designation of faunal reserves (réserves de faune), strict nature reserves (réserves naturelle intégrale), national parks (parcs nationaux), special reserves (réserves spéciale) and sanctuaries (sanctuaires). Legislation to provide for the administration of protected areas is given in Decree No. 83-327/CNR/PRES/MET (1983) concerning reorganisation of the Ministry of the Environment and Tourism (portant réorganisation du Ministère de l'Environnement et du Tourisme) and in Raabo No. AN-VI 035/FP/MET/SG/DEF of 20 February 1989, concerning the role and composition of the General Department of Water and Forests (Direction Générale des Eaux et Forêts).

A law Zatu No. AN VIII-0039 Bis/FP/PRES of 4 June 1991 (see Annex) distinguishes between basic forms of land tenure. The land is divided into urban zones and rural zones. Rural zones comprise: classified domain (domaine classé), which is classified by legislation; protected domain (domaine protégé) and private domain (domaine privé) (MET, 1991).

Decree No. 74/364/Pres/PL.DR.ET established the Volta Valleys Management Authority (Aménagement des vallées des Voltas), which has the right by

presidential decree, to develop in any way it sees fit the land under its jurisdiction, some of which is protected areas (Luts, 1975).

The National Committee for the Battle against Desertification (Comité National de Lutte contre la Désertification) (CNLcD) was established by Kiti No. ANIV - 232 CNR/ETOUR of 31 December 1986 to coordinate the activities of the National Action Plan for the Environment, the National Plan for the Battle against Desertification and the Tropical Forest Action Plan.

International Activities Burkina Faso became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 2 April 1987, although to date no sites have been inscribed. One site has been accepted as a biosphere reserve under the Unesco Man and the Biosphere (MAB) Programme. Burkina Faso acceded to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) on 27 June 1990, under which three sites are inscribed. Ordinance 68-50 ratifies the 1968 (Algiers) African Convention of Nature and Natural Resources. In 1979 Burkina Faso became only the second African country to ratify the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) which is important for the conservation of migrant species from Europe.

A proposal to set up a single authority to manage the three contiguous "W" national parks in Burkina Faso, Benin and Niger, totalling over 1 million ha, and to raise funds for its operation, is being considered (Thorsell, 1990).

Administration and Management Burkina Faso is currently following its second Five-Year Plan for Popular Development (Plan quinquennal de développement populaire) (PQDP). This provides for the medium-term growth and development of the environment and tourism for 1991-1995, and incorporates the National Action Plan for the Environment (Plan d'action national pour l'environnement) (PANE), which in turn incorporates the National Plan for the Battle against Desertification (Plan National de Lutte contre la Désertification) (PNLcD). The Tropical Forest Action Plan for Burkina Faso (Plan d'action forestier tropical du Burkina Faso) (PAFT), detailed in the Orientation Document produced by the Ministry of the Environment and Tourism in 1990, forms part of the PNLcD (Anon., 1990). The Tropical Forest Action Plan is designed to contribute to the protection of the country's natural resources and to its socio-economic national development.

Management and exploitation of all land within the public domain (classified forests, parks, faunal reserves) is the direct responsibility of the Department of Forests

and Fauna (Direction des forêts et de la faune), which is one of four departments comprising the General Department of Water and Forests in the Ministry of the Environment and Tourism (Anon., 1990). Duties include: the defence of forests; prevention of forest fires; control of animals; delimitation and demarcation of classified forests; evaluation of forests; development of management plans, and management of any clearance. In 1987, the Ministry of the Environment and Tourism had 757 personnel, of which 575 were within the forest sector. The legislation states that they should collaborate with the provincial Departments of the Environment and Tourism, as well as with other ministerial departments.

In some instances, protected areas fall under the control of the Volta Valleys Management Authority as well as under the Ministry of Water and Forests and as a result some protected areas have been taken for development without being declassified (Luts, 1975).

Although establishment of protected areas has a long history, most reserves exist only on paper. While considerable advances have been made in legislative protection of wildlife, there has been little or no law enforcement in most of the proclaimed conservation areas because of lack of finance, equipment, and trained personnel. Land-use conflicts with local people have resulted in widespread illegal hunting, fishing, cattle grazing, woodcutting, and land-clearance for agriculture in many of the country's legally protected wildlife areas (Heringa *et al.*, 1990; IUCN, 1989). Poaching is heavy for various reasons. The country's borders are easily crossed, and the situation of protected areas favours transfrontier poaching; the local people are poor, and modern hunting methods make poaching easy; there is insufficient management of protected areas due to lack of equipment of the forest service (MET, 1991).

The only area which receives a reasonable (but still inadequate) level of management as a national park, including infrastructure for the reception of tourists, is Arli Total Faunal Reserve, which is often referred to as "Arli National Park". The gazetted national parks, W and Kabore Tambi, receive only rudimentary protection, are difficult of access and have not been developed for tourism. The most effectively protected wildlife area in Burkina Faso at present is Nazinga Game Ranch. This is the site of the Nazinga Wildlife Utilisation Pilot Project, which was approved by the Burkinabe government in 1979 as a five-year cooperative programme between the government and the African Wildlife Husbandry Development Association (a Canadian non-profit organisation). The Nazinga project has demonstrated successfully the influence on wildlife populations of effective protection and habitat management, but progress towards achieving a positive attitude to wildlife conservation among rural people has been limited (Heringa *et al.*, 1990).

Penalties for infringement of the law are given as fines of F CFA 10,000-500,000 and prison sentences of three months to two years. Penalties are doubled in faunal

conservation areas (MET, 1991). Under the Sahel programme, in 1989, IUCN established a Natural Resources Management Programme-Southern Burkina. This programme has included: management and planning of Kabore Tambi National Park; involvement of local people in training rural populations and development of a schools environmental education programme, including the production of a bulletin (Zooni) to be distributed to local schools (IUCN, 1990; MET, 1991).

Systems Reviews Most of the country is occupied by the Mossi plateau, which is 200-500m high with a general declination to the south. On the northern border the dune belt comprises dunes reaching heights of 29-30m and aligned west-east. Lowlands less than 200m high penetrate the country from the south-west as a narrow strip 225km long in the valley of the Black Volta River, and also in the central southern part in the valleys of the Red and White Volta rivers. There are three highland blocks which rise above 500m; one in the south-west close to the border with Mali, the others in the centre of the country to the north-west and north-east of Ouagadougou (Hughes and Hughes, 1991).

The country is a vast stretch of semi-arid savanna which can be divided along a north-south gradient into three distinct vegetation zones corresponding to the relative density, growth-form and height of the woody perennial species. The northern half of the country in the Sahelian zone is thorn-bush shrub savanna, the vegetation grading into an area of sand dunes with few trees or shrubs at the northern limit. Sudanian *Isoberlinia* savanna of open grassland scattered with deciduous trees predominates in a broad band from east to west in the centre. Woodland occurs in the south-west of the country, which is far less prone to drought and has more frequent areas of perennial water. Tree species are larger and also far more numerous in absolute number, and in some areas the canopy may be nearly closed. Well-developed gallery forests occur along perennial rivers. The principal wetlands are seasonally inundated riverine flood plains, none of which is very large in comparison with those of neighbouring countries. There are permanent lakes and ponds, generally swamp-fringed, on some of the larger floodplains (Anon., 1980; Davis *et al.*, 1986; Hughes and Hughes, 1991).

The vegetation shows the influence of overgrazing, intensive harvest of fuelwood, drought and complete conversion for cultivation (Anon., 1980). Cultivated land, which has poor quality soil, is subject to severe desertification, and is largely used for subsistence farming, together with some cotton and peanuts (Bissio, 1988). The more fertile south-west woodland area is sparsely populated or cultivated because it is plagued with tse-tse flies which carry sleeping sickness, and onchocerciasis. Although only about one-third of cultivable land is effectively used for agricultural activities, there is also serious pressure and exploitation from the long tradition of itinerant agriculture associated with migrant populations (Anon., 1990). Wood is the

most widely used source of energy, and bushmeat is an important source of protein for local people, so the increase in human population size has meant that both forests and wildlife have been seriously overexploited (Bissio, 1988; Lutts, 1975).

All acts classifying forests and faunal reserves in Burkina Faso were made before independence in 1960. Fauna conservation areas were first set up in 1926, when five 'parcs de refuge' were established covering some 536,700ha. Since then there have only been declassification of forests, modifications to boundaries and changes in statute. In 1951, classified forests were redesignated faunal reserves, within which the aim was to prohibit all, or practically all hunting. Since 1955, 2,087 sq. km of partial faunal reserves have been created, although these were administered as hunting reserves. The area now known as "W" National Park was one of the original "parcs de refuge", and has remained a park ever since. In 1953 it was made a total faunal reserve (réserve total de faune) and in 1954, a national park, when legislation providing for national parks was first introduced. This was followed by the gazettelement of Po National Park (now known as Kabore-Tambi National Park) in 1974. Arli Total Faunal Reserve and Deux Balé Classified Forest, created in 1954 and 1937, respectively, have been managed as 'national parks' since 1967, but have not been gazetted officially as such. Three other total faunal reserves have also been created, as well as partial faunal reserves which are administered as hunting zones (zones de chasse) (Spinage and Souleymane, 1984).

A serious reduction in wildlife led to a complete ban on hunting from 1980-1985, but limited hunting was permitted again from 1985-1986. The management of Nazinga Classified Forest as a game ranch has been a result of this.

The protected area system now covers 12% of the country. However, distribution of protected areas is uneven. One reserve alone, the Sahel Partial Faunal Reserve on the northern border, covers 5% of the country. The remaining protected areas, which cover just under 7% of the country, are located largely in the south, with very little land in the centre of the country being included. According to Spinage and Souleymayne (1984), the faunal reserves are too small to be of importance in protecting wildlife. The original aim of the forest regime was to classify 30% of the country, although there was no prospect of being able to manage such an area.

In an outline of the conservation strategy for the improvement of the protected areas system, the Ministry of the Environment and Tourism recognises the need for the acceptance by the general public, and in particular by local populations directly concerned with an area, of the need to manage wildlife. To this end, the report emphasises the need to permit subsistence hunting to satisfy essential needs of the population living in hunting zones, without permitting any commercial hunting (MET, 1987).

Management proposals in the Tropical Forest Action Plan (Anon., 1990) include: improving the management of protected areas; developing environmental education; promoting cooperation with neighbouring countries; promotion of hunting associations; promotion of industries linked to wildlife. Specific measures to improve management include delimiting protected areas, creation of infrastructures to survey and manage protected areas and ensuring adequate trained personnel to manage wildlife.

Proposals for the improvement of the protected area system are given by various authors. Spinage and Souleymane (1984), in their account of the history of faunal conservation (Résumé des aires de faune protégées et propositions), give suggestions to increase the number, size and designation of protected areas and to classify two areas as biosphere reserves. The areas would cover the principal ecological zones and would aid the battle against desertification, providing small islands of habitat protection. They recommend that Seno-Mango (which has been proposed as a biosphere reserve), representing the only areas of relatively unmodified Sahel vegetation remaining in Burkina Faso, should be given effective protection as a matter of urgency. Furthermore, they recommend that the rest of the Sahel Partial Faunal Reserve should be degazetted, since it is densely settled and has been severely overgrazed.

Heringa *et al.* (1990) make various proposals, focused on maintaining the country's antelope population. These include: promotion of greater participation by local communities in wildlife protection and utilisation; establishment of three additional national parks by upgrading and extending Diefoula-Logoniegue Classified Forests to become Comoé-Leraba National Park, upgrading Arli and Singou reserves to become Arli National Park, and establishing Deux Balé National Park in the existing Deux Balé and Dibon classified forests. A biosphere reserve is proposed at Seno-Mango in the northern Sahel zone.

The protected areas system of Burkina Faso is reviewed in IUCN (1989), MacKinnon and MacKinnon (1986) and IUCN (1987). Although the country has received considerable financial assistance from FAO with parks planning and the preparation of management plans, further international aid in the form of technical assistance for implementing management is still needed (MacKinnon and MacKinnon, 1986). The increase in population size has put great pressure on all natural resources and led to degradation of many ecosystems. Protected areas have been subject to poaching, bushfires, unauthorised felling and clearance, encroachment by villages, overgrazing, unawareness of park limits and removal of boundary markers, drought and desertification (Anon., 1990; Issa, 1983; Lutts, 1975).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Ordonnance 68-059/PRES/AGRI-EL sur la conservation de la faune et l'exercice de la chasse en Haute-Volta (Ordinance on the conservation of fauna and the control of hunting in Upper Volta)

Date: 31 December 1968

Brief description: Provides amongst other things for the designation of protected areas listed below

Administrative authority: Direction des forêts et de la faune (Department of Forests and Wildlife)

Designations:

Réserve naturelle intégrale (Strict nature reserve)
(i) An area under state control, the boundaries of which may not be altered nor any portion alienated except by the competent legislative authority, where no exterior intervention is permitted except for essential measures for the protection of the reserve.

(ii) Strictly forbidden activities include: any form of hunting or fishing; any undertaking connected with forestry, agriculture or mining, and grazing; any excavation or prospecting, drilling, levelling of the ground or construction; any work tending to alter the configuration of the soil or the character of the vegetation; any water pollution; and, generally, any

act likely to harm or disturb the fauna or flora, including introduction of zoological or botanical species, whether indigenous or imported, wild or domesticated.

(iii) An area where it shall be forbidden to reside, enter, traverse or camp, and where it shall be forbidden to fly over at low altitude, without a special written permit from the competent authority, and in which scientific investigations (including removal of animals and plants in order to maintain an ecosystem) may only be undertaken with permission from the competent authority.

Parc national (National park) (i) An area under state control, the boundaries of which may not be altered nor any portion alienated except by the competent legislative authority.

(ii) An area exclusively set aside for the propagation, protection, conservation and management of vegetation and wild animals, as well as for the protection of sites, landscapes or geological formations of particular scientific or aesthetic value, for the benefit and enjoyment of the general public.

(iii) An area in which the killing, hunting and capture of animals and the destruction or collection of plants are prohibited except for scientific and management purposes and on the condition that such measures are taken under the direction of the competent authority.

Activities prohibited include those listed under natural integral reserves (ii), except in so far as they are necessary to enable the park authorities to implement the provisions of section (ii) of this paragraph.

Réserve de faune (Faunal reserve) An area for the conservation, management and propagation of wild animal life and the protection and management of its habitat, within which hunting, killing or capture of fauna is prohibited except with official permission.

Settlement or other human activity is controlled, or prohibited.

Réserve totale de faune (Total faunal reserve) A faunal reserve for all fauna

Réserve partielle de faune (Partial faunal reserve) For particular species, or for conditions stated in the text gazetted the reserve.

Réserve spéciale (Special reserve) or Sanctuaire (Sanctuary) An area for the protection of characteristic wildlife, especially bird communities, or to protect particularly threatened animal or plant species, especially those listed in the annex to this convention together with the biotopes essential for their survival.

Source: Luus, 1975

Title : Décret No. 70/302/PRES/AGRI L/F portant classement de forêt, réserve sylvo-pastorale et partielle de la faune du Sahel (Decree No. 70/302/PRES/AGRI L/F concerning classification of forests, sylvo-pastoral reserves and partial faunal reserves of the Sahel)

Date: 1970

Brief description: Provides *inter alia* for the designation of partial faunal reserves, sylvo-pastoral reserves and protected forests and classified forests

Administrative authority: Le Service de la Protection et de l'Aménagement des Forêts (Forest protection and management service)

Designations:

Réserve partielle de faune (Partial faunal reserve)

Réserve sylvo-pastorale (Sylvo-pastoral reserve)

Forêt classée (Classified forest) Forest not managed by the Forest Service, in which sustainable exploitation of wood is permitted

Forêt protégée (Protected forest) Forest managed by the forest service

Sources: Spinage and Souleymane, 1974; Kambou, pers. comm., 1991

Title: Zatu No. AN VIII-0039 Bis/FP/PRES

Date: 4 June 1991

Brief description: Provides definitions of categories listed below

Administrative authority:

Designations:

Domaine classé (Classified domain) classified by legislation, and belongs to the state

Sport hunting permitted by professional hunters

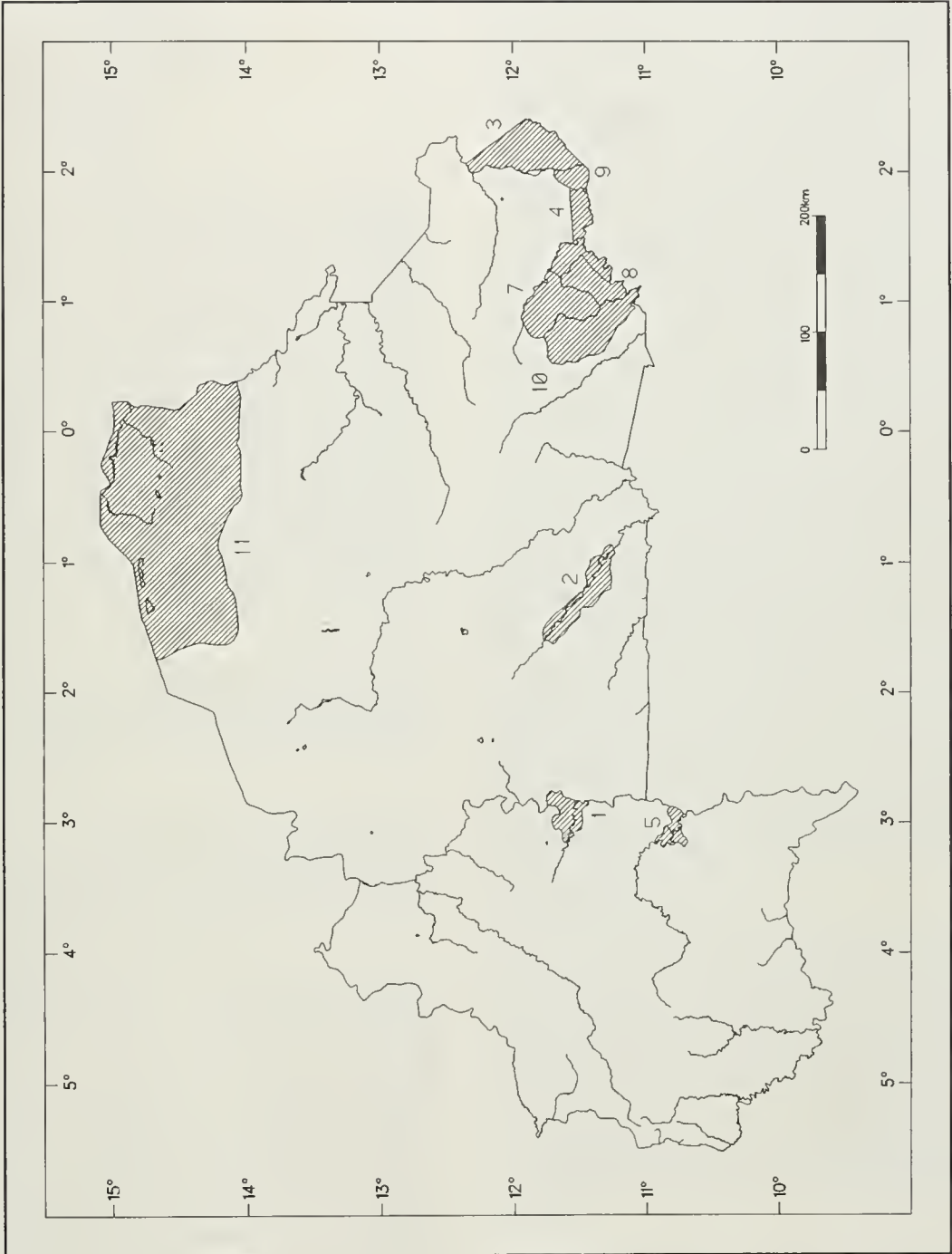
Domaine protégé (Protected domain) For intense human activity (agriculture, breeding, hunting, gathering etc.). Subsistence hunting by local people is permitted.

Domaine privé (Private domain)

Source: MET, 1991

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Deux Bales	II	56,600	1967
2	Kabore-Tambi	II	242,700	1976
3	W du Burkina Faso	II	190,000	1954
	<i>Total Faunal Reserves</i>			
4	Arly	IV	76,000	1954
5	Bontioli	IV	12,700	1957
7	Singou	IV	192,000	1955
	<i>Partial Faunal Reserves</i>			
8	Arly	IV	130,000	1954
9	Kourtiagou	IV	51,000	1957
10	Pama	IV	74,700	1955
11	Sahel	IV	1,600,000	1970
	<i>Biosphere Reserve</i>			
	Forêt classée de la Mare aux hippopotames	X	16,300	1986
	<i>Ramsar Wetlands</i>			
	Mare aux hippopotames	R	16,300	1990
	Mare d'Oursi	R	45,000	1990
	Parc national du "W"	R	235,000	1990



Protected Areas of Burkina Faso

BURUNDI

Area 27,731 sq. km (of which 2,000 sq. km forms part of Lake Tanganyika)

Population 5.5 million (1989)
Natural increase: 3.3% per annum

Economic Indicators
GNP: US\$ 240 (1988)
GDP: US\$ 227 (1987)

Policy and Legislation Burundi is one of the few African countries not to have had a national park established during the colonial era (Kabayanda, 1985), although all forest land was established as official reserves by the Belgian colonial authorities in 1933. Until 1980 there was no legislation concerning protected areas, but since then the situation has improved. Decree-Law No. 1/6 of 3 March 1980 (see Annex) establishes national parks (*parc nationaux*) and nature reserves (*réserves naturelles*). It is an important piece of legislation in the struggle to preserve fauna and flora, and in principal covers all aspects essential to achieve its stated aims (INCEN, 1985). Activities prohibited within national parks and nature reserves, and penalties to be imposed for any infractions, are specified. The Decree-Law also states that both reserve boundaries and reserve management plans should be determined by decree.

The Forest Code of 25 March 1985 (see Annex) provides, amongst other things, for the establishment of protection forests (*forêts de protection*), forest reserves (*réserves forestiers*) and reforestation areas (*périmètres de reboisement*).

Decree No. 100/47 of 3 March 1980, concerning the creation and organisation of the National Institute for the Conservation of Nature (INCEN) (*portant création et organisation de l'Institut national pour la Conservation de la Nature (INCEN)*), established the aims and structure of the INCEN (now the INECN).

International Activities Burundi became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 19 May 1982, although to date no sites have been inscribed. It is a signatory to the 1968 (Algiers) African Convention on the Conservation of Nature and Natural Resources, which provides for strict nature reserves, national parks and special reserves. The country is not party to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention). No sites have been inscribed under the Unesco Man and the Biosphere (MAB) Programme. An Unesco mission in 1979 recommended the establishment of three biosphere reserves but there has been no follow up (Zimmermann, 1982).

Administration and Management The National Institute for the Environment and the Conservation of Nature (L'Institut National pour l'Environnement et la Conservation de la Nature) (INECN), until recently known as the National Institute for the Conservation of Nature (INCEN) and directly attached to the Presidency, is responsible for the creation and management of national parks and nature reserves. Its other responsibilities are: to organise scientific studies; to encourage diversification of tree and animal species; to ensure maximum use of tourist sites, in collaboration with the National Office of Tourism; to train technicians in nature conservation and to make proposals to the President of the Republic for new sites to be protected as parks or reserves. The composition of the Administrative Council of INECN, which includes government officials, is provided for. Penalties for infractions of the law within national parks and nature reserves include one month prison sentences, fines, and the confiscation of items illegally obtained. Compensation for relocation is payable to locals inhabiting areas designated as national parks and nature reserves, according to procedures outlined in the Decree of 24 July 1956 concerning expropriation in the public interest (*rélatif à l'expropriation pour cause d'utilité publique*). Although the INCEN has been attempting to improve the protected area system, it recognises that protection has not been effective, due to settlements within protected areas, compounded by a lack of expertise and finance. The elimination of cultivation, grazing, fishing and logging, which is currently occurring in all proposed protected areas, is difficult, due to the enormous population pressure. The government is trying to encourage people to move by offering them alternative areas to settle. Of particular concern to INCEN is Ruvubu National Park where 3,000 families need to be resettled; an extremely costly exercise (Kabayanda, n.d.(b); Zimmerman, 1982).

The Forest Service is responsible for managing areas within the state forest domain. The Forest Code (see Annex) stipulates penalties (fines and prison sentences of six months to five years) to be imposed for infractions against the law within the forest domain. These penalties are doubled when the area involved is a protection forest or forest reserve. The Forest Code also provides for compensation to be paid to the owner of a forest, for loss of earnings, in the event that the land is classified as a protection forest, taking into account the future increase in value of the land as a result of the measures taken by the state.

A National Institute for the Safety of Nature has been established to advance the more rational management of forest resources (Ndabaneze, 1990).

Systems Reviews Burundi is situated in the highlands along the eastern arm of the Western Rift Valley. The

land surface only falls below the 1,000m contour along the shores of Lake Tanganyika (773m). A mountain range, the Zaïre-Nile ridge reaching 2,679m, runs roughly north-south along the western boundary, providing the highest land in the country. From its watershed western streams descend steeply to Lake Tanganyika (Hughes and Hughes, 1991). Most of the country is made up of flat plateaux and relatively low hills. The great variations in topography, soil and climate are responsible for the occurrence of a large number of vegetation types (Bider, 1974).

Natural vegetation comprises mostly a mosaic of east African evergreen bushland and secondary *Acacia* wooded grassland, with large areas of Afromontane communities in the west. *Brachystegia-Julbernardia* (miombo) woodland exists along the south-east border, and small patches of transitional rain forest in the north-west (Davis *et al.*, 1986). Levels of plant endemism are unknown but considered unlikely to be high (Brenan, 1978). There are no published lists of rare or threatened plants. However, reports suggest that the vegetation is now seriously degraded. The forest, which formerly covered the whole length of the Zaïre-Nile ridge, has been attacked on all sides by cultivation and woodcutting. The mountain flora is reviewed by Ndabaneze (1990). In the south it has almost completely disappeared (Verschuren, 1977), yet represents critically important centres of biological diversity. Hillside farming, based on inappropriate techniques, inherently erodible soils and frequent violent rains have combined to create some of the worst soil erosion problems in the world (Zimmerman, 1982).

Wetlands comprise a number of small lakes in the mountains and four substantial lakes including Lake Tanganyika, about 8% of the surface of which is situated in Burundi. Flood plains and permanent swamps occur along many of the rivers, especially in the headwater regions, and on the lower plateaux (Hughes and Hughes, 1991). Lake Tanganyika, the second deepest lake in the world, contains an exceptional aquatic fauna, with more than 300 species of fish, 90% of which are endemic. It also contains molluscs similar to marine fossils from the Jurassic era (Bider, 1974).

Most inhabitants engage in subsistence agriculture, with maize, cassava, sorghum and beans being the principal crops grown. The land is also heavily grazed by livestock (Verschuren, 1977). Coffee is the main agricultural export product (Bissio, 1988).

Burundi has been considered to represent "a conservationist's nightmare" (Zimmermann, 1982). It is one of the most densely populated countries in Africa, with over 300 people/sq. km in some areas, and one of the poorest in terms of per capita GNP. During the first half of this century, rapid conversion of the montane forests to pasture land led to virtually all remnant forest lands being set aside as official reserves in 1933. Despite this, the resulting pressure on land use meant that conservation received low priority, although advances

have been made to try and improve the situation. After an official visit to the country in 1976, Verschuren recommended: the establishment of a national nature conservation organisation; an overhaul of the legislation and the establishment of three national parks (Verschuren, 1976). All three proposals have since been realised.

The protected areas system comprises ten protected areas, four of which are demarcated on the ground. The system currently covers just over 3% of the country, most of which is montane habitat. Although the reserves are of national significance, they are not important on a regional scale and do not merit international aid (MacKinnon and MacKinnon, 1987). A history of conservation and establishment of protected areas is given by Kabayanda (n.d.(a), n.d.(b)) and Zimmermann (1982).

Various proposals for nature conservation have been put forward by INCN, some of which appear to have been followed up in spite of immense difficulties (Kabayanda, n.d.(b); Zimmerman, 1982). The Director of the INCN has taken seriously the need to educate the general public in environmental matters. Hence, the National Committee on the Relative Problems of the Environment was initiated in 1982 to try and make people aware of environmental degradation, and to encourage an appreciation of the need for protected areas. Proposals to improve the protected areas system, with particular reference to encouraging the tourist trade, are given by Wilson (1990). Proposals for improving the protected areas system are given by MacKinnon and MacKinnon (1986) and IUCN (1987). Importantly, these proposals do not include suggestions for extension of the protected area system, this being considered unrealistic in view of the large and expanding human population.

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Décret-loi No. 1/6 portant création de parcs nationaux et des réserves naturelles (Decree-Law No. 1/6 concerning establishment of national parks and nature reserves)

Date: 3 March 1980

Brief description: Establishes national parks and nature reserves

Administrative authority: Institut National pour l'environnement et la Conservation de la Nature (INECN) (National Institute for the Environment and Nature Conservation)

Designations:

Parc national (National park)

Reserve naturelle (Nature reserve) Regulations are the same for both categories.

Activities prohibited include: hunting; installation of populations in the proximity of a national park; exploitation of land in an area of 1,000m around a park.

Activities for which previous permission is necessary include: entry for visitors; felling of trees (which must be supervised by a forester); capture of animals or birds for scientific purposes; fishing.

The warden is responsible for protecting the quality of trees in the reserve.

No tax is payable on receipts from exploitation of national parks and nature reserves.

Boundaries may not be subject to any concessions or transfer of title, except by the State, who can modify the boundaries and area of a park or reserve. Areas thus liberated can be used for other purposes.

The state can determine the type of animals and trees to be introduced or to be destroyed in a protected area. As well as the natural flora and fauna, the organisation responsible for nature conservation can introduce in these areas new species of tree and animal in the interest of tourism or the diversification of the biotope. Special measures for flora and fauna conservation are taken by conservationists after presidential authorisation.

The legislation also uses the term "réserve naturelle intégrale" (strict nature reserve) which appears to be synonymous with "réserve naturelle".

Source: Original legislation in French

Title: Loi No. 1/02 portant Code forestier
(Law No. 1/02 concerning the Forest Code)

Date: 25 March 1989

Brief description: Provides *inter alia* for the establishment of forêts de protection (protection forests) and réserves forestiers (forest reserves)

Administrative authority: Service forestier (Forest Service)

Designations:

Réserve forestier (Forest reserve) Area where conservation is considered necessary: to maintain the soil on mountains and slopes, to prevent erosion; to

maintain the ecological equilibrium; for the benefit of populations around built up areas; for the conservation of plant and animal species recognised to be in danger of disappearance.

Area subject to a special regime determined by ministerial ordinance, concerning the management, exercise of rights of use, exploitation, and extraction of material.

Forêt de protection (Protection forest) Activities prohibited are the same as those given for forest reserves, with the addition of a prohibition of any changes to the soil which could compromise the conservation or protection of the wooded area.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Park</i>			
1	Kibira	V	37,870	1980
2	Rusizi	V	5,235	
3	Ruvubu	V	43,630	
	<i>Nature Reserve</i>			
4	Bururi Forest	VIII	1,500	



Protected Areas of Burundi

CAMEROON

Area 475,440 sq. km

Population 11.1 million (1990)

Natural Increase: 2.6% per annum

Economic Indicators

GDP: US\$ 1,496 (1988)

GNP: US\$ 1,010 (1987)

Policy and Legislation In 1973, the first unified forest law applicable for the whole territory of Cameroon was promulgated, but was subsequently replaced in 1981. The Forestry Law of 1973 was a well-balanced piece of legislation covering several points essential to modern forest utilisation, including provisions related to national park establishment, hunting and wildlife, and fisheries (Schmithüsen, 1986). Current legislation relating to the conservation of forest resources is contained in three pieces of legislation: Law No. 81-13 of 27 November 1981, Decree No. 83/169 of 12 April 1983 and Law No. 81-13 of 27 November 1981. Law No. 78/23 of 29 December 1978 concerning the protection of national parks (relative à la protection des parcs nationaux) is also relevant (DGT, n.d.).

Law No. 81-13 of 27 November 1981 laying down forestry, wildlife and fishery regulations (Loi No. 81/13 portant régime de forêts, de la faune et de la pêche) (see Annex) follows the principal lines already established by the preceding text, but is more comprehensive in particular with regard to the management of various categories of forest land, timber allocation procedure, wildlife management, hunting control and fisheries development (Schmithüsen, 1986). This law refers to: state forests; local council forests; private forests and communal forests. State forests comprise: strict nature reserves (réserves naturelles intégrales); national parks (parcs nationaux); sanctuaries (sanctuaires); game reserves (réserves de faune); production forests (forêts de production); protection forests (forêts de protection); recreation forests (forêts récréatives); forest plantations (périmètres de reboisement); zoological and botanical gardens (jardins zoologiques et botaniques) and game ranches belonging to the state (game ranches appartenant à l'Etat). It is also stated that state forests should constitute 20% of the total area of the national territory.

Definitions of protected area categories are given not in Law No. 81-13, but in two decrees passed in 1983.

Decree No. 83/169 of 12 April 1983 fixing the forest regime (Décret No. 83/169 du 12 avril 1983 fixant le régime des forêts) (see Annex) includes definitions of forest categories. These comprise: strict nature reserve; production forest; protection forest; recreation forest; reforestation area; botanical garden. This Decree also describes the procedure for the classification and declassification of forests, and exploitation of forest resources.

Definitions of protected areas concerning wildlife are given in Decree No. 83-170 of 12 April 1983 concerning the faunal regime (Décret No. 83/170 relatif au régime de la faune) (see Annex). Categories of protected area defined are strict nature reserve, faunal reserve, national park, sanctuary, zoological garden, "game ranch", buffer zone (zone tampon) and sport hunting zone (zone cynégétique). Strict nature reserves provide total protection against all human activity. Faunal reserves are areas intended to provide absolute protection for flora and fauna, with access closely controlled. However, certain activities other than hunting and fishing can be authorised by the appropriate ministry. National parks are defined as areas placed under the control of the state, the boundaries of which cannot be modified without the authorisation of the General Delegation of Tourism. They are designated for the propagation, protection, conservation and management of wildlife, or for other scientific or aesthetic values. Sanctuaries are for the protection of certain named species. Game ranches are for the exploitation of animals for food, in contrast to sport hunting zones, which allow for hunting for recreational purposes. Decree No. 83-170 further provides for the creation, extension, classification and declassification of these categories of protected area, and for the establishment of a commission responsible for giving advice on the establishment of protected areas. This decree also provides for the conditions under which hunting is permitted. Penalties for infractions against the decree are stipulated. Both decrees provide definitions of natural integral reserves. Although the wording differs, the concept of total protection remains. Decree No. 83/170 concerning the faunal regime is shorter, and refers to activities which are prohibited concerning wildlife, whereas Decree No. 83/169 concerning the forest regime refers to activities which modify the flora and land in any way (Schmithüsen, 1986).

Law No. 81/13 of 27 November 1981 and Decree No. 82/216 of 12 June 1982 also set out the responsibility of the General Delegation of Tourism (Délégation Générale du Tourisme) which (under the Decree) took over responsibility for wildlife management from the Ministry of Agriculture. Previously only national parks had come under the control of the Delegation.

According to IUCN (1989), the forest legislation needs to be revised. In particular, measures concerning production forests need to be developed. Forest legislation is reviewed by Schmithüsen (1986).

International Activities Cameroon became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 7 December 1982, under which one site was inscribed in 1987. Three sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme. Cameroon has not yet

acceded to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), but is a signatory to the 1968 (Algiers) African Convention of Nature and Natural Resources, which provides definitions of strict nature reserves, national parks and special reserves.

Administration and Management Management of protected areas is the responsibility of numerous organisations. The Department of Wildlife and Protected Areas (Direction de la Faune et des Aires Protégées), within the Ministry of Tourism (Ministère du Tourisme), is responsible for running national parks, hunting and coordinating various conservation activities. The work of this department is divided between the Wildlife and National Parks Service which is responsible for research and development of wildlife conservation and formulation and implementation of conservation policy and the Game Service which is responsible for game policy, control of hunting and supervision of protected areas.

The National Office for Forest Development (Office National de Développement des Forêts) within the Ministry of Agriculture is responsible for reforestation, environmental protection, forest inventories and development plans. Previously these matters were the responsibility of the now defunct National Office for the Regeneration of Forests (Office National de la Régénération des Forêts) and the National Centre for Forest Development (Centre National de Développement Forestier) (J. Ngog Nje, pers. comm., November 1991).

Decree No. 83/170 relative to the faunal regime (règlement au régime de la faune) provides for a commission to be established within each region of the country, responsible for advising on the creation or extension of national parks, nature reserves and game ranches, as well as for providing advice on complaints and requests for compensation from the local population. The Commission, which meets when necessary, comprises departmental representatives from six governmental departments, the police, the National Assembly and mayors of local communes. The department head or representative heads the commission. This decree also provides for the format that management plans should take.

Professionals within the Water and Forest departments are now trained at the Forest Department at the Centre Universitaire de Dschang (Cameroon) (J. Ngog Nje, pers. comm., 1991). Park wardens are usually recruited from the School for the Training of Wildlife Specialists at Garoua, Cameroon, which aims to provide trained personnel for the whole of francophone Africa. More senior staff are further educated at the Department of Forestry in the Agricultural College at Yaoundé.

Cameroon receives support from several international NGOs, as well as the FAO, UNDP, IUCN and WWF. In general, the focus is on the development of national

parks in the lowland wetter and more heavily forested areas, which have tended in the past to be less well protected (Gartlan and Agland, 1980). WWF's largest international project is in Cameroon: the development of Korup National Park (Anon., 1989). A buffer zone over twice the size of the park is being established, designed to provide a sustainable future for the 30,000 inhabitants of the region and ensure the park's survival. Support for Korup has also been provided by the Overseas Development Authority of the United Kingdom. WWF is also involved in a long term effort to establish a tri-national reserve/park system to encompass a significant block of the most important wildlife habitat in Central Africa. The three countries involved are Cameroon, the Congo, and the Central African Republic. It is envisaged that this tri-national system will consist of a mosaic of protected core areas and multiple use zones based on the Dzanga-Sangha Reserve concept in Central African Republic, adapted to the specific situations in each country. WWF has been involved in preliminary surveys of the area, which have provided the basis for a major proposal to the US-AID and the World Bank, both of which have already expressed substantial interest in funding implementation of the tri-national reserve. The African Development Bank, the European Community and other international funding agencies will also be approached. There are currently two further WWF projects in Cameroon, one of which is concerned with protecting and managing Kilum National Park, and developing a buffer zone. In 1990, WWF opened a national office in Cameroon (WWF, 1991).

Cameroon's conservation achievements place it among the leading countries of west and central Africa, but there is a need to increase the human and financial resources available for conservation to consolidate and build on these achievements.

Management problems within Waza National Park are outlined by Clement and Njoya (1983). These include: poaching, fires lit outside the park but which inevitably invade the park, transhumant pastoralism, and the subsequent introduction of disease.

A conservation group, the Association des Clubs des Amis de la Nature du Cameroun was created in 1975 (J. Ngog Nje, pers. comm., 1991).

Systems Reviews Cameroon stretches from the Gulf of Guinea to Lake Chad and encompasses a diversity of ecological zones. The coastline is 590km long and highly indented. The coastal lowlands are 100-200km wide, with their inland limit marked by slopes and steep scarps. The southern plateau is 500-800m. The Adamaoua and western high plateaux are generally over 1,000m, and bordered by dissected plateaux and steep escarpments. In the western parts of Cameroon an unbroken arc of mountainous terrain (the most extensive mountain range in West Africa) stretches southward from western Adamaoua, reaching altitudes of more than 2,000m at its highest points. This area contains many volcanic craters, crater lakes and lava flows. Mount Cameroon (4,095m)

in the south-west is a still-active volcano. Beyond the northern escarpment of the Adamoua, altitude is mostly greater than 500m. Drainage is very complex, with nine major river basins. In the far north, several small, shallow, semi-permanent lakes occur in the flood plain areas. Part of Lake Chad is situated in Cameroon (Gartlan, 1991; Hughes and Hughes, 1991; IUCN, 1983; Lamarque *et al.*, 1990; Stuart, 1986).

Natural vegetation zones grade from south to north, following the northward trend of decreasing annual rainfall and decreasing length of the dry season. Very dense Guineo-Congolian evergreen rain forest formerly covered the coastal lowlands, but has been cleared from the more densely settled areas. Areas of montane forest, described by Thomas (1986), still occur on the mountains of west Cameroon. Inland, semi-evergreen lowland forest gives way to a mosaic of lowland rain forest and secondary grassland. North of this is Sudanian woodland with *Acacia* wooded grassland in the extreme northern tip. Patches of swamp forest occur in the south of the country and along rivers on the coastal plain. Mangroves occur on the northern part of the coast to the west and east of Mount Cameroon (ARIC, 1981; IUCN, n.d.; Lamarque *et al.*, 1990).

There are no coral reefs. The fauna and flora is particularly rich and varied, with a high rate of endemism, including around 8,000 plant species (Davis *et al.*, 1986; IUCN, 1989).

The forests are threatened by the importance of the exploitation which occurs throughout virtually all forests in which exploitation is possible (IUCN, 1989). Wood is the fourth most important export after petrol, coffee and cocoa beans (IUCN, 1989). Other export crops are palm oil, rubber and cotton. Cameroon is one of a small number of African countries that has achieved self-sufficiency in food. Principal food crops comprise maize, yam, potatoes, bananas and beans.

Apart from Korup, Kimbi River and Mbi Crater reserves, all faunal reserves were created by orders (*arrêts*) of the French High Commissioner between 1931 and 1950. The first six national parks were primarily set up to attract tourists. As big game is more easily viewed within the reduced cover of the Sudanian savanna and woodland vegetation types and around watering points, the parks were all established in the north of the country. The southern Guinea savanna and forest habitats are less well represented in the protected areas system. Two small game reserves protect areas of montane grassland and forest patches including galleries in the densely populated western high plateaux region. Following realisation that the distribution of national parks was inconsistent with the principal of balanced regional development, extension of the national network from the savannas into the forest zone became a top government priority. Korup was upgraded from faunal reserve to national park status by Presidential decree in 1986 which was a major advance in enhancing the protection of forest ecosystems. Currently, 9.5% of the country within

protected areas (national parks, faunal reserves, hunting reserves and forest reserves) is officially protected. The national goal, as set by the Law of 1981, is for 20% of the land to be included within protected areas. Very little mangrove forest is protected apart from a small area in the northern part of Douala-Edea Faunal Reserve, and this is threatened with degazettement (Gartlan, 1991).

Threats to protected areas originating outside the jurisdiction of the management authorities come from local farming methods and poaching. Local farming methods are based traditionally on shifting cultivation and are eroding forested wildlife habitats and also reportedly facilitating illegal trapping and hunting. Poaching by non-locals is also reported to be a considerable problem.

The association of the Friends of Nature (Amis de la Nature) Clubs of Cameroon, initiated in 1973, is chiefly concerned with schools to train a new generation of people sensitive to environmental problems. Visits to national parks are organised for club members, and clubs have undertaken investigations into the causes of bush fires, particularly the practice of burning off vegetation for agriculture, to encourage new grass growth, or to hunt game. This was followed by a campaign amongst villagers, with films and slides, to explain the ill-effects of bush fires on soil, fauna and flora, while making it clear that some grass burning techniques can contribute to improved pasture. The club also launched an appeal to save Waza National Park, threatened by lack of water following construction of the Maga barrage. The government has since taken steps to provide the park with water by digging ponds.

The wildlife training college (Ecole de Formation de Spécialistes de la Faune) at Garoua was created in 1969 with international aid. The main objective of the college is to train students from most francophone African countries in protected area management. Despite the college's achievements to date there are a number of difficulties yet to be overcome. These include development both of staff and infrastructure, as well as achieving recognition for the diploma issued by the college (Allo and Ngog Nje, 1984).

The protected areas system is reviewed by Tsague (1986). The report outlines management problems, which include: insufficient tracks within reserves to enable viewing by the public; severe poaching; bushfires; and destruction of crops in areas adjacent to reserves by protected wildlife. Proposals for the upgrading of three faunal reserves to national park status are the focus of a report by Gartlan and Agland (1986), which also provides an overview of the protected areas system. Of the three areas discussed, Korup, Dja and Pangar Djerem, the first is the only one so far to have been gazetted as a national park.

In 1983/84 an ICBP expedition, in conjunction with the government, surveyed the montane areas to make recommendations for their conservation, none being

protected except by forest reserve status. The Bamenda Highlands were found to be particularly degraded, and one of the survey's recommendations is that a protected area should be set up on Mount Oku, north of Bamenda (Stuart, 1986).

La conservation des écosystèmes forestiers du Cameroun (Gartlan, 1989), produced as part of IUCN's Tropical Forest Programme, provides a review of forest resources, with a view to the promotion of their utilisation and rational development. Numerous recommendations concerning the forest regime are made. These include: rationalisation of the forest sector administration; more controls on forest exploitation; improvement of forest legislation; reclassification of forests according to provisions within Law No. 81-13; alteration to legislation concerning protected forest buffer zones to permit some human use; creation of categories of protected areas provided for in the legislation (sanctuaries, strict nature reserves, game ranches) or removing the categories from the legislation; provision of finance to establish personnel and equipment within protected areas; implementation of new reforestation policy; and payment of income generated by newly established national parks to the local community.

The protected areas system, with particular reference to antelope, is reviewed by Lamarque *et al.* (1991). Proposals to improve the protected areas system are given by Mackinnon and Mackinnon (1986), and then largely repeated in IUCN (1987). Proposals to improve the forest ecosystem are included in a section on Cameroon in *La conservation des écosystèmes forestiers d'Afrique centrale* (IUCN, 1989).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Law No. 81/13 portant régime des forêts, de la faune et de la pêche (laying down forestry, wildlife and fisheries regulations)

Date: 27 November 1981

Brief description: Provides definitions of state forests, local council forests, communal forests and public waterways, and further lists the categories of protected areas into which state forests are subdivided.

Administrative authority: Department of Wildlife and National Parks within the Délégation Générale du Tourisme (General Delegation of Tourism)

Designations:

Forêt Domaniale (State Forest)

Comprise:

Réserve naturelle intégrale (Strict nature reserve)

Parc national (National park)

Sanctuaire (Sanctuary) For certain wild animals or plant species

Réserve de faune (Game reserve)

Forêt de production (Production forest)

Forêt de protection (Protection forest)

Forêt récréative (Recreation forest)

Périmètre de reboisement (Forest plantation)

Jardin zoologique et botanique (Zoological and botanical garden)

Game ranches belonging to the state.

Protection of the forest estate is governed by the provisions of Law No. 80-22 of 4 July 1980 to repress infringements on landed property and state lands.

Forest reserves constituted in accordance with the statutory or administrative enactments prior to the date of this ordinance

Form part of the private property of the state and comprise at least 20% of the total area of the national territory

Forêt des collectivités publiques (Local council forest) Defined by a special enactment, together with the rules and conditions governing their exploitation.

Forêt du particuliers (Private forest) Forest produce of all kinds, with the exception of produce from trees planted by private individuals or local councils is the property of the state.

Provisions of a restrictive nature may be enacted by order of the Minister of Agriculture, in particular concerning regulations controlling bush fires, land reclamation, grazing, pasturing as well as the felling, lopping and mutilation of protected species.

Forêt du domaine nationale (Communal forest) Forests not included under the previous two categories.

Source: Original legislation in French (Schmithüsen, 1986)

Title : Decree No. 83/169 fixant le régime des forêts (fixing the forest regime)

Date: 12 April 1983

Brief description: Provides amongst other things, definitions of the protected areas listed below

Administrative authority: Direction des eaux et forêts (Département of Water and Forests) within the Ministre de l'Agriculture (Ministry of Agriculture)

Designations:

Réserve naturelle intégrale (Strict nature reserve) Area within which resources of all kinds are totally protected

Prohibited activities include: forest, agricultural, pastoral or mining of any sort; any alteration to the ground; water pollution; introduction of animal or plant species.

Unauthorised human activities of any sort liable to alter the flora in any way are strictly forbidden

Access or low-level flying for research purposes may be permitted in exceptional circumstances by the general tourism delegation, to individuals or institutions providing they are accompanied by an officer of the administration responsible for fauna.

Forêt de production (Production forest) Area principally used for timber production and other forest products

Forêt de protection (Protection forest) Area principally for the protection of the soil, water or ecosystems of scientific interest

Forêt recreative (Recreational forest)

Périmètre de reboisement (Reforestation area) Area for reforestation

Jardin botanique (Botanical garden) Site of aesthetic, scientific or cultural interest for the total protection of indigenous or introduced plants

Source: Original legislation in French

Title: Decree No. 83/170 relatif au régime de la faune (relative to the faunal regime)

Date: 12 April 1983

Brief description: Provides amongst other things, definitions of the protected areas listed below

Administrative authority:

Designations:

Réserve naturelle intégrale (Strict nature reserve) Area within which resources of all kinds are totally protected

Human activities of any sort are strictly forbidden

Access or low-level flying for research purposes may be permitted in exceptional circumstances by the general tourism delegation, to individuals or institutions providing they are accompanied by an officer of the administration responsible for fauna.

Réserve de faune (Faunal reserve) Set aside for the conservation, management and propagation of wildlife as well as for the protection and management of their habitat

In which hunting, killing or capture of animals are prohibited except by the reserve authorities or under their control

Habitation or other human activities are regulated or prohibited

Customary rights of exploitation of secondary forest products are permitted.

Parc national (National park) Area in which the conservation of fauna, flora, soil, sub-soil, atmosphere, water and environment in general poses a special interest and which it is important to preserve against natural degradation and any artificial intervention liable to alter any aspect or evolution

Factors taken into consideration include: preservation of animal or vegetable species and habitats threatened with disappearance throughout or in part of the national territory; prevention or constitution of stop-off points on wildlife migratory routes, indispensable scientific or technical studies

Prohibited activities include: hunting and fishing; industrial activities; mineral extraction; water pollution; agricultural and forestry activities; domestic animals; flying below 200m; introduction of indigenous or imported zoological or botanical species other than for scientific or management reasons

Customary rights of use not permitted.

Sanctuaire (Sanctuary) Area for the total protection of named animal or plant species, specified by the general delegate for tourism

Customary rights of exploitation of secondary forest products are permitted.

Jardin zoologique (Zoological garden) A site created and managed around built-up areas for recreational, aesthetic, scientific or cultural reasons in which wildlife is totally protected

Customary rights of use are not permitted.

Game ranch Area managed in order to increase animal populations for future exploitation as a food source

Customary rights of use are not permitted.

Zones tampon (Buffer zone) Customary rights of exploitation of secondary forest products are permitted

Area on the periphery of each national park, strict natural reserve or faunal reserve which marks the transition between these areas and areas in which sport, hunting, agriculture and other activities are freely practised

The act establishing a protected area stipulates the limits of the surrounding buffer zone

Buffer zones around national parks and natural integral reserves are subject to the conditions protecting the said reserves

Buffer zones around faunal reserves may be cultivated and inhabited by authorisation of the general delegate for tourism.

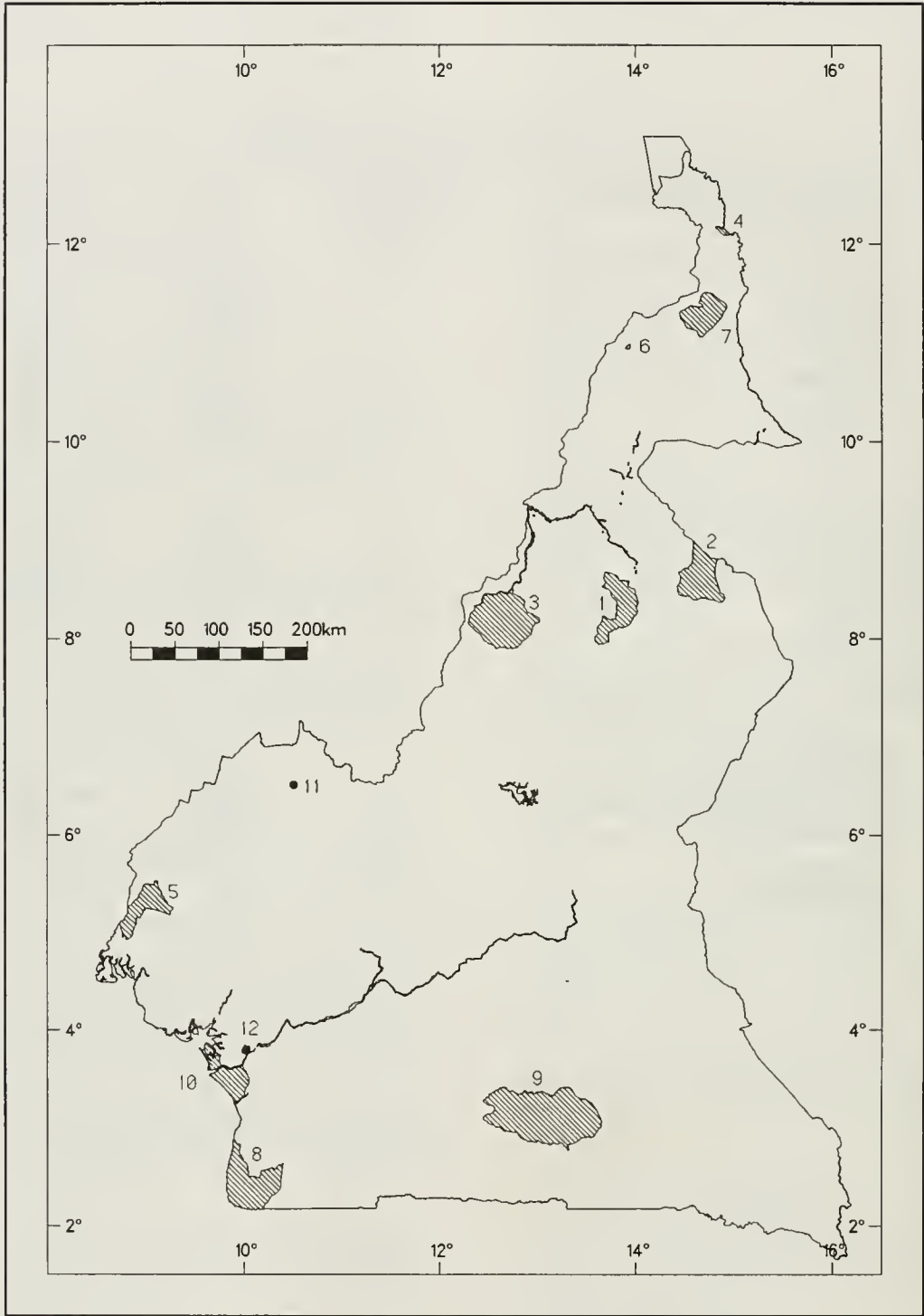
Zone cynégétique (Sport hunting zone) Hunting reserves controlled by the authorities responsible for fauna in which hunting is permitted subject to payment of a fee fixed by law

Fully protected species may not be hunted.

Source: Original legislation in French (Schmithüsen, 1986)

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>National Parks</i>				
1	Benoue	II	180,000	1968
2	Bouba Ndjidah	II	220,000	1968
3	Faro	II	330,000	1980
4	Kalamaloue	II	4,500	1972
5	Korup	II	125,900	1986
6	Mozogo-Gokoro	II	1,400	1968
7	Waza	II	170,000	1968
<i>Faunal Reserves</i>				
8	Campo	IV	300,000	1932
9	Dja	IV	526,000	1950
10	Douala-Edea	IV	160,000	1932
11	Kimbi	IV	5,625	1964
12	Lac Ossa	IV	4,000	1968
13	Santchou	IV	7,000	1933
<i>Biosphere Reserves</i>				
	Parc national de la Benoue	IX	180,000	1981
	Réserve forestière et de faune du Dja	IX	500,000	1981
	Parc national de Waza	IX	170,000	1979
<i>World Heritage Site</i>				
	Dja Faunal Reserve	X	526,000	1987



Protected Areas of Cameroon

CAPE VERDE

Area 4,030 sq. km

Population 0.4 million (1990)
Natural increase: 2.8% per annum

Economic Indicators
GNP: No information
GDP: US\$ 510 per capita (1987)

Policy and Legislation Formerly a Portuguese colony, Cape Verde was granted full independence in 1975. The Constitution, adopted on 12 February 1981, removed all reference to possible future union with Guinea-Bissau.

International Activities Cape Verde became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 28 April 1988, but to date no sites have been inscribed. The country is not party to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), nor have any sites been designated as biosphere reserves under the Unesco Man and the Biosphere Programme. Cape Verde is one of the few African countries not to have ratified the 1968 African Convention on the Conservation of Nature and Natural Resources, under which the need for protected areas is emphasised.

Administration and Management Within the Ministry of Rural Development (Ministerio do Desenvolvimento Rural), the department concerned with nature conservation is the General Directorate of Conservation of Soils, Forestry and Rural Engineering (Direcção Geral de Conservação de Solos, Florestas e Engenharia Rural). The Instituto Nacional de Investigação Agrária is considering establishing protected areas within the next few years, but these have yet to be identified (I. Gonçalves Gomes, pers. comm., 1989).

Systems Reviews Cape Verde is situated in the Atlantic Ocean 620km west-north-west of Senegal and consists of ten islands and five islets. The islands are divided into two groups: Barlavento (windward) and Sotavento (leeward). The highest point is 2,829m, on an island in the leeward group. The original vegetation is unknown and has been almost totally destroyed through over-grazing and erosion. Lowland species have tropical affinities; mountain species have Macronesian or Mediterranean affinities (Davis *et al.*, 1986). Agriculture is mostly confined to irrigated inland valleys, the chief crops being coconut, sugar-cane and maize.

To date there are no protected areas in the country. A number of regions in the Islands have been identified for consideration as protected areas as they comprise ecosystems typical of the islands or are the habitat of rare and/or endemic species (Miller, 1989). Stuart and Adams (1990) propose that a reserve should be established on the uninhabited island of Raso.

Addresses

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CENTRAL AFRICAN REPUBLIC

Area 622,980 sq. km

Population 2.9 million (1989)

Natural increase: 2.5% per annum

Economic Indicators

GNP: US\$ 390 (1988)

GDP: US\$ 480 (1987)

Policy and Legislation Apart from traditional rules and taboos concerning hunting, the fauna of the Central African Republic was first protected in 1916 under the first law concerning hunting. This law referred to 'réserves' within which hunting was an offence, although no definition of a reserve was given. The first two hunting reserves, both located in the east of the country, were gazetted for a period of 30 years in 1925, and finally declassified in 1960 (Doungoube, 1991; Spinage, 1981a).

The creation of national parks and reserves was provided for by a decree passed in 1929, but this stipulated that the establishment of such areas should not affect the economic life of the surrounding regions, and possibly confused terminology by defining national parks as strict nature reserves (réserves naturelles intégrales). The first national park was created in July 1933, prior to the London Convention which was promulgated in December of the same year, although this was only promulgated in Equatorial French Africa in May 1938. A category of partial reserve (réserve partielle) was introduced in 1935, although it was always referred to as hunting reserve (réserve de chasse). Hunting was permitted in these reserves until 1939 when, in accordance with the London Convention, it was completely forbidden, and the reserves subsequently renamed faunal reserves (réserves de faune). In 1940 national parks were also redefined (Doungoube, 1991; Spinage, 1981a).

In 1944, a new law on hunting was passed which defined strict nature reserves, national parks, partial faunal reserves and partial hunting reserves. In the 1950s a series of laws followed. A decree of 1954 brought the definitions of reserves named under the hunting laws more fully into line with the London Convention, defining strict nature reserves, national parks, protection zones and special reserves. In 1956 an order (arrêté) was passed which specified conditions of entry into natural reserves. On 3 November 1956 Law No. 56-1106 was passed covering the protection of natural monuments and sites and monuments of historic, scientific, or aesthetic value. In November 1957 a deliberation was made on procedures for classification and declassification of faunal reserves and tourist sport hunting zones. All the laws in force concerning protected areas, except No. 56-1106, were reconstituted under Law No. 60-104 concerning reorganisation of hunting zones, national parks and faunal reserves of the Central African

Republic (portant remaniement de la zone d'Intérêt Cynégétique, des parcs nationaux et réserves de faune de la République Centrafricaine) and No. 60-140 on the protection of nature (sur la protection de la nature) (modified by Ordonnance No. 66/62 of 30/8/66) (Doungoube, 1991; Spinage, 1981a, 1981b).

These laws have since been superseded by Order No. 84-045 of 27 July 1984 concerning the protection of wildlife and the practice of hunting (Annex). This provides for the protection and rational exploitation of the fauna and its natural environment, includes provisions for the delimitation of protected areas, and clarifies the current usage of previously established texts. However, in common with the legislation of other countries in the region, various omissions are evident, such as any legislation concerning the development of management plans for protected areas or the creation of peripheral zones for national parks (IUCN, n.d.).

A new type of protected area called special multiple use reserve has recently been defined. Law No. 90.017 creating Dzanga-Ndoki National Park (créant le Parc National de Dzanga-Ndoki) and Law No. 90.018 relative to the creation of special reserves (relatif à la création de la réserve spéciale) complete the list of legislation concerning the establishment of protected areas (Doungoube, n.d.; 1991).

Forest legislation is based on Law No. 61/273 of 5 February 1962 concerning creation of the Forest Code (see Annex), and some small amendments in 1962 and 1971, and by Ordonnance No. 87/037 of 24 August 1987 concerning forest taxation (relative à la taxation forestière) (IUCN, n.d.). This Code is quite representative of the first generation of laws promulgated in the French-speaking countries of West and Central Africa after independence. It is concerned, amongst other things, with the constitution of various categories of the forest estate. Detailed proposals for modification of this legislation were developed by FAO in 1977 and then prepared by the government for transmission to the Council of Ministers for approval, although there is no record of this having been given yet (Schmithüsen, 1986).

Procedures to follow for the classification and declassification of reserves are given in the Forest Code (forest reserves), and in Order No. 84.045 (other protected areas). To date, national legislation has not been passed confirming the status of biosphere reserves (Spinage, 1981a).

Several pieces of legislation provide for the administration of protected areas: Order No. 69/49 of 23 September 1969 (modified by Ordonnance No. 71/044 of 27 March 1971) which establishes the National Forest Office (Office National des Forêts), responsible for forest administration; Decree No. 70/319

of 24 November 1970 (FAO, 1978) concerning the organisation and responsibilities of the Ministry of Water and Forests, Hunting, Fishing and Tourism (portant organisation et fixant les attributions du Ministère des eaux et forêts, chasses, pêches et tourisme); Imperial Order No. 77/014 concerning the creation of the Central African Institute for the Management of Fauna (Ordonnance Impériale No. 77/014 portant création de l'Institut Centrafricain d'Aménagement de la faune) of 1 March 1977; Ordonnance No. 84. 045 (see Annex) also mentions the National Centre for the Protection and Development of Fauna (Centre National pour la Protection et l'Aménagement de la Faune) (IUCN, n.d.).

Forest legislation is reviewed in *Forest legislation in selected African countries* (Schmithüsen, 1986); a draft report on the conservation and rational utilisation of forest ecosystems in Central Africa (IUCN, n.d.), and in *La conservation des écosystèmes forestiers d'Afrique centrale* (IUCN, 1989). The latter states that the forest code is difficult to apply, and that the revised code to be produced should emphasise the rational utilisation of forest ecosystems and provide for a national forest plan based on a forest inventory. The review also outlines omissions in the Order of 1984 on the protection of fauna, in particular the absence of any reference to the development of management plans for protected areas, or the creation of buffer zones to national parks (IUCN, 1989). Legislation concerning categories of protected area other than forest reserves is reviewed by Doungoube (1991) and Spinage (1981a). Legislation concerning hunting within sport hunting zones is reviewed by Spinage (1981b).

Wildlife plays an important role in the economy and culture of the country. Informal, subsistence level hunting is a major source of nourishment, representing an estimated 30-40% of the meat consumed in the country each year (Doungoube, n.d.). Therefore, rather than prohibiting subsistence hunting, government policy concerning hunting and fauna is based on the promotion of fauna as a resource by: encouraging tourism; development of other forms of rational exploitation for the benefit of rural populations and the state; and sport hunting. By this policy, the government hopes to open up and develop marginal, little populated regions, which comprise approximately 50% of the national territory. Conscious of the importance of natural resources and the protection of the environment, the government aims to guarantee the protection of a substantial and representative part of the natural ecosystems, protect the flora and fauna and control desertification and the degradation of the land (MEFCPT, 1986).

International Activities The Central African Republic became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 22 December 1980, under which one site was inscribed in 1988. The country participates in the Unesco Man and the Biosphere (MAB) Programme by Order (Arrêté)

OUI/PG/CAB of 1 March 1977. Two sites have been designated as biosphere reserves. The Central African Republic is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). The country ratified the 1968 (Algiers) African Convention of Nature and Natural Resources in 1969, which provides definitions for strict nature reserves, national parks and special reserves. This Convention replaced the 1933 London Convention which was promulgated in Equatorial French Africa in 1938 (Spinage, 1981a).

Administration and Management The National Centre for the Protection and Management of Fauna (Centre National pour la Protection et l'Aménagement de la Faune) (CNPFAF) is the organisation technically responsible for the development and management of existing and future national parks and faunal reserves, as well as some areas within the hunting domain (Order No. 77/014). The Centre is the responsibility of the Minister responsible for Wildlife (Ministère Chargé de la Faune) within the Ministry of Water, Forests, Hunting, Fishing and Tourism (Ministère des Eaux, Forêts, Chasses, Pêches et du Tourisme) (MEFCPT). According to MEFCPT (1986), the budget for the Ministry was fixed at F CFA 10 million. The National Centre for the Protection and Management of Fauna is a self-financing organisation, the budget (F CFA 130 million) being funded by hunting and ivory taxes. Of this, 60% is spent on personnel and administrative expenses. The rest is often used to make up the lack of means of the MEFCPT. With the reduction in number of elephants, and hence of ivory taxes raised, this budget will inevitably be diminished. The MEFCPT supports 368 personnel, of which 251 are forest guards (one guard for 2,600 sq. km of territory). Eighty-five guards are allocated to land within the sport hunting zones (zones d'intérêt cynégétique), and seven to national parks. In addition, the CNPAF employs 36 patrollers who are available to aid the forestry commissioners and forest inspectorate. In practice, one guard is responsible for 1,420 sq. km in the national parks, compared to a recommended level of one person per 50 sq. km. The five-year action plan for the Ministry Water, Forests, Hunting, Fishing and Tourism is given in MEFCPT (1986). It comprises various activities: improvement in the management and control of activities in the faunal sector; protection of the environment, national parks and faunal reserves; improvement of economic returns (Doungoube, 1991; MEFCPT, 1986).

Management of the presidential park is the direct responsibility of the President (Bousquet, 1986).

Forest administration is provided for in the Forest Code, and is the responsibility of the National Forest Office (Office National des Forêts), within the Department of Water and Forests and Hunting in the Ministry of Water and Forests. When established, the National Forest Office was responsible for forests and fishing, but has subsequently had its role reduced to managing forests only (IUCN, n.d.). The Office has a primarily industrial

and commercial role. The forest code does not provide for a forest fund, the budget of the National Forest Office being provided by a proportion (40%) of the revenues from timber auctioning and temporary logging permits (Schmithüsen, 1986). The country is divided into six forest divisions or inspectorates (inspections), each of which includes a forest section (cantonnement) responsible for forest guards (Bousquet, 1986).

Little benefit has been gained from tourism associated with protected areas, which are under pressure from grazing, hunting, etc. Lack of infrastructure to accommodate tourists within national parks means the number of visitors is negligible. Realising these problems, the government has looked for assistance from FAO and UNDP in improving the situation. DOUNGOUBE (1991) outlines the strategy of the Wildlife Department (Direction de Faune) for the protection of national parks and faunal reserves and to encourage sport hunting by tourists. The strategy involves: improving access within reserves by developing a system of tracks; strategically placing surveillance posts; training park guards and guides; providing sufficient trained and equipped personnel; implementing provisions to encourage tourism; involving local people in management and developing an active policy of promoting tourism in the country.

Since 1988 WWF-US has supported a project to develop a national park and surrounding multiple-use special reserve in the Dzanga area (DOUNGOUBE, n.d.; WWF, 1991). An additional WWF project associated with the same reserve assists in funding the development of tourist facilities, in collaboration with the Union Démocratique des Femmes Centrafricaines. WWF is also involved in a long-term effort to establish a tri-national reserve/park system that will encompass a significant block of the most important wildlife habitat in Central Africa. The three countries involved are Cameroon, the Congo, and the Central African Republic. It is envisaged that this tri-national system will consist of a mosaic of protected core areas and multiple-use zones based on the Dzanga-Sangha Reserve concept (WWF Project No. 6296), adapted to the specific situations in each country. WWF has been involved in preliminary surveys of the area, which have provided the basis for a major proposal to US-AID and the World Bank, both of which have already expressed substantial interest in funding implementation of the tri-national reserve. The African Development Bank, the European Economic Community and other international funding agencies will also be approached (WWF, 1991).

Several FAO reports have been produced concerning management of wildlife in the Central African Republic, under projects FO: CAF/72/010 (final report FAO (1978)) and FO: DP/CAF/78/006.

Ngoto Forest in the south-west of the country is currently being considered as a reserve for an EC forest conservation project (Fay, 1991).

Poaching is a major problem affecting protected areas, being the main cause in the reduction of the fauna. A report on national parks in the north indicates that poaching has reached plague proportions, with 60-70% of wildlife having been exterminated between 1981-1986. Some species, including rhino, are on the verge of extinction, and others, including elephant, are in rapid decline in numbers. Until 1983, Manovo-Gounda-St Floris and Bamingui-Bangoran national parks, had four to five, and no rhinos, respectively. Until 1984, both these areas were amongst the richest in Africa in black rhinos. The creation of an area known as the Rhinoceros Sector is considered to be an error as it has attracted the attention of poachers to the territory (Bousquet, 1986; Ruggiero, 1990).

The Forest Service, with limited resources, is unable to provide effective control, given the immense areas to be covered, the length of the borders with Chad and the Sudan and the paucity of road infrastructures. The army has helped reduce poaching but is of limited use, its vehicles being restricted to roads and its helicopters audible from great distances. In addition, the cost factor means they are only of temporary use (Bousquet, 1986). In January 1989, the government declared its intention to put into action its plan for the conservation and development of wild fauna, with financial aid from the European Community (International Council for Game and Wildlife Conservation, *in litt.*). This plan includes putting back into order management organisations for national parks and faunal reserves; employing park guards to protect these areas; increasing the battle against armed Sudanian incursions and developing the use of fauna as a food source. It is intended that the plan should continue for five years.

Manovo-Gounda-St Floris National Park, a World Heritage site, has been listed by the IUCN Commission on National Parks and Protected Areas (CNPPA) since 1986 as being under threat, due to the murder of six of the guards; poaching of rhino and elephant; and invasion by nomads from Chad and Sudan with large herds of livestock carrying bovine rinderpest. Despite the presence of a project broadly financed by the EC, a management plan has not yet been produced.

Due to the lack of finance and the rapid increase in the cost of living in urban areas, and exterior pressures, the capacity of the Sector for Hunting and Fauna has suffered an almost total reduction in its ability to exercise its responsibilities. The opening of an ammunition factory at Bangui was viewed with alarm, as this could only lead to an acceleration in the process of destruction of the fauna (MEFCPT, 1986).

Systems Reviews The country is dominated by a rolling plateau, trending east-west, with two highland blocks exceeding 1,000m situated at the far eastern and western ends of the country. More than 90% of the land surface is above 500m. A watershed separating the Zaïre and Chad basins runs from west to east across the centre of the country. Drainage is predominantly by streams

flowing southwards. Along the eastern border, a triple watershed separates the Chad, Zaïre and Nile basins (Hughes and Hughes, 1991).

In general, the northern half of the country is covered in dry deciduous woodland savanna, with a small patch of undifferentiated Sudanian woodland in the extreme north corner. Within the savanna woodland zone there is a gradation from predominantly Sudanian savanna in the north to predominantly Guinean savanna in the south. The southern half of the country is a mosaic of Guineo-Congolian lowland rain forest and secondary grassland, with Guineo-Congolian semi-evergreen, lowland rain forest in the extreme south-west corner (Fay *et al.*, 1990; IUCN, 1983). The flora is poorly known. One estimate of 3,600 species is considered almost certainly too low. Of these species, *c.* 1,000 occur in the rain forest with *c.* 10 endemics, and 2,600 in the savanna with *c.* 90 endemics. The endemics are concentrated on mountain ranges in the north-east (Davis *et al.*, 1986; IUCN, 1983, 1987). The northern rivers carry gallery forests, inundated during floods. Some permanent lakes, swamps and pools occur on the central plateau along the watershed, and patches of swamp forest and inundated gallery forest exist in the headwaters of the Yata River (Hughes and Hughes, 1991).

There has been considerable forest exploitation for many years, but the south-western extremity is relatively untouched due to much of it being swamp forest. The south-eastern moist lowland forest is a considerably fragmented relict. Extensive outliers of dense forest extend well to the north of the main forest zones. Cotton, coffee and tobacco are the basic cash crops (Bissio, 1988). Much of the eastern half of the country is uninhabited and elsewhere the population is concentrated along the roadside (Fay, 1991).

In 1956, part of the country where the population density was less than 1 person/sq. km was designated as a zone d'intérêt cynégétique (sport hunting zone) to exploit the fauna, either for hunting or as national park and protection zone. The sport hunting zone outside national parks and reserves was divided into sectors with the aim of attracting tourist hunters (Spinage, 1981b). Currently, the protected areas system, comprising four national parks, one strict nature reserve, seven faunal reserves and one special reserve (but excluding sport hunting zones), covers 6,185,900ha, or approximately 10% of the country.

Proposals to improve management of forests throughout Central Africa, including proposals specific to the Central African Republic, are given in the IUCN Tropical Forest Action Programme (IUCN, 1989). These include a revision of the 1962 Forest Code to stress the importance of the conservation and national utilisation of forest ecosystems and to anticipate a national forest plan based on a forest inventory. Improvement in cooperation between the various departments of the MEFPCPT is also recommended, as well as the creation of an institution specifically for forest conservation

within this Ministry. Recommendations also include: improvement in legislation; classification as protected areas of critical sites identified in the report; prevention of forest fires; and the conservation and management of forest opened up by the new highway "Route du 4ème parallèle", and the prevention of habitation along the route. Proposals to control poaching include: horseback patrols capable of covering the same terrain as poachers; motor patrols and foot patrols and information bases in peripheral villages (Bousquet, 1986). Proposals to improve the protected areas system are also given in the *Review of the Protected Areas System in the Afrotropical Realm* (MacKinnon and MacKinnon, 1986) and the *Action Strategy for Protected Areas in the Afrotropical Realm* (IUCN, 1987).

As in many countries, poaching, especially of species for ivory but also of others, has been a particular problem. In 1982/1983 several laws were enacted, including the introduction of a ban on elephant hunting (and incidentally a moratorium on the movement of ivory in certain parts of the country). However, poaching is still severe, with interlopers on horseback from the Sudan posing a particularly serious problem as they destroy whole troops of elephants, rather than selectively killing those with mature tusks. Poachers from Chad are now using semi-automatic guns (Bousquet, 1986; Ruggiero, 1990).

In the south-west, the construction of a major highway, the 4ème parallèle, has had a large influence on the flora and fauna. Much of the road was cut through virgin forest, and has provided entry for many settlers who are practising slash-and-burn agriculture and also hunting. This has been estimated to be responsible for a several hundred-fold increase in hunting pressure in the vicinity. Plant biomass throughout the country was badly affected by a drought in the mid-1980s. Although the harmful effects of the drought are better known in the neighbouring Sahel countries, the Sahelian zone within the Central African Republic has increased, and drought poses a real threat throughout the Chari basin. Wildlife has suffered from a 1983 rinderpest epizootic which significantly reduced populations of species such as buffalo, giant eland and warthog. Pesticide poisoning of rivers has also become a serious threat (Fay, 1991; Fay *et al.*, 1990; MEFPCPT, 1986).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Loi No. 61/273 Portant création d'un Code Forestier Centrafricain (Concerning the creation of a Central African forest code)

Date: 5 February 1962

Brief description: Provides, *inter alia*, definitions of areas within the forest domain

Administrative authority: Direction des Eaux, Forêts et Chasses (Department of Water, Forests and Hunting), Ministère des Eaux, Forêts, Chasses et Pêches

Designations:

Forêt classée (Classified forest)

Forêt du domaine privée de l'état (Forest in the private state domain)

Forêt domaniale (State forest)

Réserve de faune et de flore (Faunal and floral reserve)

Réserve intégrale (Integral reserve)

Parc national (National park)

Forêts soumises (Forests which belong to collectives or public establishments)

Forêt communale (Communal forest)

Forêt rurale (Rural forest) In which collection of forest produce, for commercial or other reasons, recognised under customary rights fixed by the classifying law, is strictly personal to the title holder's family.

Cultivation and deforestation is forbidden (except within faunal reserves where exceptionally this may be allowed to provide space for building).

Prohibited activities include: grazing and trampling by domestic animals; pruning and trimming trees;

taking cutting implements of any sort outside circulation routes at night (or in the day for areas in the Sudanian zone); lighting fires along roadsides in savanna areas.

Permitted activities include: the use of traditional spears for defence; charcoal making and domestic fires (with due authorisation in controlled areas).

Except in integral reserves, forest agents are permitted to carry out necessary silvicultural or other activities concerning the fauna or flora and in exceptional cases, authorisation may be given for felling, by special decree, to enable mining research.

Within state forests and "forêts soumises", controlled exploitation is permitted, profits to go to the state or commune, as appropriate. Details concerning regulations governing the auction of wood are given.

Forêt du domaine coutumier (Forest of the customary domain) Areas in which the local communities freely exercise nonregistered customary rights

If a classified forest is declassified, it returns to the customary domain.

Bush fires are permitted during specified months.

Controls are specified for burning cleared land.

Exploitation under state control is permitted. Profits made go to the chief of the local community.

Forêt privée (Private forest) Specific private forests, including those located under land titles and those throughout which customary rights have been registered according to provisions in the land code (Code foncier).

Source: Original legislation in French

Title: Ordonnance No. 84.045 portant Code de la protection de la faune sauvage et réglementant l'exercice de la chasse en République Centrafricaine (Order concerning the protection of wild fauna and the practice of hunting in the Central African Republic)

Date: 1984

Brief description: Provides, amongst other things for definitions of strict nature reserves, national parks and faunal reserves and sport hunting zones.

Administrative authority: Direction des Eaux, Forêts et Chasses, Ministère des Eaux, Forêts, Chasses et Pêches

Designations: All areas form part of the public state domain.

Réserve naturelle intégrale (Strict nature reserve) An area in which all human presence is forbidden

Parc national (National park) An area for the protection of fauna, flora, minerals, and ecosystems of scientific or aesthetic value

Only park personnel and the public are admitted under stipulated conditions.

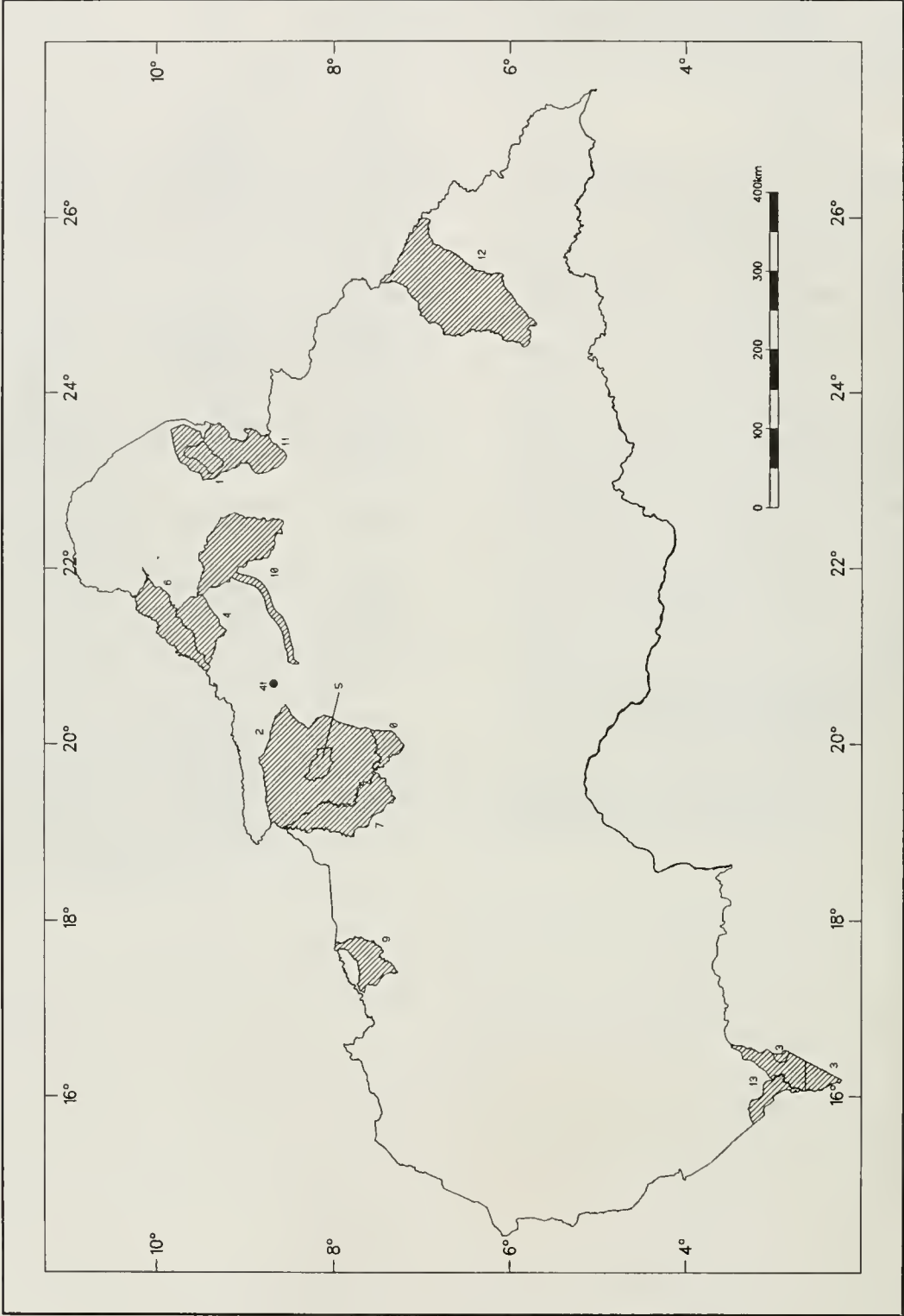
Réserve de faune (Faunal reserve) Restrictions are the same as for national parks, except that customary rights of grazing and cultivation of the land are permitted under administrative control.

Zone d'intérêt cynégétique (Hunting area)

Source: IUCN, n.d.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Andre Felix	II	170,000	1960
2	Bamingui-Bangoran	II	1,070,000	1933
3	Dzanga-Ndoki	II	122,000	1990
4	Manovo-Gounda-Saint Floris	II	1,740,000	1933
	<i>Strict Nature Reserve</i>			
5	Vassako-Bolo	I	86,000	1960
	<i>Faunal Reserves</i>			
6	Aouk-Aoukale	IV	330,000	1939
7	Gribingui-Bamingui	IV	438,000	1940
8	Koukourou-Bamingui	IV	110,000	1940
9	Nana-Barya	IV	230,000	1960
10	Ouandjia-Vakaga	IV	130,000	1925
11	Yata-Ngaya	IV	420,000	1960
12	Zemongo	IV	1,010,000	1925
	<i>Special Reserve</i>			
13	Dzanga-Sangha	VIII	335,900	1990
	<i>Private Reserve</i>			
41	Avakaba Presidential Park	VIII	250,000	1980
	<i>Biosphere Reserves</i>			
	Bamingui-Bangoran Conservation Area	IX	1,622,000	1979
	Basse-Lobaye Forest	IX	18,200	1977
	<i>World Heritage Site</i>			
	Parc National de Manovo-Gounda-St Floris	X	1,740,000	1988



Protected Areas of Central African Republic

CHAD

Area 1,270,994 sq. km

Population 5 million (1990)

Natural increase: 2.5% per annum

Economic Indicators

GDP: US\$ 216 (1987)

GNP: US\$ 160 (1988)

Policy and Legislation The Manifesto of N'Djamena of 14 August 1976 states the country's awareness of the cultural, scientific and economic importance of its natural resources and wildlife. Steps to be taken to ensure the preservation of its natural heritage include: promulgation of legislation and creation of necessary administrative organisations to ensure ecological matters are considered in all economic developments; incorporation of nature conservation and the natural environment in educational programmes at all levels; conservation and management of national parks, faunal reserves, classified forests, other natural reserves and large areas representative of the variety of natural resources; protection of flora and fauna, especially endangered species; prevention of intentional or accidental environmental degradation and pollution and maintenance of plans to promote conservation by any other means. The manifesto also states that the country relies on assistance from other countries and international organisations for help concerning nature conservation.

The first legislation providing for protected areas was passed when Chad was one of the four constituent territories of French Equatorial Africa, established under French colonial rule. Areas established prior to 1963 were set up under Decree No. 47-2254 (18 November 1947) regulating hunting in the French Overseas Territories, as modified for French Equatorial Africa by Decree No. 52-182 of 18 February 1952. The hunting law conforms to the 1938 London Convention in its provision of categories of protected area. Decree (Ordonnance) No. 14/63 of 28 March 1963 (portant réglementation de la chasse et protection de la nature) regulates hunting and the protection of nature, and provides for the designation of protected areas (Cornet d'Elzius and Gillet, 1964). Chad achieved full independence in 1960.

A Forest Code (Code forestier) was passed in 1989 (Ngaram, pers. comm) (see Annex). State forests (forêts domaniales) are classified forests which belong to the public sector of the state. Designations given are: strict nature reserve (réserve intégrale naturelle); national park (parc national); faunal reserve (réserve de faune); production forest (forêt de production); protection forest (forêt de protection); recreational forest (forêt récréative); plantation (périmètre de reboisement), reforestation area (périmètre de restauration) and botanical garden (jardin botanique). Strict nature

reserves are areas where all forms of usage are prohibited. National parks appear to differ only in that they are open to visitor access. Faunal reserves are areas where only hunting is prohibited and other traditional rights of usage continue. Procedures to follow for the classification of forests into one of these categories are given. The forest code further states that state forests should cover at least 30% of the national territory, and also that the relevant authority should establish a management plan for each forest.

Decree No. 02/PR/EEPC/PNR relates to the organisation and responsibilities of the Directorate of National Parks and Faunal Reserves.

The government adopted a master plan of action to control desertification on 4 February 1989.

International Activities Chad is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention). The country became party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) on 13 June 1990, under which one site has been inscribed. No sites have been designated as biosphere reserves under the Unesco Man and the Biosphere Programme. Chad is a signatory to the 1968 African Convention on the Conservation of Nature and Natural Resources, which provides definitions of national parks, strict nature reserves and special reserves.

The Lake Chad Basin Commission, uniting representatives of four countries bordering the lake, was established in 1964 (Anon., 1990). Chad has undertaken bilateral negotiations with both the Central African Republic and the Sudan, and drawn up draft treaties on the conservation of wildlife and natural resources and the fight against poaching in the region (DPNRF, 1987).

Administration and Management The authority responsible for conservation policy, and exploitation and protection of natural resources is the Ministry of Tourism, Water and Forests (Ministère du Tourisme, des Eaux et Forêts) (previously the Ministry of Tourism, Arts, and Natural Resources). This Ministry is also responsible specifically for both national parks and faunal reserves. Day-to-day administration of protected areas is the responsibility of the Division of Management and Conservation of Wildlife (Service de l'aménagement et conservation de la faune), a central office of the Department of Tourism, National Parks and Faunal Reserves (Direction du Tourisme, des Parcs Nationaux et Réserves de Faune). At the regional level there are six national parks and faunal reserves sectors (secteurs des parcs nationaux et réserves de faune), each of which is divided into 12 surveillance blocks. Park wardens are recruited from local people who are

generally well versed in knowledge of the wildlife (DTPNRF, 1987).

The Division of Forests, Hunting and Anti-poaching is responsible both for control of hunting outside protected areas, and for protection and management of forests.

Government conservation objectives include reinforcing the national parks administration to enable it to protect wildlife and in particular fight against poaching. To achieve these aims the administration needs to provide well-trained and equipped park guards. Main tasks involve: protection against bush fires, pastoralists and cultivators; rigorous application of regulations concerning the ivory trade; public awareness programmes to increase understanding of the fauna; development of a national policy for the protection and management of fauna, by the creation of a national committee for nature protection and the prevention of poaching (DPNRF, 1987).

The report produced following a visit to Chad by IUCN members, contains optimistic comments concerning the future of the country's fauna, despite the serious pressures under which the fauna has been placed (Sournia, 1985). The country planned to launch a national conservation strategy in 1990, with the assistance of IUCN. The EC is financing an important project for the rehabilitation of Zakouma National Park and envisages financing a regional project which includes the Central African Republic (Daboulaye and Thomassey, 1990).

In general, there appears to be a firm commitment to nature conservation at all levels, with renewed management efforts within some protected areas, and an increase in anti-poaching activity. Hunting safaris, once a major reason for the reduction of wildlife particularly in the north of the country, are no longer listed as a significant factor. As in many developing countries, however, there has been an unfortunate lack of both equipment and personnel, hence management of protected areas has not been effective. Cornet d'Elzuis and Gillet (1964) referred to the severe shortage of personnel, a problem which is still current (Daboulaye and Thomassey, 1990; Sournia, 1985).

Systems Reviews Chad is a roughly rectangular, land-locked country, south of Libya, east of the Sudan, north of the Central African Republic and east of Cameroon, Nigeria and Niger. The northern third of the country forms part of the Sahara Desert, with the great Tibesti volcanic massif which reaches 3,415m. South of this massif is a vast sedimentary basin, lying between 250m and 500m. The south part of this basin forms the Oubangui Plateau in the Central African Republic, and the Adamoua and Mandara Mountains of north Cameroon and north-east Nigeria. The Sahel region in the centre of the country stretches west to the banks of Lake Chad, the fourth largest lake in Africa, which drains over 90% of the country (Hughes and Hughes, 1991; MTE, 1991). Over the last 30 years, drought and

desertification have whittled the formerly 28,000 sq. km lake down to 10,000 sq. km, the volume of water being reduced by 60% (Anon., 1990). The lake, half of which lies within Chadian borders (the rest being within Niger and Nigeria), is shallow and mostly covered with swamps. Thought to be the remnant of an ancient inland sea, its waters are fed by the rivers Chari and Longoni. In the north the River Batha temporarily flows following rain, and feeds Lake Fitri, a permanent lake of approximately 50,000ha in the Sahel (MTE, 1991).

In the south, vegetation is largely undifferentiated Sudanian woodland, interspersed with patches of edaphic grassland and communities of *Acacia* and broad-leaved trees. Further north a Sahelian transition zone gives way to desert vegetation of regs, hamadas and wadis. The northern third of the country is absolute desert with islands of Saharo-montane vegetation on the Tibesti mountains. These islands are floristically rich, and unrelated to the surrounding lowlands (Davis *et al.*, 1986; IUCN, 1983). Chad still has a moderately rich Central African Sudanian woodland fauna, although with very few endemic species, there being no endemic mammals, birds, or amphibians. The Sahelo-Saharan zone to the north is potentially very important for the conservation of several highly threatened ungulates (IUCN, 1989).

The richest agricultural lands, which are also the most densely populated, occur along river banks in the south of the country. Cotton is the main export product, but subsistence agriculture predominates although seriously hampered by droughts. Transhumant pastoralism is practised in the central transition zone (Bissio, 1988).

Protected areas were largely established during the 1950s and 1960s. The two national parks and seven faunal reserves cover just over 9% of the country and are mostly located in the south. Ouadi Rime-Ouadi Achim Faunal Reserve (8,000,000ha) is the largest reserve in Africa. Situated centrally in the northern Sahel transition zone, it occupies over 6% of the country. There are large gaps in the protected areas system, however, with adequate representation for only semi-desert grassland and undifferentiated woodland. Very little remains of the *Isobertinia*-dominated woodland and swamps, and it is not covered in the protected areas network. Reserves in Chad are significant internationally in so far as possibly the last viable populations in the world of scimitar horned oryx exist in the country, in Ouadi Rime-Ouadi Achim Faunal Reserve. The reserve may also have globally significant populations of addax *Addax nasomaculatus* and dama gazelle *Gazella dama*. Exact data are not available, however, as the reserve has been off-limits for years due to the war and remaining threats from land mines (C. Magin, pers. comm., 1991).

Over the last two decades desertification, continual fighting, and poaching have caused problems throughout the country. Chad has probably been more affected by the long period of desertification than any other Sahelian country. The war which has raged throughout the

country for more than two decades has had serious repercussions on wildlife in general, and elephants in particular. Elephants are threatened by poaching for both their meat and their ivory, poaching for ivory being the main cause for the drop in the elephant population between 1970 and 1983. Poaching for meat is considered to be particularly unjustified as the country is self-sufficient in cattle. Bushfires pose a further hazard to both flora and fauna (Daboulaye and Thomassey, 1990; Djambo and Djime, 1983; Sourmia, 1990).

Although not exploited economically, all classified forests, national parks and faunal reserves have been subject to human and animal pressure over recent years. All forests in the south of the country have been subject to heavy human population pressure due to movement of the population from the north to the south (MTE, 1990). Proposals to improve protection for elephants are given by Daboulaye and Thomassey (1990). These include equipping game wardens to counter the poachers and traffickers; monitoring the seasonal movements of the main elephant herds in order to set up an efficient system for their protection during these movements and finally strengthening regional cooperation. A report by Newby (1984), although focusing on Niger, refers in general to the value of protected areas in the Sahel and hence is relevant to Mali. The protected areas network in the Sahel is also reviewed in IUCN (1989).

Recommendations for action to improve the management of protected areas and for other conservation measures are also given by MacKinnon and MacKinnon (1986), and in IUCN (1987, 1989).

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ANNEX

Definitions of protected area designations, as legislated,
together with authorities responsible for their administration

Title: Code forestier

Date: 1989

Brief description: Provides, amongst other things, definitions of categories below

Administrative authority: Ministère du Tourisme, des Eaux et Forêts (Ministry of Tourism, Water and Forests)

Designations:

Réserve naturelle intégrale (Strict nature reserve)
Strictly protected area, prohibited activities include: hunting and fishing; forest, mining or agricultural activities; alteration to the ground or flora of any sort; introduction of local or imported, wild or domestic animal species.

Customary rights of use are not permitted.

Entry, circulation and flying below 200m is strictly prohibited other than by: agents responsible for the reserve; special authorisation from the relevant Minister (such authority is only given for scientific reasons, with minimal specimen collection being permitted).

Parc national (National park) For the propagation and protection of wild fauna and flora, the conservation of objects of aesthetic, geological or scientific interest, and for public education and recreation.

The wildlife management authorities may undertake necessary activities for scientific, educational and touristic reasons.

Visiting is allowed by permit.

Réserve spéciale (Special reserve) Reserves of a scientific, touristic, climatic character or for natural resources for hydroelectric energy.

Réserve de faune (Faunal reserve) Hunting is strictly prohibited except in legitimate cases of self defence.

Fishing, grazing, and collection of honey, wax and wild fruit is permitted to those with customary rights.

Flying below 200m is prohibited.

Fôret de production (Production forest)
Principally for the production of timber and other forest products.

Forêt de protection (Protection forest)
Principally for the protection of the soil, water systems and ecosystems of scientific interest.

Forêt récréative (Recreational forest) To create or maintain areas for leisure, for aesthetic, artistic, sport or health reasons.

Périmètre de reboisement (Plantation)
Insufficiently wooded areas for artificial regeneration.

Périmètre de restauration (Reforestation area)
Area insufficiently wooded and which it has been decided to plant with forest species in order to: prevent erosion; maintain water supplies; promote public health or maintain the biological equilibrium.

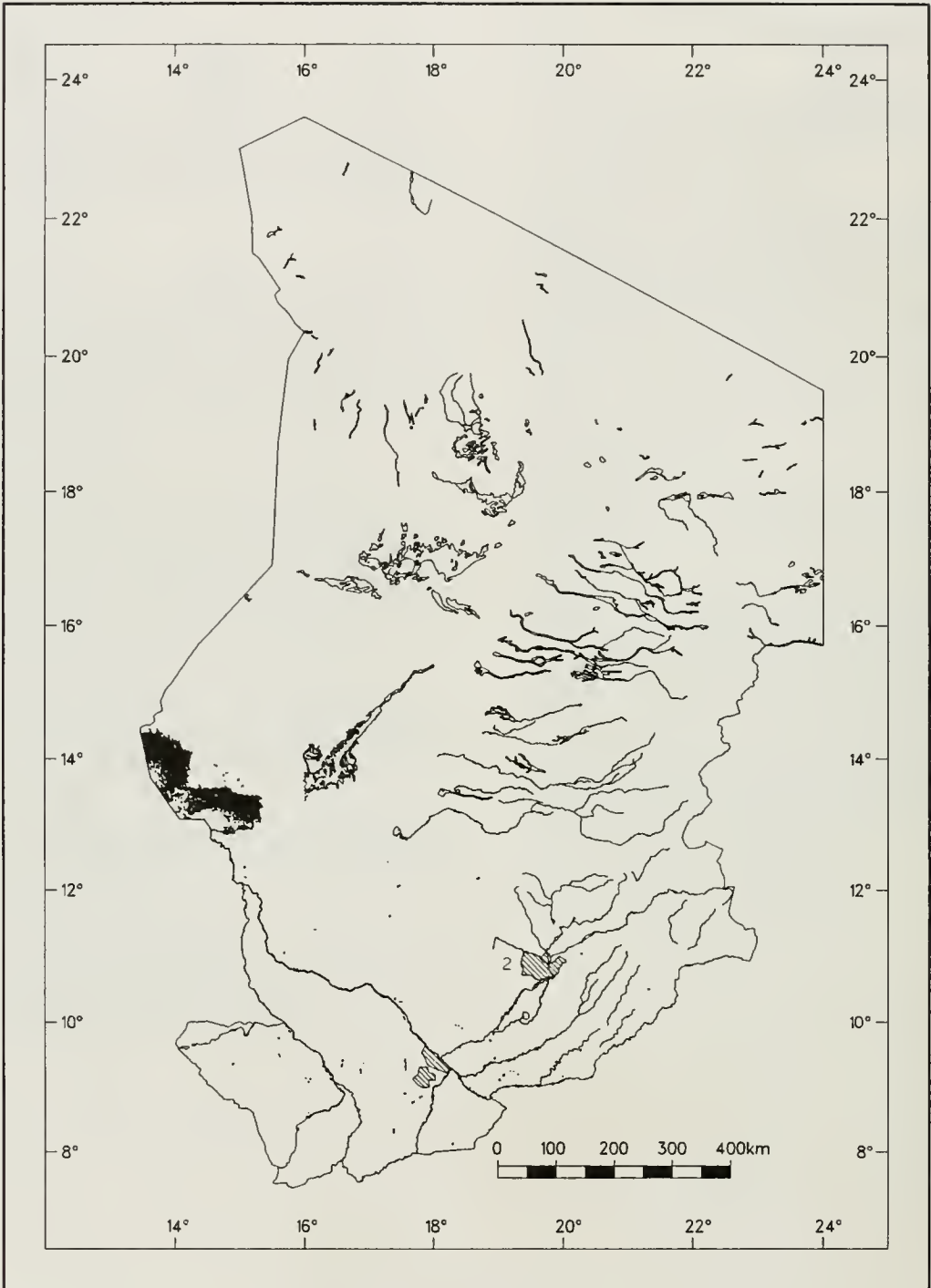
Areas insufficiently covered in vegetation, which have been protected in order to allow natural regeneration to ensure protection from erosion, to maintain water sources, protect public health and maintain a regions biological equilibrium.

Jardin botanique (Botanical garden)

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS OF CHAD

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Manda	II	114,000	1969
2	Zakouma	II	300,000	1963
	<i>Other area</i>			
8	Massagnet Sylvo-Pastoral Reserve	VIII	140,000	1974
	<i>Ramsar wetland</i>			
	Réserve de la biosphère du Lac Fitri	R	195,000	1990



Protected Areas of Chad

COMOROS

Area 2,230 sq. km

Population 0.5 million (1990)
Natural increase: 3.4% per annum

Economic Indicators

GDP: US\$ 433 per annum (1987)
GNP: US\$ 440 per annum (1988)

Policy and Legislation The Federal Islamic Republic of the Comoros Islands comprises three main islands. A fourth island, Mayotte, comes under French legislation, and has the right to join the republic when it chooses. The Comoros has no legislation with respect to reserves, or for their management.

International Activities The Comoros are not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) nor to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), neither are any sites listed under the Unesco Man and the Biosphere Programme. It is a signatory to the 1968 (Algiers) African Convention of Nature and Natural Resources.

Administration and Management All environmental problems are coordinated by the Ministry of Equipment, Environment and Urbanisation (Ministère de l'Équipement, de l'Environnement et de l'Urbanisme). The Ministry of Production, Industry and Craft (Ministère de la Production, de l'Industrie et de l'Artisanat) is responsible for agriculture, forestry, fisheries, fauna and flora these being under the direct control of a Central Federal Directorate for Rural Development. The Forestry Department, within the Ministry of Production, Industry and Craft is responsible for revegetation and erosion. Exotic species of plant are used due to their rapid growth when compared to native species (Noman, 1983). The Fisheries Department is managed in conjunction with the Society for Development of Fishing in Comoros, which intends to create three marine parks.

Systems Reviews The Comoros rise as isolated seamounts of volcanic origin at the northern end of the Mozambique channel. The republic consists of three major islands (Grand Comore, Anjouan and Mohéli), about 40-60km apart, which, although of tiny land surface are of great strategic importance. The islands are relatively young, of volcanic origin, with Grand Comore having an active volcano of 2,361m. Relief in general is steep and undulating, with shores composed mainly of black volcanic rock, with numerous coves of white sand. Of the three islands, Mohéli, the smallest, is least degraded and Grand Comore, the largest and most densely populated, is most degraded. Fringing coral reefs occur round all three islands (Dufresne, 1989; IUCN, 1988).

The native lowland plants are almost completely destroyed on all three islands. Very little intact upland forest remains on Anjouan, however, there is considerable forest on upper slopes of Grand Comore and Mohéli, but much of this is badly degraded (IUCN, 1986; Tattersall, 1977). Mayotte is relatively unpolluted, but erosion is a serious problem (Anon., 1991). Mangroves are found in small areas on Mohéli, and are relatively undisturbed due to the influx of terrestrial sediment from the hillsides (IUCN/UNEP, 1988)

Apart from some subsistence farming and fishing, the economy of the islands has depended to a large degree on the export of specialised agricultural crops. There is no large commercial fishery and the artisanal fishery is insufficient to meet the needs of the population. Exploitation is intense, partly due to the limited area of shallow water. Only 37% of the cultivated land is used to grow cash crops: vanilla; cloves and ylang ylang *Cananga odorata* (an important perfume species), the rest being devoted to subsistence farming (Bissio, 1988; Griffin, 1986). Demands for use of natural resources are rapidly expanding and although areas to be protected have been identified, the government lacks the finance and technical expertise to establish these sites or ascertain priorities (Noman, 1983).

No legally gazetted protected areas have yet been established, although national monuments, respected by the local population do exist (Noman, 1983). The government intends to create four marine reserves. These comprise a marine park at Mohéli on the island of Nioumachoua (5ha) with the status of strict nature reserve with fishing prohibited and only opened to scientists, surrounded by a buffer zone where artisanal fishing is permitted. Marine areas are proposed between Bangoi Kouni and Ivoini, and Chindini and Malé (in the north and south of Grand Comore respectively); and Chirononi on Anjouan. The volcano of Karthala on Grand Comore (5,000ha) has also been suggested for protection by the government (Noman, 1983). These proposals are repeated as recommendations by MacKinnon and MacKinnon (1986) and again in IUCN (1987). Frazier (1985) recommends the creation of a reserve system for the beaches and reefs of Chissioua Ouénéfou, off the south of Mohéli, which would include three of the six major turtle nesting beaches in the Comoros and some of the richest reefs.

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PEOPLE'S REPUBLIC OF THE CONGO

Area 342,000 sq. km

Population 2.2 million (1990)

Natural increase: 3% per annum

Economic Indicators

GDP: US\$ 1,171 (1987)

GNP: US\$ 930 (1988)

Policy and Legislation The first protected area in the Congo, Parc national d'Odzala, was established in 1935 after the country became a signatory to the 1933 London Convention (MEF, 1983), while it was under the administration of French Equatorial Africa.

In 1974 a major change was made to the forest legislation. A new forestry code was adopted by Law No. 004/74 which replaced the whole of the previous texts which had become dispersed and obsolete. A partial revision of the new forestry code was made in 1982 by Law No. 32/82 (see Annex), the legislation currently in force with respect to the forest domain. This maintains the long standing distinction between protected forests (forêts protégées), which are those subject to general protective restrictions, and classified forests (forêts classées) which are subject to a formal act of classification. Definitions are given for: production forests (forêts de production); protection forests (forêts de protection) and community development forests (forêts de développement communautaire). Protection forests are further subdivided into national parks, strict nature reserves, nature reserves and reforestation areas. The law details activities prohibited throughout the forest domain. These include damage to certain named species of tree (listed by decree of the Minister for Water and Forests) or any tree whose fruit or nuts are nutritionally important for wild fauna. Regulations concerning the lighting of fires are also given. Penalties for infractions against the law include fines and prison sentences of up to two years. This law also gives detailed provisions for the classification of forests, by decree of the Prime Minister.

Legislation providing for other categories does not exist. Currently, certain titles, for example faunal reserve (réserve de faune) or hunting area (domaine de chasse), are used despite the legislation which originally provided for them having been repealed. National legislation providing for biosphere reserves has never been passed, although two are listed (IUCN, 1989).

A draft law on wildlife management and protection was prepared in 1981 (IUCN, n.d.; Schmithüsen, 1986). The management of wildlife is provided for under Law No. 7/62 of 20 January 1962 regulating the exploitation and protection of wildlife (portant réglementation en matière d'exploitation et de protection de la faune) and under Law No. 48/83 of 21 April 1983 defining conditions for the conservation and exploitation of

wildlife (définissant les conditions de la conservation et de l'exploitation de la faune sauvage) (P. Hecketsweiler, pers.comm., 1991).

Administration of the forest domain is provided for by Decree No. 82/213 of 7 February 1982 concerning attributions and organisation of the Ministry of Water and Forests (Décret No. 82/213 du 7 février 1982 portant attribution et organisation du Ministère des Eaux et Forêts). The forest legislation is reviewed by Schmithüsen (1986) and in IUCN (1989, n.d.).

International Activities The Congo ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 10 December 1987, although to date no sites have been inscribed. Two sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme. The country does not participate in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), but has ratified the 1968 (Algiers) African Convention of Nature and Natural Resources, in which definitions of strict nature reserves, national parks and special reserves are given.

Administration and Management Numerous national organisations are responsible for nature conservation, but lack of a clear management structure means that they are not as effective as they could be (IUCN, 1989). All problems relating to wildlife and conservation are the responsibility of the Ministry of Water and Forests. The Ministry, under the control of the Minister of Water and Forests, comprises the cabinet, an administrative department, secretary general and controls five departments, including the Department of Water and Forests (Direction des Eaux et Forêts) and the Department of Hunting, Fishing and Fish Farming (Direction des Chasses, Pêche et Pisciculture). The Department of Water and Forests' responsibilities include: developing policies concerning forest management; applying forest management regulations; developing the politics of forest planning and establishing programmes for forest inventories. The Department of Hunting, Fishing and Fish Farming's responsibilities include developing policies for managing the fauna and nature conservation and implementing hunting regulations. The department comprises a Section for Hunting and Protection of Fauna (Service des Chasses et de la Protection de la Faune) and Section for Fish Farming and Continental Fishing (Service de Pisciculture et de Pêche Continentale). Regional departments for Water and Forests are directly responsible for the execution of laws and regulations within each region.

WWF is involved in a long-term effort to establish a tri-national reserve/park system that will encompass a

significant block of the most important wildlife habitat in Central Africa. The three countries involved are Cameroon, the Congo, and the Central African Republic. It is envisaged that this tri-national system will consist of a mosaic of protected core areas and multiple use zones based on the Dzanga-Sangha Reserve concept in CAR (WWF Project 6296), adapted to the specific situations in each country. WWF has been involved in preliminary surveys of the area, which have provided the basis for a major proposal to the US-AID and the World Bank, both of which have already expressed substantial interest in funding implementation of the tri-national reserve. The African Development Bank, the European Economic Community and other international funding agencies will also be approached (WWF, 1991).

Although adequate legislation exists for the management of protected areas, in effect control is virtually non-existent due to lack of financial support, and poaching is commonplace (Fay and Agnagna, 1991; IUCN, 1989; Mankarika, 1981; Verschuren, 1982, 1984).

Systems Reviews The Congo has an Atlantic coast of 190km with coastal lagoons separated from the sea. A sandy coastal plain stretches about 160km inland, rising into low hills which increase in size to form a chain of mountains. These cross the country from south-east to north-west, reaching 930m at Mount Founonati. A high area further inland, the Massif du Chaillu, is separated from this chain by a lower plain. Beyond the massif, a series of plateaux, between 500-650m, extends northward to the Gabonese border. In the east, the border with Zaïre is formed by the Congo (Zaïre) and Oubangui rivers. In the northern sector, the land slopes from west to east into the central depression of the Zaïre Basin (Hughes and Hughes, 1991; Moguedet, 1980).

The country is mostly covered by evergreen and semi-evergreen lowland rain forest, interspersed with secondary grassland savanna. A large area of swamp forest occurs in the Congo Basin in the north-east (IUCN, 1983). The coastal plain is covered in bushy savanna. Mangroves are not extensive, forming a thin band which reaches a maximum width of around 10m along the coastal estuaries, and forming a single row around coastal lagoons (Moguedet, 1980). Throughout the Congo the preponderant factor determining vegetation type is the geological nature of the underlying soil. The flora is poorly known with insufficient evidence for assessment of endemism, although it is considered likely to be comparable with Gabon (Davis *et al.*, 1986).

Large areas of forest, covering about 62% of the country, still remain (IUCN, 1989), representing approximately 9.9% of the dense forest on the African continent. The savanna and much of the rain forest is disturbed, although the northern block of forest is one of the least disturbed in Africa. There is virtually no savanna fauna, and the forest fauna is seriously threatened (Verschuren, 1984). Cultivated and fallow land covers approximately

2.8% of the country. Cassava, plantain, root crops and peanuts are the main food crops grown. Coffee, cocoa and tobacco form the main export crops.

Parc national d'Odzala, established in 1935, was the first protected area. By 1982, 3.9% of the country (1,339,000ha) was established as protected areas, although in effect these exist only on paper, protection being virtually non-existent (Verschuren, 1982). Samples of all vegetation types except swamp forest are included within these reserves.

A brief review of the protected areas is given by Spinage (1980). In a comprehensive review of the fauna, flora and nature reserves in the Congo, Verschuren (1982) gives detailed short and long-term proposals to improve the protected areas system. These include revision and enforcement of legislation concerning protected areas and establishing agents of the hunting service as officers of the Judiciary police. Immediate action is recommended to confiscate weapons, impose a high taxation on cartridges, limit hunting of certain species to six months a year and to prohibit totally the hunting of elephants. The creation of more large national parks in the north of the country, frontier parks with the Central African Republic and Gabon and buffer zones around the parks is recommended. Specific proposals to ensure the effective management of existing reserves are made, as well as for the provision of uniforms, weapons, vehicles and adequate training for park guards. Finally, the necessity for a good publicity and information campaign on the importance of conserving the country's natural resources, and of establishing relations with international organisation and neighbouring countries is emphasised.

Detailed recommendations are also given in IUCN (1990). These include creation of an institution responsible for the management of protected areas, the "Institut Congolais pour la Conservation de la Nature", the passing of legislation for nature conservation and the adaptation of forest legislation to the conservation and national utilisation of forest ecosystems. They recommend adaptation of the schedule detailing conditions under which forest exploitation is permitted, according to conservation objectives, to classify reforestation areas as reserves to act as wildlife refuges. Details are given of six additional proposed sites. Also proposed are: alterations to the legislation and institutions responsible for management of protected areas; the utilisation and conservation of forest ecosystems; and development of activities which will attract international finance. Proposals to improve the protected areas system are reviewed by MacKinnon and MacKinnon (1986), these proposals being repeated in IUCN (1987).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No. 32/82 portant modification de la Loi No. 004/74 du 4 janvier 1974 portant code forestier (Law No. 32/82 concerning modification of Law No. 004/74 of 4 January 1974 concerning the forest code)

Date: 7 July 1982

Brief description: Provides for the designation of land within the forest domain

Administrative authority: Ministère des Eaux et Forêts (Ministry of Water and Forests)

Designations:

Forêt de production (Production forest)
Classified forests, set aside for wood production, subject to permits and contracts provided by the present law, and in which exercise of customary rights may be permitted by the Minister of Water and Forests.

Forêt de protection (Protection forest) Classified forests, for the conservation or restoration of flora, fauna, soil or water systems and exercise of customary rights, in which permits and contracts for forest exploitation, rights of residence or access can be removed if necessary.

Parc national (National park) Areas of tourist, scientific or historic interest in which permanent residence is not permitted. Only activities necessary for the conservation or restoration of the reserve are allowed, and public access may be prohibited.

Rights of use are not permitted.

Réserve naturelle (Nature reserve) Area of tourist, scientific or historic interest, established for general or special reasons, for the protection of one or more species of fauna or flora. Reserves created for the conservation of forest species are directly managed by the Ministry of Water and Forests.

The Minister for Water and Forests regulates activities and rights of residence in order to conserve or restore the reserve.

Public rights of access may be prohibited.

Réserve naturelle intégrale (Strict nature reserve)
Areas protected as much as possible from all human influence, with access permitted only to wardens responsible for surveillance.

Périmètre de reboisement (Reforestation area)
Treeless or sparsely wooded land for which reforestation is considered necessary to maintain soil on slopes, to prevent erosion by water; to stabilise maritime dunes and prevent erosion by the sea; to maintain water sources, for public health; for military defence; for economic or social projects.

Rights of use are not permitted.

Introduction of livestock or cultivation after clearing and incinerating vegetation is prohibited.

Forêt de développement communautaire (Community development forest) Classified forest, allocated to the subsistence of resident populations.

Maintenance of forest species necessary to the human population is the responsibility of the Ministry of Water and Forests.

Forest clearing only permitted if an equivalent area is first reafforested.

Forêt protégée (Protected forest) Unclassified forest, incorporated by arrêté (order) of the Ministry responsible for Water and Forests, which delimits exactly their extent without prejudice to rights following from definite concessions.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Park</i>			
1	Odzala	II	126,600	1940
	<i>Faunal Reserves</i>			
2	Conkouati	IV	300,000	1980
3	Lefini	IV	630,000	1951
4	Lekoli-Pandaka	IV	68,200	1955
5	Mont Fouari	IV	15,600	1958
6	Nyanga Nord	IV	7,700	1958
7	Tsoulou	IV	30,000	1963
	<i>Hunting Reserves</i>			
8	M'boko	IV	90,000	1955
9	Mont Mavoumbou	IV	42,000	1955
10	Nyanga Sud	IV	23,000	1958
	<i>Biosphere Reserves</i>			
	Réserve de la biosphère de Dimonika	IX	62,000	1988
	Parc national d'Odzala	IX	110,000	1977



Protected Areas of Congo

CÔTE D'IVOIRE

Area 322,460 sq. km

Population 12.1 million (1989)

Natural increase: 3.6% per annum

Economic Indicators

GNP: US\$ 750 per annum (1988)

GDP: US\$ 912 per annum (1987)

Policy and Legislation From 1899 to 1960 Côte d'Ivoire was a French colony, which, together with the present day territories of Benin, Burkina Faso, Niger and Mali, formed part of the country of French West Africa. Under French colonial law, the decree of 10 March 1925, "fixing certain conditions concerning hunting regulations and the institution of refuge parks in French West Africa" (arrêté "fixant certaines conditions d'exécution portant réglementation de la chasse et instituant des Parcs de Refuge en Afrique Occidentale Française") providing for the establishment of refuge parks, was the first piece of legislation providing for protected areas in the region.

The pieces of legislation currently providing for protected areas are Decree No. 66-433 of 15 September 1966 and Decree No. 65-425 of 20 December 1965, the Forest Code (see Annex). Decree No. 66-433 of 15 September 1966 establishes the status of strict or partial nature reserves, national parks and faunal reserves and regulates procedures for their classification and declassification.

The Forest Code follows, to a considerable extent, the format of the basic forest legislation that has existed in several francophone countries of West and Central Africa since independence. It defines forests, protection areas and reforestation zones, as well as the various categories of tenure that may exist within the forest domain. It is also concerned with the constitution of reserved and protected forests, the exercise of customary rights and the granting of timber harvesting rights in forests under state control. An important adjustment of the forest reservation concept, as determined in the Forestry Ordinance, to the country's profoundly changed land-use pattern, is made by Decree No. 78-231 (see Annex). This distinguishes between two principal categories of the forest domain: the permanent forest domain of the state (or classified state forest reserves), and the rural forest domain of the state. The permanent forest domain serves for long-term wood production and the maintenance of an ecological equilibrium. The rural forestry domain provides a land reserve for the expansion of agriculture. Procedures for classifying and declassifying state-owned forests are given in Decree No. 66-428 of 15 September 1966, establishing the procedures for classification and declassification of state-owned forests (Décret No. 66-428 fixant les procédures de classement et de déclassement des forêts domaniales) (Schmithüsen, 1986).

Decree No. 66-433 (see Annex) also gives procedures for classification and declassification of strict and partial nature reserves as well as national parks. Décret No. 74-179 of 25 April 1974 classifies Iles Ahotiles National Historical Park, and places it under the Ministry of National Education (Ministère de l'Education Nationale) (Djédjé Bagno, 1990).

Legislation providing for the management of protected areas is given in Decree No. 78-231, which presents important provisions on the management and utilisation of the forest domain, and Decree No. 81-735 determining the responsibilities and organisation of the Ministry of Forestry, and regulations concerning the establishment of the field services of the Ministry (Schmithüsen, 1986).

Forest legislation is reviewed by Schmithüsen (1986).

International Activities Côte d'Ivoire became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 9 January 1981, under which three sites are inscribed. Two sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere Programme. Côte d'Ivoire is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), but has ratified the 1968 (Algiers) African Convention of Nature and Natural Resources which provides definitions of strict nature reserves, national parks and special reserves.

Côte d'Ivoire has established a cooperative commission with Liberia concerned with nature conservation and natural resources, to coordinate forest and hunting regulations of the two states.

Administration and Management The Ministry of Water and Forests (Ministère des Eaux et Forêts) is responsible for all protected areas. Classified forests, both exploited and unexploited, are under the direct control of this Ministry, whereas national parks, faunal and floral reserves and all natural reserves except classified forests are the immediate responsibility of the National Parks State Secretariat (Secrétariat d'Etat aux Parcs Nationaux), which itself is the responsibility of the Ministry of Water and Forests (Djédjé Bagno, 1990). Personnel within the National Parks State Secretariat total 617. Only 180, however, are effectively concerned with the surveillance and management of national parks and reserves. Djédjé Bagno (1990) considers that this figure should be tripled in order to provide even minimal protection. Comoë and Azagny national parks, which are open to tourism and have protective and administrative infrastructures, are moderately well protected. Marahoué National Park also has some protective and administrative infrastructure but has low levels of protection and management. The levels of protection and

management in the other parks and reserves varies from nil to low (Roth and Hoppe-Dominik, 1990).

Proposals exist for a Park Guard Training Centre, and to ensure that guards are adequately equipped, in particular with CB handsets, a light aircraft and sufficient ground vehicles. Infrastructure being created under the National Parks Inspectorate, to ensure adequate protection, includes surveillance posts and guard rooms at the edge of each park and reserve. Particular stress is given to the need to educate the population of the importance of protected areas. To this end, specific objectives include: production of a 30-minute, 16mm- colour film concerning national parks and nature protection and the production of a series of slides depicting the animals of Côte d'Ivoire; production of posters aimed primarily at schools showing native animals, in particular endangered species; organisation of radio quizzes on nature protection, with visits to national parks as prizes; organisation of conferences, and sport competitions with prizes and training of youth clubs. The need to educate all ages, both from urban and rural communities, is stressed (Djédjé Bagnou, 1990).

There are currently two WWF projects running in the country. One is concerned with the management of Taï National Park, the second involves a local non-governmental conservation organisation, La Croix Verte. This is the leading conservation organisation dedicated to environmental protection, conservation education, wildlife preservation and the sustainable use of natural resources (WWF, 1991).

Basically, national parks are subject to two threats: poaching and gold prospecting. Other regular threats are posed by forest exploitation and cultivation of the land by local villagers (IUCN, 1983). Since 1984, the IUCN Commission on National Parks and Protected Areas (CNPPA) has listed two areas as being under threat. Taï National Park has been listed due to illegal settlement, mining and poaching; Mt Nimba Strict Nature Reserve is listed due to poaching and timber removal.

Systems Reviews Côte d'Ivoire has a coastline of 540km along the Gulf of Guinea, most of which is of comparatively high relief. In the eastern sector the coast becomes flat and sandy, with a continuous littoral sandbar built up by the prevailing longshore drift. Inland, the coastal lowlands rise by a series of shallow stepped plateaux to undulating plains, which in turn continue to rise gently to an altitude of about 100m. From the 6°N parallel the land again slopes upwards reaching a high plateau of 300-500m. A mountain range forms the borders between Côte d'Ivoire, Liberia and Guinea with the highest peak, Mt Nimba (1,752m) situated just inside Guinea where the three countries meet. About 20% of the country is mountainous and quite deeply dissected, with four peaks exceeding 1,000m and many reaching 800m. A watershed occurs on the highlands in the north from which a small part of the country drains northwards into the Niger River, but most of the land drains to the

Atlantic Ocean by a series of rivers flowing more or less due south (Hughes and Hughes, 1991).

The decline in rainfall from south to north is matched by the succession of natural vegetation zones. In the south, the Guinean forest zone includes lowland evergreen rain forest and moist semi-deciduous forest which opens up towards the north into a forest-savanna mosaic and moist derived savanna woodland. Agricultural development has transformed large parts of the originally closed Guinean forest zone into an open landscape in which large plantations and small-scale cultivation intermingle with residual primary forest, secondary growth and swamps. However, the Guinean forest in Côte d'Ivoire is still the largest tract remaining in West Africa (Roth and Hoppe-Dominik, 1990). Rain forest, transitional between lowland and montane, occurs on Mt Nimba in the extreme west. Small areas of mangrove and swamp forest occur on the coast (Davis *et al.*, 1986; IUCN, 1983).

The northern quarter of the country is covered by Sudanian woodland with *Isobertinia*, and gallery forests along the main river courses. Due to the introduction of livestock and other human influences this zone has been extensively degraded and is expanding southwards into the Guinean zone (Roth and Hoppe-Dominik, 1990). In the south of the country coffee, cocoa and bananas are grown as cash crops on large scale plantations, whilst on the northern granitic plain, sorghum, corn and peanuts are grown (Bissio, 1988).

Following a period of intense destruction due to extraordinary economic development, Côte d'Ivoire took draconian protection measures, imposing a total prohibition on hunting. This prohibition has had good results, although fauna and flora are still not out of danger, as poaching still continues (IUCN, 1983).

There are currently 191 classified forests, 128 of which occur within dense forest, the remaining 63 being in savanna. Classified forests in dense forest areas are essentially production forests, and subject to controlled exploitation and replanting. Forests in the savanna are principally protection forests, providing a minimum wooded area in the north of the country.

The present protected area system is extensive, consisting of eight national parks, four other reserves and 150 classified forests, which together cover 14% of the country. The area covered is considered to be adequate, especially as proposals exist for the inclusion of another 896,800ha (almost 3% of the country). However, management and protection needs to be improved (Djédjé Bagnou, 1990). Most habitat types are represented within the protected area system, two of which are only protected in one other country: dense humid Guinean forest in Ghana and mangroves in Senegal.

Proposals to improve the protected areas system are given by Djédjé Bagnou (1990) and Roth and Hoppe-Dominik (1990). Proposals listed by Djédjé

Bagno include: a definitive assessment of the already constituted classified domain and the delimitation of each park and reserve; the effective protection of this area from all encroachment, industrial or agricultural use; fraudulent forest exploitation; poaching and the establishment of new protected areas. Roth and Hoppe-Dominik propose: improvement or the management and protection of the national parks. They consider establishment of suitable administrative structures, in association with the creation of public conservation awareness and staff motivation to be essential. Management of Taï National Park is considered to merit international assistance. Proposals to improve the protected areas system are also summarised by MacKinnon and MacKinnon (1986) and IUCN (1987).

Illegal hunting pressure has built up to such an enormous extent, due to greater accessibility of remote areas, increasing human populations and the insufficiency of protein sources for human nutrition, that, despite the ban on hunting throughout the country from 29 December 1973, poaching remains the most serious problem facing protected areas (Djédjé Bagno, 1990; Roth and Hoppe-Dominik, 1990). Other serious threats come from the pressure to use protected areas, often seen as unproductive areas, for forest exploitation or agricultural plantations. Numerous agricultural, forestry, industrial hydroelectric, mining, road, and rail projects which are under development also pose future threats to protected areas (Djédjé Bagno, 1990). Timber extraction, forest clearance and agricultural settlement in the forest zone and uncontrolled fire and livestock grazing in the savanna zone have now modified or eliminated almost all of the natural vegetation outside protected areas. Even within these, the natural vegetation has been greatly modified by logging and discriminate use. Primary moist lowland forest has been affected most severely, with more than 90% of it now destroyed or modified substantially (Roth and Hoppe-Dominik, 1990).

Addresses

Direction de la protection de la nature de la pisciculture, de l'aquaculture, des pêches en eaux continentales et de l'environnement hydrographique, Ministère des eaux et forêts, BP V 178, ABIDJAN
SODEFOR, BP 3770, Abidjan 01 La Croix Verte, 699 ABIDJAN

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No. 65-425 portant code forestier
(concerning the forest code)

Date: 20 December 1965

Brief description: Provides amongst other things for definitions of categories of land within the state forest domain.

Administrative authority: Ministère des Eaux et Forêts (Ministry of Water and Forests)

Designations:

Fôret classée (Classified forest) To satisfy the country's industrial and traditional wood requirements.

Land set aside: to stabilise the water regime and climate; for soil conservation; for the preservation of an area; for nature conservation; for public health and national defence.

Rights of use regarding the ground are not permitted.

Rights of use regarding fruit and forest products are confined to neighbouring populations and are limited to: collection of dead wood; gathering of food and medicinal fruit and plants; exploitation of industrial wood for construction of traditional houses and dug-out canoes, chasing animals which are forbidden due to the threat they present to people.

Rights of use for commercial exploitation are subject to the issue of a special permit, priority being given to neighbouring populations.

Throughout the forest domain, felling, uprooting, and mutilation of forest species is prohibited without special authorisation.

Fôret protégée (Protected forest) The only part of the forest domain in which rights of use of the ground are permitted. These apply to all citizens of Côte d'Ivoire, following local conditions and with appropriate authority.

Rights of use concerning fruit and natural forest produce are permitted.

Rights of use for commercial reasons are permitted for the produce from non-cultivated plants, providing no damage is caused to the vegetation.

Périmètre de protection (Protection area) Comprise: mountain sides protected from erosion by their vegetative cover; land liable to landslides and gullyng; springs on sloping land.

All rights of use are prohibited.

Reboisement (Reforestation area) Natural forest in which additional trees for industrial purposes have been planted, or area planted with non-agricultural tree species.

All rights of use are prohibited.

Throughout the forest domain, felling, uprooting or mutilation of any protected forest species is prohibited, unless special authorisation is obtained.

Source: Original legislation in French

Title: Décret No. 66-433 portant statut et réglementation de la procédure de classement et de déclassement des réserves naturelles intégrales ou partielles et des parcs nationaux (establishing the status and regulating the classification and declassification procedures of strict or partial nature reserves and national parks)

Date: 15 September 1966

Brief description: Provides amongst other things for the designation of protected areas and for their classification and declassification.

Administrative authority: Secrétariat d'Etat aux Parcs Nationaux (National Parks State Secretariat)

Designations:

Domaine Forestier Classé (Classified Forest Domain)

Réserve naturelle intégrale (Strict nature reserve) Activities prohibited are those given in the Africa Convention (see Annex).

Réserve naturelle partielle (Partial nature reserve) Protected for botanical, zoological, palaeontological, touristic or climatic reasons.

Restrictions may exist on hunting, exploitation of vegetation and building construction.

Areas containing the natural sources for hydroelectricity.

Parc national (National park) A relatively extensive area, representing one or more ecosystems, in general, little, if at all altered by human exploitation or occupation, and where plant and animal species, sites and habitats show a special scientific, educative or recreational interest, or where there is great aesthetic interest.

An area where the highest competent authority in the country (President of the Republic) has taken measures to prevent or eliminate exploitation or occupation throughout.

Visits are permitted for recreational, educational and cultural purposes.

A delimited area managed as an integral reserve with a minimum size of 1,000ha.

Réserve de faune (Faunal reserve) An area for the conservation, management and propagation of animal wildlife as well as for the protection and management of its habitat for human benefit notably for research, tourism and photo safaris.

Prohibited activities include: hunting, slaughter or capture of animals except by officials.

Habitation or other human activities are regulated or prohibited.

Source: Original legislation in French

Title: Décret no. 78-231 fixant les modalités de gestion du Domaine forestier de l'Etat (fixing methods of management of state-owned forests)

Date: 15 March 1978

Brief description: Distinguishes between two principal categories of the forest domain.

Administrative authority:

Designations:

Domaine forestier permanent de l'Etat (Permanent state forest domain) Within forested and savanna areas.

Includes existing classified areas other than those listed in Annex II of this decree, and forests still to be classified by order of the Ministry of Water and Forests.

Area not subject to customary rights of use, and in which clearings are forbidden.

Exploitation within these areas is stipulated in Law No. 65-425. However, measures are also taken to define, delimit and survey the entire area; to organise rational exploitation, and reforestation which will ensure the long-term utilisation of timber stands.

Area can only be reduced by decree of the council of ministers.

Non-forested areas can be included, by joint authority of the ministers of Water and Forests and of Agriculture, to allow for their reforestation to ensure the maintenance of ecological equilibrium.

Domaine forestier rural de l'Etat (Rural forest domain of the state) Comprises existing classified forests, listed in Annex II of this legislation, as well as non-classified forests of the State forest domain which are not subject to a particular statute such as national park or reserve.

The classified forests are subject to agricultural management plans, and are declassified when these plans are put into order and the land is cleared.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Azagny	II	19,000	1981
2	Banco	II	3,000	1953
3	Comoe	II	1,150,000	1968
4	Iles Ehotile	II	10,500	1974
5	Marahoue	II	101,000	1968
6	Mont Peko	II	34,000	1968
7	Mont Sangbe	II	95,000	1976
8	Tai	II	350,000	1973
	<i>Strict Nature Reserve</i>			
9	Mont Nimba	I	5,000	1944
	<i>Fauna and Flora Reserve</i>			
10	Haut Bandama	I	123,000	1973
	<i>Botanical Reserve</i>			
11	Divo	IV	7,350	1975
	<i>Partial Faunal Reserve</i>			
12	N'Zo	IV	95,000	1972
	<i>Biosphere Reserves</i>			
	Parc national de la Comoe	IX	1,150,000	1983
	Parc national de Tai	IX	330,000	1977
	<i>World Heritage Sites</i>			
	Comoe National Park	X	1,150,000	1983
	Mont Nimba Strict Nature Reserve	X	5,000	1982
	Tai National Park	X	330,000	1982



Protected Areas of Côte d'Ivoire

REPUBLIC OF DJIBOUTI

Area 232,000 sq. km

Population 400,000 (1990)

Natural increase: 3.0% per annum

Economic Indicators

GDP: US\$ 1,172 (1987)

GNP: No information

Policy and Legislation Djibouti (formerly a French colony "Territoire Française des Afars et des Issars") became independent from France in 1977.

The Forêt du Day was declared a national park in 1939 by the then governor of the country. Current legislation relevant to protected areas includes: Resolution (délibération) No. 262/7 of 12 May 1972 relating to the protection of natural wealth and prehistoric remains (rélatve à la protection des richesses naturelles et des gisements préhistoriques); Decree (arrêté) No. 72-1363 of 20 September 1972 fixing measures for the protection of marine fauna and habitats (fixant les mesures de protection de la faune et des fonds sous-marins) (see Annex), and Decree No. 80-062/PR/MCTT of 25 May 1980 on the protection of marine fauna and habitats (Décret portant sur la protection de la faune et des fonds sous-marins) (see Annex). Decree No. 80-062 was passed following a meeting of the Commission for the Safeguard of Fauna and Underwater Areas (Commission de sauvegarde de la faune et des fonds sous-marins) on 7 November 1979, after which a "procès verbal" was drawn up, which concerned the complete revision and strict reinforcement of current legislation (MCTT, 1979).

Administration of some environmental matters is provided for under Decree (décret) No. 86-050 PR/MCTT concerning the organisation of the "Office du Tourisme et de l'Artisanat".

A National Conservation Strategy has not yet been defined (Laurent, 1989).

International Activities Djibouti has ratified the 1968 (Algiers) African Convention of Nature and Natural Resources, which provides definitions of strict nature reserve, national parks and special reserves. It has not ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor does the country participate in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). No sites have been designated as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme.

Administration and Management The Office National du Tourisme et de l'Artisanat within the Ministry of Commerce, Transport and Tourism

(Ministère du Commerce, des Transports et du Tourisme) is responsible for the protection of the environment. Within this office, a Section for the protection of sites and environment (Service de la Protection des Sites et de l'Environnement) was created in 1986 (Laurent, 1989).

The Ministry of Agriculture (Ministère de l'Agriculture et du Développement Rural) is concerned, mostly through the intermediary of the Agriculture Section (Service de l'Agriculture), with agricultural development, reforestation and control of desertification. The department of Wildlife and Fisheries (Direction de l'Élevage et des Pêches), within the same department is responsible, amongst other things, for the organisation of the protection and management of terrestrial and marine wildlife. The Institute for Higher Study and Scientific and Technical Research (Institut Supérieur d'Études et de Recherches Scientifiques et Techniques) is responsible for scientific research, and is responsible for managing, together with the Office National du Tourisme et Artisanat, Musha Territorial Park and Maskali South strict reserve (Laurent, 1989).

A draft management plan for Day National Park has been drawn up by Blot (1983).

Infractions against the law concerning strict reserves include prison sentences of up to three months, and fines, and confiscation of diving equipment and weapons. Recently there has been a severe increase in illegal poaching and capture of young animals for resale (Laurent, 1989).

Systems Reviews Djibouti is one of the smallest of all African countries. It lies on the east coast of the continent, enclosed by Eritrea, Ethiopia and Somalia and has a coastline of about 370km. In shape it resembles a "C", the centre of the "C" being the Gulf of Tadjourah which converges with the Gulf of Aden to the east. Apart from the Goda mountain range in the north, which reaches 1783m, the country is principally flat, and comprised of desert and steppe habitats. There are also volcanic areas, mainly in the north and west, the northern border being the frontier with the largely volcanic Danakil Depression which lies at the mouth of the African Rift (Welch and Welch, 1984). Coral reefs occur to the west of the port of Djibouti and in the archipelago of the Sept Frères, the entrance to the Red Sea. The reefs are generally shallow although corals have been found at a depth of over 35m (IUCN/UNEP, 1986).

The only areas of dense forest are on Goda and Mabla, the Forêt du Day on Goda being the larger and better example. The forest is on the east face of the mountains, mainly on two small plateaux, at a height of around 1,500m (Welch and Welch, 1984). The region has floristic affinities with the Somalia-Masai region. The degree of endemism is unknown, only one species being

mentioned by Brenan (1978). In general the flora is poorly known, but is likely to be rich, especially in the Goda Mountains (Davis *et al.*, 1986). Threats to natural attributes of the country, such as Lake Abbe, Ardoukuoba volcano, and Lake Assal, were considered by Hancock (1981) to be minimal with no major development schemes planned. However, the Forêt du Day, containing one of the only two relict forested areas of the country, is disappearing at an alarming rate, apparently due to a combination of man-induced degradation and climatic conditions (Welch and Welch, 1984). The forest is now further threatened by the planned construction of 30 second homes in one of the less-disturbed parts.

The protected area system currently comprises three reserves, Forêt du Day National Park (which covers less than 0.05% of the land) and two marine reserves. Musha (Mouscha) Islands Territorial Park protects an area of coral reef extending from the lighthouse at Musha to the Ile du Large (except the Banc Dankali). South Maskali Islands Integral Reserve is part of this park and extends from the Musha lighthouse to a large coastal sandbank.

A pilot project for the development of natural resources and to combat desertification in the coastal plain, was established in 1984.

Proposals to improve the protected areas system are made by several authors. Welch and Welch (1985) recommend: establishment of a national park in the Goula region of the Mabila mountains; compilation of management plans for both the Forêt du Day and Mabila; development and implementation of an educational programme for the local inhabitants of both areas; protection of young junipers in the Forêt du Day and development of an active planting programme and reduction of human disturbance, particularly in the Forêt du Day, to aid regeneration of trees and reduce erosion. Recommendations to improve the protected areas system given by MacKinnon and MacKinnon (1986) and repeated in IUCN (1987) include: protection of the existing Forêt du Day National Park, and its extension to include as much as possible of the remaining relict of the adjacent Goda Mountain Forest; and restrictions and control of visitors and military use of the forest. Other proposed conservation activities include development of alternative sources of firewood and timber for the communities living in and around the forest, perhaps by establishing community plantations as buffer zones; development of conservation awareness with education programmes to increase public awareness of wise use of natural resources, and encouragement of cooperative conservation and tourism programmes between Djibouti and Ethiopia in the lakes region on their common border in the Danakil Depression. Laurent (1989) proposes, amongst other things, the establishment of faunal

reserves, with four objectives: conservation, restoration, education and for tourism. Implementation of education and training programmes for all levels of the population is recommended.

Threats to the coral reefs include: coral collection; sub-marine hunting; dredging and anchor drag; military explosions and an increase in water turbidity (A. Laurent, pers. comm., 1986).

Address

Service de l'agriculture, de l'élevage, des eaux et des forêts, Ministère de l'agriculture et du développement rural, BP 224, DJIBOUTI

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ANNEX

Definitions of protected area designations, as legislated,
together with authorities responsible for their administration

Title : Arrêté No. 72-1363 of fixing measures for the protection of marine fauna and habitats (fixant les mesures de protection de la faune et des fonds sous-marins)

Date: 20 September 1972

Brief description: Provides, *inter alia*, definitions of territorial parks and reserves

Administrative authority:

Designations:

Parc territorial (Territorial park) Prohibited activities include: fishing of any sort; collection of coral and shellfish.

Réserve (reserve) Traditional fishing is permitted. All other forms of fishing including collection of coral and shellfish is prohibited.

Source: Original legislation in French

Title : Decret No. 80-062/PR/MCTT portant sur la protection de la faune et des fonds sous-marins (concerning the protection of marine fauna and habitats)

Date: 25 May 1980

Brief description: Provides restrictions on underwater hunting, and for the protected areas listed below.

Administrative authority:

Designations:

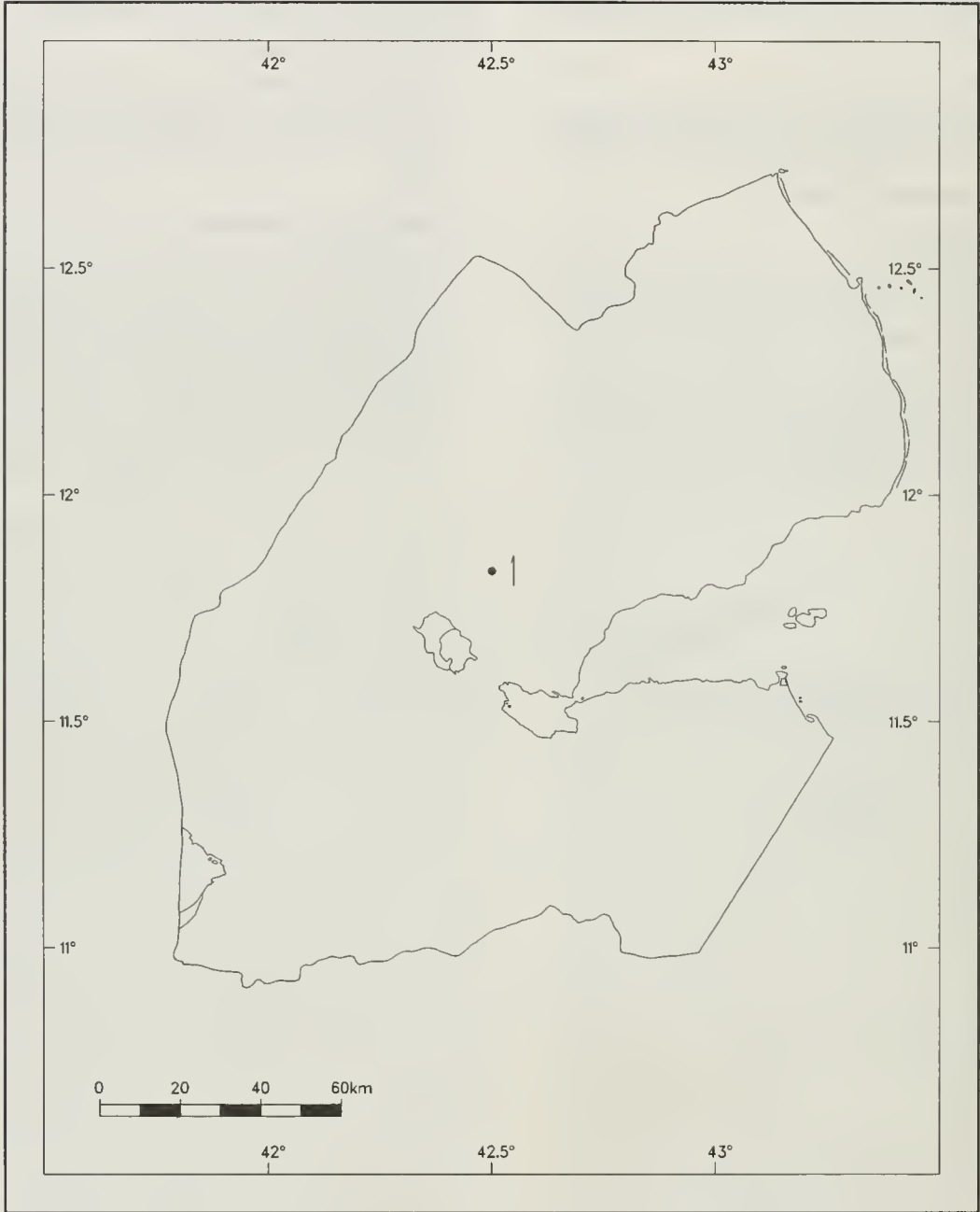
Parc territorial de Musha (Musha territorial park) All fishing activities of any sort, and collection of coral and shellfish are prohibited.

Réserve intégrale (Strict reserve) All aquatic and subaquatic activities are prohibited.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	National Park Foret du Day	II	10,000	1939



Protected Area of Djibouti

EQUATORIAL GUINEA

Area 28,050 sq. km

Population 0.4 million

Natural increase: 2.6% per annum

Economic Indicators

GDP: US\$ 338 (1987)

GNP: US\$ 350 (1988)

Policy and Legislation Equatorial Guinea was a Spanish colony (Territorios Españoles del Golfo de Guinea) until 1960. The territory was then divided into two Spanish provinces with a status comparable to the metropolitan provinces until 1963, when they were rejoined as an autonomous Equatorial Region. An independent republic formed of the two provinces was established in 1968, and finally an unitary state was created in 1973.

Reserves created prior to independence appear to have been established by Ministerial Decree. Since independence, until 1988, the system of national parks and reserves established by the Spanish administration (Rio Ekuka Game Reserve, Mt Raices and Mt Alen reserves) were no longer formally recognised. Under the Decree of 31 December 1988 (No. 8/1988), the President announced certain regulations with respect to wildlife, protected areas and hunting. These include establishment of the legal basis to create protected areas (Castroviejo *et al.*, 1990; MALFF, 1991).

Prior to the promulgation of the first national forest law in 1981, forestry legislation was much dispersed and had become to a large extent obsolete. The old legislation had consisted of a series of decrees and administrative rules adopted before independence. Law No. 14/1981 (Decreto-ley forestal No. 14/1981) (see Annex) introduced a consolidated basic forest law, which represented considerable progress in forestry development. State, communal and private forests are defined. Basic provisions for wildlife conservation, management and hunting control are also given. Regulations for the declaration of national parks, and various forms of public and private hunting districts are established (Schmithüsen, 1986). Forestry legislation is reviewed in IUCN (1989, n.d.). Extensive laws concerning the environment, forests and wildlife were passed in 1988. These state that conservation and sustainable utilisation of forest fauna should be for the benefit of the nation and people (MALFF, 1991).

Legislation providing for national parks (parques nacionales), scientific reserves (reservas científicas), faunal refuges (refugios de fauna) and wildlife sanctuaries (santuarios de vida silvestre) is provided for under Law No. 8/1988 of 31 December 1988, regarding Wildlife, Hunting and Protected Areas (Ley Num. 8/1988 reguladora de la Fauna Silvestre, Caza y Areas Protegidas) (see Annex). This law also lists a number of

infractions including hunting within protected areas, for which a minimum fine of FCFA 10,000 is levied.

Law No. 6/1990 passed on 22 August established the National Committee for the Protection of the Environment (Comite Nacional de Protección del Medio Ambiente), within the Ministry of Agriculture, Livestock, Fisheries and Forestry. This Committee is empowered to protect natural resources (MALFF, 1991). Law No. 3/1991 passed on 4 April regulates the use of natural forests, and includes additional regulations on the hunting and capture of wildlife (MALFF, 1991).

International Activities Equatorial Guinea is one of the few countries not to be party to the 1968 (Algiers) African Convention of Nature and Natural Resources. It is not party to the Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). No sites have been designated as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme.

Administration and Management Responsibilities for all matters pertaining to wildlife and protected areas (and fish) falls to the Directorate of Forestry, within the Ministry of Agriculture, Livestock, Fisheries and Forests (Ministerio de Agricultura, Ganaderia, Pesca y Forestal). The present structure of the Directorate of Forestry comprises a Director General, three professional officers, one technical officer and 18 subordinate class staff (forest guards etc.). The Directorate of Forestry combines four sections, one of which is the Hunting and Protected Areas Service (Servicio de Caza y Areas Protegidas), although this has no personnel, vehicles or equipment. No government department has specific and sole responsibility for conservation, and there is at present no management of the nine recently gazetted protected areas (MALFF, 1991).

Several international projects concerning forest resources are being carried out. The "Proyecto de Investigación y Conservación de la Naturaleza en Guinea Ecuatorial", which commenced in 1985, focuses on biological research and nature conservation, including the training of national personnel in research on natural ecosystems and the creation of a protected areas network. It is funded by the Cooperación Española and undertaken by scientists from the Estación Biológica de Doñaña in Spain.

The Elephant Conservation Plan presents seven project proposals of direct relevance to elephant conservation, two of which are concerned with park management (MALFF, 1991). Only one of these projects is currently funded, an EC-backed project for the conservation and integrated development of Monte Alen Protected Area in the northern sector of the Niefang mountain range

(Castroviejo *et al.*, 1990; MALFF, 1991). Other current internationally funded projects include an FAO/UNDP forest inventory and management plan, and an EEC-backed project on timber commercialisation and forest conservation.

Systems Reviews Equatorial Guinea comprises mainland territory, and several islands. The mainland, Mbini, is bounded on the north by Cameroon, on the south and east by Gabon, and on the west by the Gulf of Guinea in which lie the islands of Bioko (formerly Macias Nguema, formerly Fernando Po) and Annobon (called Pagalu from 1973 to 1979). Bioko, the largest of four islands in the Gulf of Guinea (the middle pair comprising the republic of Sao Tomé and Príncipe), is the closest to the mainland, lying on the continental shelf only 32km from the coast of Cameroon. Annobon is the smallest and most remote of the four islands, lying 180km further to the south-south-west of Sao Tomé and 340km from the mainland. The four islands form the southern part of the Cameroon Line of tertiary to recent volcanoes, which also includes, on the mainland to the north, the mountains Cameroon, Manengouba and Oku and the volcanoes of Adamawa. While Bioko has been connected by land to the continent in the recent past when sea levels were lower, the other three islands are separated by seas over 1,800m deep and have never been connected by land neither with each other nor with mainland Africa (Jones and Tye, 1988). Bioko has a rugged topography which reaches 3,017m on the volcanic cone of Pico Basile. Annobon comprises a jumble of volcanic cones, the central high point being 655m. The relief of Mbini is complex, the land surface rising from a coastal plain through a series of stepped tablelands into the interior, with a number of granitic inselbergs. The highest mountains reach 1,114m. Most of the area lies within the basin of the Uolo (Benito) River (Castroviejo *et al.*, 1990).

Dense, humid equatorial forest formerly covered most of Mbini, with areas of dense mangroves along the three major estuaries and a narrow belt of savanna on the coast. Grass covered granitic domes "cerro cupulas" which emerge from the tropical forest are unique vegetation formations, common in the east of Mbini. Natural vegetation on Bioko is characterised by altitudinal zonation, from formerly extensive areas of moist lowland forest at low altitudes through montane forest, a tree fern zone and montane scrub to subalpine and alpine meadows on the summits (Castroviejo *et al.*, 1990; Hughes and Hughes, 1991). The flora of Mbini has Guinea-Congolian affinities and is considered likely to be rich. Data for levels of endemism are not available. Bioko has over 1,000 species, of which 49 are endemic; Annobon has 208 species of which 17 are endemic (Davis *et al.*, 1986). Timber exploitation and clearance for shifting agriculture have affected substantial areas of the country, but much of the forest is still intact, moist tropical forest still covering large areas of both Mbini and Bioko.

Cash crops account for 50% of GDP, principal products being cocoa, coffee, palm oil, bananas, cassava and timber (okoume timber) (MALFF, 1991).

Monte Alen Partial Reserve and several other parks and reserves were established prior to 1970, but were completely unprotected during the 1970s and 1980s (Castroviejo *et al.*, 1990). The natural parks of Spanish Guinea were once reported to be very good, especially Rio Ekuku Game Reserve (7,500ha) protecting sitatunga and Mont Raices Park (26,000ha) which had chimpanzee, gorilla and buffalo (J. Sabater Pi, pers. comm., 1984).

Nine areas, formerly recommended for reserve status by the Spanish Cooperation project "Proyecto de Investigación y Conservación de la Naturaleza en Guinea Ecuatorial" (Castroviejo *et al.*, 1986) have been accorded formal protection: on the island of Bioko, Pico de Basile and Sur de la Isla Bioko; the island of Annobon; and on Mbini-Ntem, Acurenam Nsoc, Mont Alen, Mitra, Rio Muni and Ndote (MALFF, 1991). All protected areas on Mbini, with the exception of Ntem, lie south of the Uolo River.

Castroviejo *et al.* (1986, 1990) and Fa (1990) made a number of recommendations concerning the establishment of this network of protected natural areas for cultural, scientific, educational and aesthetic reasons. Castroviejo *et al.*, (1986, 1990) consider that strict protection and exclusion of human activity are not feasible in the protected areas. Instead, they suggested that the areas should be managed for the sustainable use of natural resources. Logging, cultivation and hunting should be kept to a minimum within core areas and rare animal species should be protected from exploitation, while there could be sustained-yield offtakes of the commoner species. However, Butynski and Koster (1989) suggest that, on Bioko at least, a minimum of 60% of each protected area should be designated as a strictly protected "core" areas and that only the remaining 40% of the buffer zone should be used for sustainable, multiple-use land practices. In addition to stressing the need for the establishment of protected areas, they emphasise the need for: appropriate laws concerning wildlife utilisation; the establishment of research programmes and development of a national environmental policy to overcome the interlinked problems of deterioration of forest resources, population pressure for agricultural land and the national indebtedness. Fa (1989) recommended that a further two areas required protection: Bata-Rio Uolo (a narrow strip along the coast) and Evinayong/Mongomo, lying north of Nsoc Reserve.

A study, funded by WWF-US and the Chicago Zoological Society, of marine turtles on Bioko, includes recommendations for the establishment of a protected area on the island (Butynski and Koster, 1989). A further report by Butynski and Koster (1986) outlines three conservation strategies: to monitor the turtle population;

establish a conservation education programme; and control the squirrel population.

Recommendations for the establishment of a protected areas system are summarised in MacKinnon and MacKinnon (1986) and IUCN (1987).

Equatorial Guinea is one of the least developed countries in Africa and faces severe economic difficulties. Forestry is the main industry and is likely to extend into all remaining primary forests within the next two decades. In Mbini, heavy hunting pressure north of the Uolo River has had a devastating effect on wildlife in many areas, but the situation is much better south of the Uolo. On Bioko, hunting pressures are high in populated areas but low in substantial areas of the island which have few or no inhabitants (Alers and Blom, 1988; Castroviejo *et al.*, 1990).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Decreto-ley forestal No. 14/1981 (Forest Decree-Law No. 14/1981)

Date: 29 September 1981

Brief description: Provides, amongst other things, definitions of land within the forest domain.

Administrative authority: Directorate of Forestry

Designations:

Bosque público estatal (State forest) Includes zones of primary tropical forests in which timber harvesting may be organised by the forest service or by granting forest concessions with a maximum duration of 20 years. Special permits for subsistence agriculture and domestic timber used may be issued free of charge.

Bosque publico comunale (Communal forest)
Timber harvesting may be undertaken by the community itself, by the state or by granting concessions. Revenues that accrue from communal forest land are reserved for local entities; 20% of all revenues are withheld in order to finance improvements in these forests.

Bosque privado (Private forest) Produced by reforestation on private land and are subject to state supervision.

Source: Schmithüsen (1986) and original legislation in Spanish

Title: Ley Num. 8/1988 reguladora de la Fauna Silvestre, Caza y Areas Protegidas (Law No. 8/1988 of 31 December 1988, regarding Wildlife, Hunting and Protected Areas)

Date: 29 September 1981

Brief description: Provides, amongst other things, definitions of areas listed below.

Administrative authority: Directorate of Forestry

Designations:

Parque nacional (National park) Relatively large areas in which unaltered primitive ecosystems exist where plant and animal species, as well as sites and geological formations, are of a particular cultural, educational or touristic interest, or where natural landscapes of great beauty are to be found.

The state will decide the measures necessary to protect a site's characteristics and values, which motivated its declaration, in order to facilitate access for the structured use, enjoyment, contemplation and benefit of its resources, restricting those activities which could directly or indirectly cause damage to or destroy it.

Reserva cientifica (Scientific reserve) Areas of the national territory required for the development of experimental programmes or for research, preservation and protection of wildlife to ensure its conservation.

Access restricted to research personnel.

Refugio de fauna (Faunal refuge) Areas for the scientific study necessary to ensure the protection, conservation and propagation of wildlife, principally those species, either resident or migratory, considered rare or in danger of extinction.

Santuario de vida silvestre (Wildlife sanctuary) Can be established following research and studies at the instigation of any public or private entity. The motive must be specified on declaration as well as the body or organisation responsible for management which can be any association or body, public or private, national or international, whose aims are those of nature conservation or research.

The size of parks, reserves, refuges and sanctuaries cannot be reduced, or parts of them destined to uses other than those for which they were established, without prior agreement of the competent authority. However, the chosen modality of an area can be modified by following the established legal procedures. In the same way, the declaration of a protected area does not exclude the possibility of establishing other zones of protection within them, providing that one of the same aims defined in the preceding articles is adopted.

Activities cannot be undertaken which are contrary to the aims for which the site was created; it cannot be colonised nor fragmented, according to the Regulations of this Law and other legal measures.

Source: Original legislation in Spanish

ETHIOPIA

Area 1,221,900 sq. km

Population 51,700,000 (1990)
Natural increase: 2.9% per annum

Economic Indicators

GDP: US\$ 121 per capita (1987)
GNP: US\$ 120 per capita (1988)

Policy and Legislation Currently there is no constitution in force. The Revised Constitution of 1955, suspended by the Provisional Military Government Establishment Proclamation of 1974, had one provision of direct relevance to forest and wildlife conservation. Under Article 130, all natural resources were declared to be state property and the government was empowered to take all necessary measures for their conservation (Moore, 1982).

One of the earliest pieces of legislation creating protected areas was the *Gazzetta Eritrea* (No. 4) of 16 March 1959. By virtue of this legislation, three absolute reserves were created in Eritrea. Other early laws allowing for the creation of national parks are the Awash National Park Order No. 54 of 1969 and the Simen National Park Order No. 59 of 1969. The Wildlife Conservation Regulations (No. 416) of 19 January 1972 were issued by the Minister of Agriculture pursuant to the authority vested in him by Article 4 of Game Proclamation No. 61 of 1944 and Article 10 of the Wildlife Conservation Order No. 65 of 1970. These regulations constitute the main body of rules on wildlife management and conservation, and make provision for the creation of national parks, game (wildlife) reserves, sanctuaries and controlled hunting areas (Annex). The Forest and Wildlife Conservation Proclamation No. 192 of 5 September 1980 allows for the demarcation, registration and administration of state forests, national parks, wildlife reserves, sanctuaries and areas for afforestation, controlled hunting and scenic attraction. It also makes provision for the establishment of protective forests and Kebele forests (Annex). This proclamation repeals State Forest Proclamation No. 225 of 1965, Protective Forests Proclamation No. 227 of 1965, Game Proclamation No. 61 of 1944, and Wildlife Conservation Order No. 65 of 1970, amongst others. It does, however, keep in force the Wildlife Conservation Regulations of 1972 and the Wildlife Conservation (amendments) Regulations No. 445 of 1974. The Proclamation establishes the administrative authority for managing conservation areas and forest reserves and sets out offences and penalties in connection with protected areas. Related forestry legislation still in force includes the Protection of State Forest Regulations No. 344 of 1968, which prohibits certain destructive practices in state and protective forests, and unauthorised grazing. The Exploitation of State Forest Regulations No. 345 of 1968 stipulates that exploitation of state forests are

reserved to the authority itself, to villagers and local inhabitants under cutting permits and to concessionaires under sales contracts. The Management of Protective Forests Regulations No. 347 of 1968 states that all utilisation, conservation and afforestation operations in protective forests must be carried out in conformity with an approved management plan. The Penal Code Proclamation of 1957 contains several provisions relating to forest and wildlife conservation including, *inter alia*, penalties for contravening rules or regulations protecting national, historical, archaeological and artistic wealth or natural sites, and unlawful entry into reserved hunting or fishing lands. Legislation is currently pending on the legal gazettement of national forest priority areas (NFPAs) which serve both a conservation and production function (Kidane, pers. comm., 1991). By virtue of the Nationalisation of Rural Lands Proclamation of 1975, all private ownership of forests was abolished.

In support of protected areas legislation are a number of policy statements. In 1975, the government, in its statement of economic policy, stated *inter alia*, that preservation of wildlife would be actively followed by the state (Moore, 1982). The Wildlife Management Policy emphasises the government's commitment to the conservation, wise development and utilisation of wildlife within the framework of land use planning, economic and social development. Interests of wildlife in national parks are considered to be of paramount importance (Hillman, 1986b). The Ten-year National Programme for the Conservation and Management of Forests, Wildlife, Soils and Water (NP), prepared in 1986, sets out, *inter alia* that forest policies, laws and regulations were to be improved (FAO, 1988). Subsequently, new forest policy guidelines were completed in 1989 and are currently awaiting final approval and implementation (Kidane, pers. comm., 1991). Currently, there is no coherent national policy covering forestry, soil, water, wood-based energy, wildlife conservation and development (FAO, 1988). To this end, Ethiopia, with the assistance of IUCN, initiated a national conservation strategy (NCS) development programme, which in 1990 entered the policy formation phase (Kidane, pers. comm., 1991).

As early as 1972, the Plan for Action and Development of Wildlife Resources listed several major problems in wildlife conservation, including *inter alia* failure of existing legislation and enforcement (FAO, 1988). Existing laws need to be reviewed and regulations enacted, including gazettement of all conservation areas (Ashine, 1983). To date, only Simen and Awash national parks have been legally gazetted. In addition, a number of national forest priority areas have been demarcated, but none has been legally established as yet (Kidane, pers. comm., 1991). Recommendations to expand the regulations relating to state forests and wildlife

conservation areas include: definitions for the various types of wildlife conservation areas; procedures to be followed in declaring protected areas; and provisions relating to the management and administration of state forests, national parks and other conservation areas, including preparation of management plans (Moore, 1982).

International Activities At the international level, Ethiopia is party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), which it ratified on 6 July 1977. To date, seven sites have been listed under this convention, one of which is natural and six of which are cultural. Ethiopia is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) programme. At the regional level, Ethiopia is signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management Forestry development in the People's Democratic Republic of Ethiopia (PDRE) began with the creation of the Department of Forestry, Game and Fishery within the Ministry of Agriculture in 1945 (Kidane, pers. comm., 1991). In 1964, this Department was dissolved and the Wildlife Conservation Department created (Ashine, n.d.; WCO, 1985). At the same time, a Wildlife Conservation Board was established which advised the Minister on general policy matters concerned with conservation and national parks (Blower, 1971). By virtue of Wildlife Conservation Order No. 65 of 1970, the Wildlife Conservation Organisation (WCO) was created which was responsible for the creation and management of wildlife reserves (Ashine, n.d.). Order No. 74 of 1971 created the State Forest Development Agency (SFDA, later SFoDA) which had responsibility for managing the forest resource. In 1980, the State Forest Development Agency and the Wildlife Conservation Organisation were amalgamated to form the Forest and Wildlife Conservation and Development Authority (FaWCDA) by virtue of Proclamation No. 192 of 5 September 1980 (Kidane, pers. comm., 1991). In December 1984, FaWCDA was dissolved and forestry and wildlife were incorporated within the Natural Resources Conservation and Development Main Department (NRCDMD), in the Ministry of Agriculture, now the Ministry of Agriculture and the Environment (Kidane, pers. comm., 1991). The NRCDMD has overall responsibility for issuing and implementing directives concerning conservation, and for demarcating and managing state forests and conservation areas (FAO, 1988). The NRCDMD operates with a central organisation and thirty regional offices. As of 1988, staff strength of NRCDMD was about 8,000 employees, including 1,000 in professional or technical categories (FAO, 1988). The annual budget allocation for the period 1985-1987 was Birr 311.3 million, comprising

Birr 148.8 million as GOE allocation and Birr 162.5 million as foreign assistance (FAO, 1988).

Falling under the NRCDMD is the Ethiopian Wildlife Conservation Organisation (EWCO), which is directly responsible for the establishment, administration and management of national parks, sanctuaries, wildlife reserves and controlled hunting areas (WWF, 1988). As of 1991, the EWCO had a total of 306 staff members (Hillman, pers. comm., 1991). All national parks have a warden in charge and a support staff of wildlife guards and administrative personnel (Ashine, n.d.). The State Forest Conservation and Development Department (SFCDD), also under the NRCDMD is comprised, *inter alia* of the National Forest Priority Areas Coordination Division (NFPA-CD) and the Forest Demarcation, Inventory and Management Plan Division (FDIMDP). At a regional level, the Ministry of Agriculture and the Environment oversees the Natural Resources Conservation and Development Team (NRCDMD-T) which, in collaboration with FDIMDP, NFPA-CD and other divisions, establishes, manages and develops national forest priority areas (Kidane, pers. comm., 1991). As of 1991, there were 1,239 staff managing 58 national forest priority areas (Kidane, pers. comm., 1991). Peasant associations (PAs) (Kebeles) were created in 1975 to implement the programme of land distribution and to provide an organisational structure in rural areas. PAs are also charged with the responsibility of using and preserving natural resources, especially soil, water and forests in their areas of jurisdiction. On average, each Peasant Association covers an area of 800ha with about 200 peasant families (FAO, 1988). As of 1984, PAs numbered 19,867 with 5,539,000 families as members. The PAs are organised in a hierarchy to allow for decision making at the Woreda, Awraja, regional and national levels (FAO, 1988). Currently, the SFCDD is conducting pilot work on how best to integrate PAs in forest management as a viable economic alternative to regulations which tend to set the community and foresters at odds (IUCN, 1986). Urban dwellers associations (Kebeles) are required, *inter alia* to develop, protect and maintain forests within their areas of jurisdiction. These associations are answerable to the municipal or urban authority, which falls under the jurisdiction of the Ministry of Urban Development. Within this ministry, there is also an Urban Dwellers Association Department which is responsible for assisting the Kebeles (IUCN, 1986).

There are a number of national and international non-governmental organisations involved in the conservation, management and development of protected areas. IUCN and WWF have been involved in conservation efforts and projects in support of the country's national parks on an intermittent basis since 1966 (IUCN, 1986). The focus of WWF and IUCN activities has been primarily on Bale Mountains and Simen national parks (IUCN, 1986). With support from World Conservation International (WCI) and the New York Zoological Society (NYZS), a comprehensive

management plan for Bale Mountains National Park was prepared, which has been fully endorsed by EWCO (Hillman, 1986a; WWF, 1988). The World Heritage Committee (Unesco) has provided logistical support to the Simen World Heritage site in terms of vehicles and support for the preparation of a management plan, while the African Wildlife Leadership Foundation has conducted a preliminary survey of the Red Sea in and around the proposed Dahlac Islands Marine National Park (WCO, 1985; IUCN, 1986). In 1986, a three week research expedition into the Harenna Forest area of Bale Mountains National Park was conducted by the EWCO, the Natural History Museum and National Herbarium of the University of Addis Ababa, Liverpool Museum and Manchester University. The overall objective of the expedition was to provide ecological information for the future conservation and management of this moist tropical forest area (EWCO, 1986; Hillman, 1986a). This expedition was supported by WCI/NYZS and the Royal Society (Hillman, pers. comm., 1991). The Ethiopian Valleys Development Studies Authority, with the assistance of several bilateral and multilateral agencies, is preparing plans for integrated river basin development, including forestry, wildlife and natural resources conservation and recreation (FAO, 1988). A number of Ethio-German Forest Rehabilitation projects took place between 1974 and 1988 involving forest demarcation and advisory services to SFCDD (FAO, 1988). The Norwegian SSE Programme, with the University of Oslo Biology Department is currently conducting a five-year wildlife management study in Borena Region, southern Ethiopia (Hillman, pers. comm., 1991).

There are a number of constraints to protected areas management. The NRCDDM is in need of a strong and properly trained staff for the overall planning, monitoring, evaluation and coordination of management activities at the national level (FAO, 1988). As of 1988, the trained staff consisted of 106 degree holders, 724 diploma holders and 415 certified holders as against an estimated demand of 935 degree holders, 1,300 diploma holders, 4,700 certificate holders, 200,000 Natural Resource cadres and 350,000 peasants by the year 2000 (FAO, 1988). The EWCO is virtually powerless to enforce regulations and to develop and implement management plans for most protected areas due to basic shortages in manpower and resources (Ashine, 1983; WCMC, 1989; WCO, 1985; WWF, 1988). Management of conservation areas suffer from poor communications and infrastructural facilities, lack of transportation networks, making many areas inaccessible; a lack of local awareness concerning conservation goals and values; and a lack of basic scientific information upon which to make sound management decisions (Hillman, 1986a; Hurni, 1986; WWF, 1988). Forest reserves are mostly inaccessible, are poorly managed, and also suffer from a lack of funds and resources (FAO, 1988).

With respect to conservation areas, resources have been directed to the development of national parks and

sanctuaries, which, in practice, are treated almost equally, since sanctuaries are set up to conserve threatened wildlife taxon and the production of harvestable animals is not permitted (Ashine, pers. comm., 1989). While still more or less recognised, wildlife reserves and controlled hunting areas exist on paper only (Hurni, 1986; Hillman, pers. comm., 1988). This is also true for Dahlac Marine National Park. While Gambella National Park has virtually ceased to exist as a conservation area, Yavello Sanctuary has been taken over for a livestock project, and Bale Mountains National Park has suffered from uncoordinated development in and near its boundaries (Hillman, 1986a; WCMC, 1989). Further, Simen Mountains National Park is listed as threatened by the IUCN Commission on National Parks and Protected Areas.

Systems Reviews Ethiopia is separated from Saudi Arabia and Yemen to the north by the Red Sea, while Djibouti, Somalia, Kenya and Sudan form its other borders (WCMC, 1989). The country consists of two high plateau regions, separated by the Rift Valley which runs from the south-west corner of the country towards the Red Sea and Gulf of Aden in the north-west (Friis *et al.*, 1982; WCMC, 1989). Lowland plains range in altitude from 200 to 500m, while several mountain peaks rise to 4,550m (Ashine, 1983; Friis *et al.*, 1982). Highlands above 1,500m occupy 44% of the country and contain 88% of the population at an average density of 45 persons/sq. km (IUCN, 1986). The highlands include 90% of the agriculturally suitable land, two-thirds of the country's livestock and account for 90% of Ethiopia's economic activity (FAO, 1988; IUCN, 1986; WCMC, 1989).

The biogeographic affinities are predominantly Afromontane in the centre of the country with Afroalpine elements at the highest altitudes, Somali-Masai in the south and east and in the Rift Valley, Sudanian in the west, and Sahel Regional Transition Zone in the far north (Stuart and Adams, 1990). Existing natural woody vegetation, totalling 27,898,000ha, comprises 3,479,000ha of closed forest, 600,000ha of riverine forest, 700,000ha of mangrove forest, 450,000ha of bamboo forest woodlands, 2,500,000ha of mixed deciduous woodlands, and 20,000,000ha of savanna woodlands (SFCDD/MoA, 1990). The natural vegetation of the plateau and highlands above 1,800m is mostly coniferous forest, most of which has disappeared and is now found only in the more inaccessible regions. In the south-west of the country are found extensive broad-leaved rain forests with a high diversity of species, while in the lowlands there is a range of dry-zone vegetation, ranging from limited areas of desert to savanna woodlands (Davis *et al.*, 1986). As of 1990, the major forms of land use were: cropped land (14.8%) consisting of annual and perennial crops; grazing and browsing land, grassland and fallow (51.0%); forest, bush and shrubland (11.7%); unproductive land (3.8%) and unutilisable land (18.7%) (IUCN, 1990).

As a result of accelerating population growth, expanding agriculture, overgrazing, fuel wood demand in and around settlements, and uncontrolled exploitation, forest cover has been drastically reduced and much land has become unproductive and seriously eroded (FAO, 1988; IUCN, 1986; WWF, 1988). Gamachu (1988) has estimated that 34% of the total area of the country (and about 87% of the total area above 1,500m) was originally covered by dense forests and a further 20% by woodland/savanna (WCMC, 1989). By the early 1950s, forest cover was estimated at 16% and by the 1960s, 7%. Today, the area under closed forest cover is 4.47 million ha, representing approximately 3.6% of total land area, with 9% of the area above 1,500m still covered by closed forest (FAO, 1988; WCMC, 1989). One quarter of the highlands are seriously eroded, another quarter moderately eroded and only 20% are free from the erosion hazard (IUCN, 1986).

Tidal wetlands occur along the coast and include isolated mangrove stands, reed swamps at the mouths of wadis, and extensive salt marshes (Hughes and Hughes, 1991). Mangroves are also found on some of the islands and islets, numbering more than 400, of the Dahlac Archipelago (Ormond, 1978, 1980). Major lakes in the country cover 6,993 sq. km, while there are nine major rivers, the Blue Nile being the most significant (Ashine, 1983). Coral assemblages flourish on some of the outer islands of the Dahlac group, although wanton destruction of the reef resulting from recreational use and littering is prevalent (Berhanu, 1976). It has been recommended that detailed ecological surveys of the area be conducted, Shumma Island be protected, that reefs outside the proposed park receive management, and that coral exploitation and overfishing be prevented (AWLF, 1972; Berhanu, 1976, 1977; Blower, 1971; UNEP/IUCN, 1988). To date, no coastal wetlands are legally protected (Hughes and Hughes, in press).

The possibility of developing national parks emerged from a 1962 Unesco mission (Blower, 1971). Subsequently, surveys were carried out in 1964/1965 in most of the major wildlife areas (Blower, 1971). Arising from these surveys was a proposal to establish Awash, Simen Mountains and the Omo Valley as national parks, with a number of others to follow in due course (Blower, 1971). In 1969, Simen Mountains and Awash national parks were legally gazetted, while the 1960s, 1970s and 1980s saw the declaration of the majority of conservation areas throughout the country (WCMC, 1991). Today, functioning national parks and sanctuaries cover approximately 2.5 million ha or about 2.1% of total land area.

Pursuant to Proclamation No. 192 of 1980, forest areas larger than 80ha were to be declared state forests and to be taken under government control for proper management. This stipulation was not recognised by local or regional administrations and the management of these areas was ineffective. As of 1988, only about 71,200ha of forest land had been demarcated, of which 69,000ha were designated as state forests (FAO, 1988).

Following from the National Programme for the Conservation and Management of Forests, Wildlife, Soils and Water (NP-1986), high priority technical assistance projects were identified in the Tropical Forestry Action Plan for Ethiopia (TFAP) and included the survey, demarcation and preparation of maps and designation of high priority forest areas. Thirty-six priority forest areas covering 3.67 million ha were identified for conservation and production functions. The preparation of management plans for such areas was defined as a major activity, as was the survey and delineation of the boundary of around 4.6 million ha of natural forest (FAO, 1988). Today, a total of 58 national forest priority areas (NFPAs), covering approximately 4 million ha, or 3.3% of the total area of Ethiopia, have been declared (WCMC, 1991; Kidane, pers. comm., 1991).

Certain recommendations to develop the protected areas network are identified in MacKinnon and MacKinnon (1986) and IUCN (1987). These priorities include the gazetting of declared conservation areas; protection of lakes Zwai, Langano, Awasa, Abaya and Chamo; the conservation of sandy beaches for nesting turtles; development of Gambella, Omo, Mago and Nechisar national parks; and the development and implementation of viable management plans for all conservation areas (WWF, 1988). Friis (1989) and Friis and Tadesse (1990) have indicated that the following areas are poorly represented in the current protected areas network: dry montane forest of the plateau and higher altitudes, riverine forest, deciduous woodland of the central Ethiopian plateau, deciduous bushland, semi-desert grassland and scrub, and of particular concern, montane rain forest of south-western Ethiopia. Montane rain forests would receive some protection through the gazetting of Bale Mountains National Park in the south-east, and through the protection of montane forests in Illubabor, Kaffu and Bale provinces (Friis and Tadesse, 1990; MacKinnon and MacKinnon, 1986). The need to support the Plant Genetic Resources Centre of Ethiopia in ecosystem conservation and in the establishment of genetic reserves in high forests and savanna for *in situ* conservation has also been recognised (FAO, 1988).

Initiatives aimed at the development of the protected areas network have been reflected in a number of plans and programmes over the past two decades. Notable among these has been the 1972 Plan for Action and Development of Wildlife Resources, the 1978 Plan for the Conservation and Development of the Wildlife Resources of Socialist Ethiopia, the Ten-year Investment Programme 1980/81-1989/90, the Ten-year Development Plan 1984/85-1994/95, and the Ten-year National Programme (NP-1986). Collectively, their objectives have been, *inter alia*, the establishment of conservation areas, the upgrading in status of wildlife reserves, sanctuaries and controlled hunting areas as and when necessary, the preparation and implementation of management plans in all conservation areas, and the

expansion and development of state forests (Dodds, n.d.; FAO, 1988; Moore, 1982). A target of the NP is the establishment of three new wildlife reserves and the development of eight national parks (FAO, 1988). In review of the NP, the Tropical Forestry Action Plan (TFAP) has recommended the development of three national parks and three wildlife reserves. Further, the EWCO has requested assistance from Wildlife Conservation International and the New York Zoological Society for the preparation of an Action Plan for Wildlife Conservation in Ethiopia which will, *inter alia*, review the present status of the country's conservation areas and make recommendations for their future designation, management and financial requirements (WWF, 1988).

Threats to the protected areas system include: overgrazing and encroachment from nomadic pastoralists; shifting cultivation and permanent agriculture, including cash crop cultivation; human settlements, along with an increased demand and extraction of fuel-wood and building materials within conservation areas; uncontrolled fires; illegal poaching; charcoal burning; illegal fishing; and commercial cutting of wood in reserves such as Bale Mountains National Park (FAO, 1988; Hedberg, 1978; Hillman, 1986b; Hurmi, 1986; Moore, 1982; WCMC, 1989; WWF, 1988). These problems are exacerbated by a rapid population growth, civil unrest and famine in drought-stricken areas (Hurmi, 1986; WWF, 1988).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Wildlife Conservation Regulations

Date: 19 January 1972, last amended 1974

Brief description: Regulates hunting activities, allows for the creation of a Wildlife Conservation Organisation and sets out provisions for protected areas.

Administrative authority: Ethiopian Wildlife Conservation Organisation (Manager)

Designations:

Conservation Area

Areas set aside for the conservation and management of wildlife.

National park Conservation areas which may incorporate land or land covered by sea or other water.

Areas set aside for the purpose of conserving and protecting wildlife and objects of aesthetic, ecological and scientific interest.

Prohibited activities include hunting, cultivating, grazing cattle or livestock, felling trees, burning vegetation, residing in, or exploiting natural

resources in any manner unless these activities are for the development and management of the park.

Game reserve Persons are prohibited from residing in game reserves without written authority from the general manager, excepting public officers on duty and persons who were resident before the date of declaration.

Persons authorised to reside in game reserves have the right to cultivate their land and to pasture and water domestic animals therein.

Prohibited activities include; possession of firearms or the hunting of animals, unless acting in accordance with the conditions of a game capture permit, or with written permission of the general manager or a game warden.

Sanctuary Prohibited activities include grazing of cattle, settling in such areas, and hunting of animals unless acting in accordance with the conditions of a permit, or with written permission of the general manager or a game warden.

Controlled hunting area Prohibited activities include grazing of cattle, settling in such areas and the hunting of animals unless acting in accordance with the conditions of a permit.

Source: Original legislation

Title: The Forest and Wildlife Conservation and Development Proclamation No. 192

Date: 5 September 1980

Brief description: To provide for the conservation and development of forest and wildlife resources

Administrative authority: Ethiopian Wildlife Conservation Organisation (General Manager), Natural Resources Conservation and Development Main Department (NRCDMD) (Vice Minister)

Designations:

Forest

Areas that were formerly classified as state forest, private forest, and protective forest under earlier proclamations.

Areas under the jurisdiction of the state, peasant associations and urban dwellers associations.

State forest Areas which are protected from fire and other natural hazards.

Prohibited activities include taking up residence, hunting wild animals; felling of trees or the collecting, loading or transporting of any state forest product, grazing of cattle, removal of any natural resource, or committing any act detrimental to such areas without written permission from the authority.

Permission is not required for taking, using or selling fallen branches, leaves, barks, or to set up beehives, and harvest honey in such forests.

Protective forest Areas set aside for purposes of soil conservation, flood control, protection of sandhills and sea-shores from sea erosion or the spreading of sands, and for the conservation and improvement of the water regime.

Kebele forest Meaning any forest owned by Kebele peasant associations or urban dweller's associations, or areas so designated by the Forest and Wildlife Conservation and Development Authority.

Such areas are to be developed and conserved through the planting of trees and each peasant or urban dweller's association shall implement directives issued by the authority regarding the conservation, protection, development and utilisation of forests.

Selling of forest products by the peasant or urban dweller's association is prohibited without permission from the authority.

Permission is not required for taking, selling or using fallen branches, leaves and barks, or to set up beehives and harvest honey in such areas.

National park Areas where such activities as settlement, grazing cattle, removing any natural resources, or committing any other act detrimental to such areas is prohibited without written permission from the authority.

Wildlife reserve, Controlled hunting area and Sanctuary Activities such as settling, grazing cattle, removing any natural resource, or committing any other act detrimental to such areas is prohibited without written permission from the authority.

Source: Original legislation

N.B. In practice, sanctuaries and national parks are managed in the same way. Only hunting is controlled in wildlife reserves and controlled hunting areas, and within these two categories, all other land-use activities are permitted. Wildlife reserves act as buffer areas for national parks and sanctuaries, with the possibility of being upgraded at a later date (Hillman, pers. comm., 1991).

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Abijatta-Shalla Lakes	II	88,700	1970
2	Awash	II	75,600	1966
3	Bale Mountains	II	247,100	1969
4	Mago	II	216,200	1978
5	Nechisar	II	51,400	1973
6	Omo	II	406,800	1966
7	Simen Mountains	II	17,900	1966
8	Yangudi Rassa	II	473,100	1976
	<i>Sanctuaries</i>			
9	Babile Elephant	II	698,200	1970
10	Senkelle Swayne's Hartebeest	II	5,400	1972
11	Yabello	II	253,700	1985
	<i>World Heritage Site</i>			
	Simen National Park	X	22,000	1978

Category VIII forest reserves are not listed nor mapped.



Protected Areas of Ethiopia

GABON

Area 267,670 sq. km

Population 1.2 million (1990)

Natural increase: 2.2% per annum

Economic Indicators

GDP: US\$ 4,080 (1987)

GNP: US\$ 2,970 (1988)

Policy and Legislation Gabon obtained internal autonomy from French Equatorial Africa, of which it formed part, in November 1958. Full independence was gained in 1960 (laws of June 1960, November 1962, April 1971, July 1982, March 1987), although close economic and political links with France have since been maintained (McShane and McShane-Caluzi, 1990).

Prior to 1982, Gabonese forest law had become progressively more complicated and difficult to apply. This was resolved by the promulgation in 1982 of a new Forest Law No. 1/82/PR (see Annex), which covers the forest domain. The forest domain comprises state classified forests and state protected forests, which in effect cover the whole country. State classified forests form part of the public domain, are classified and have precise boundaries. Within this category there are eight subdivisions: permanent production forests; reforestation areas, "parcs nationaux vocation forestière"; protection forests; recreation forests; botanic gardens; arboreta and sanctuaries and, finally, wildlife management areas (aires d'exploitation rationnelle de faune) (AERF). This last category is further subdivided into: strict nature reserve; sanctuary; national park; faunal reserve; zoological garden and hunting area. Definitions of each of these categories of AERF are given. The definitions do not follow those given in the African Convention (which Gabon has ratified). However, Article No. 55 of the Constitution of the Gabonese Republic states that ratified treaties and agreements are superior in authority to existing and relevant legislation. The Forest Law is still incomplete and awaiting specific decrees. Until that time the Forestry Department continues to apply laws based on texts from Decree Nos 46-1161 of 20 May 1946 (McShane and McShane-Caluzi, 1990).

Classification and declassification within the forest domain is regulated by Decree No. 18/PR/MEFCR of 4 March 1987. Classified forests may be declassified for reasons of public need. The regulation of hunting and wildlife protection is also fixed by Decree No. 18/PR/MEFCR. Under this, hunting within protected areas is limited (McShane and McShane-Caluzi, 1990). Regulations concerning rights of customary use are given in Decree No. 000/92/PR/MECCR of 4 May 1987 (IUCN, n.d.).

Administration of the forest domain by the Ministry of Water and Forests is provided for by Decree

No. 01746/PR/MEF. Under Law No. 1/82/PR, which also provides for the administration of protected areas, administration of natural reserves is vested in the Department of Fauna and Hunting (Direction de la Faune et de la Chasse). Management of tourism within protected areas is the responsibility of the Ministry of Tourism. Since 1981, hunting has been officially suspended, except within Wonga-Wongué Presidential Reserve. Operation of the reserve is provided for by Decree No. 00882/PR of 14 July 1972 (IUCN, n.d.; McShane and McShane-Caluzi, 1990; Nicoll and Langrand, 1986).

Legislation concerning the forests, fauna and flora is reviewed in an IUCN report on Central Africa (IUCN, n.d.). The forest legislation of Gabon is reviewed in an FAO forestry paper (Schmithüsen, 1986) and in IUCN (1990). An IUCN/WWF report reviews legislation concerning the protected areas (Nicoll and Langrand, 1986).

International Activities Gabon became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 30 December 1986, although to date no sites have been inscribed. One site has been accepted as a biosphere reserve under the Unesco Man and the Biosphere (MAB) programme. The country became party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) on 30 December 1986, under which three sites have been inscribed. Under Law No. 25/87 of 29 July 1987, Gabon became a signatory to the 1968 (Algiers) African Convention of Nature and Natural Resources, which provides definitions of strict nature reserves, national parks and special reserves.

Administration and Management Duties of the Ministry of Water and Forests, in collaboration with other relevant ministerial departments, include, amongst other things, the constitution, delimitation, conservation, management, reforestation and exploitation of the forest domain, seas, lakes and rivers of the state. In particular, it is responsible for the study, classification and surveillance of national parks, and all forms of natural reserve.

The Ministry comprises the Ministerial Cabinet, the General Directorate and dependent establishments and societies. The General Directorate of Water and Forests comprises 11 departments within the central services, the responsibilities of each being described in detail in the decree establishing the directorate. Departments with responsibilities relating to the management of protected areas include: Forest Production; Forest Inventories and Management; and Fauna and Hunting. The Department of Forest Production is responsible for developing general directives for forest management and for

implementing these plans. The Department of Forest Inventories and Management comprises an inventory section and a management section. The latter section is responsible, amongst other things, for proposing management objectives and rates of exploitation of forests and their reforestation. The Department of Fauna and Hunting is responsible, amongst other things, for developing and putting into practice general directives concerning the management and conservation of the fauna, and for implementing management techniques for the management of hunting activities. It comprises a faunal management section, hunting section and two faunal brigades. The faunal management section is responsible for: delimiting areas for rational exploitation of the fauna; managing parks and reserves; proposing the classification of faunal reserves and national parks and documenting the fauna. Reorganisation of the General Directorate of Waters and Forests is planned as part of a World Bank/UNDP forest and environment project, which will reduce the number of departments to three: forest industry; fisheries and wildlife (T.O. McShane, pers comm. 1991). A para-military force of forestry and wildlife staff is directly responsible for managing reserves.

Operation of Wonga-Wongué Presidential Reserve is vested directly under the authority of the Chief of State (McShane and McShane-Caluzi, 1990).

Management of Ipassa Makokou Integral Reserve rests with the Ministry of Scientific Research, and specifically with CENAREST (National Scientific and Technological Centre of Gabon) (T.O. McShane, pers comm. 1991). The Ministry of Tourism (Ministère de tourisme) is responsible for development of tourist infrastructure within protected areas and the promotion of tourism. The police (gendarmerie) and the Wildlife Department are responsible for applying conservation laws (McShane and McShane-Caluzi, 1990).

Under the 1987-1990 development plan, approximately 11% of the Forestry Department's budget (CFA 312 million) was budgeted for forest conservation activities (McShane and McShane-Caluzi, 1990).

Indigenous conservation non-governmental conservation organisations have begun to form following recent political liberalisation (T.O. McShane, pers. comm., 1991). In the mid-1970s an FAO/UNDP project was carried out with the broad aim of improving the management of wildlife resources within the country. The principal objectives were: evaluation of the information available on natural resources; study of the relevant legislation and administrations; and study and evaluation of the existing system of protected areas, with the aim of improving management, administration and legislation. The World Wide Fund for Nature (WWF) and IUCN The World Conservation Union first became involved in Gabon following a request to IUCN from the Wildlife Department to conduct a review of the protected area system. This was completed in 1986 and followed up by the provision of equipment for Lopé Reserve.

Currently, Gabon is one of the six WWF focal countries in Africa, with eight WWF projects operational (Nos 3254, 3886, 4511, 4618, 6323, 6817, 6943 and a bushmeat economics project yet to have a number) (Nicoll and Langrand, 1986; WWF, 1991; T.O. McShane, pers. comm. 1991).

Under Law No. 82/PR all classified forests require a management plan, which do not, however, exist yet (McShane and McShane-Caluzi, 1990). Management and protection of protected areas varies, but is generally low. An exception is Wonga-Wongué Presidential Reserve, which is relatively well protected. Although a number of exotic species have been introduced, the reserve is well protected from poachers and access is strictly limited to Presidential hunting parties. Ipassa-Makokou enjoys no special protection and the lack of effective management has resulted in such a serious threat from hunting and logging that the reserve is now included on the IUCN Commission on National Parks and Protected Areas (CNPPA) List of Threatened Protected Areas of the World. The wildlife department has built camps at Lopé and Moukalaba reserves, but Setté Cama is not staffed. The oil company Shell Gabon has a base within the reserve (de Bie and Geerling, 1989; Blom, Alers and Barnes, 1990; Tutin and Fernandez, 1987). Logging is currently permitted in protected areas despite the fact that laws totally protect flora as well as fauna within reserves (McShane and McShane-Caluzi, 1990).

Although Gabon is relatively affluent, the recent drop in oil prices has had dramatic consequences and resulted in drastic decreases in the national budget. The Department of Fauna and Hunting has suffered greatly, especially from a lack of adequate equipment to enable it to run efficiently.

Systems Reviews Gabon has an 800km coast with the Atlantic Ocean and comprises most of the drainage basin of the Ogooué River, together with the basins of several smaller rivers. Geomorphologically, the country can be divided into two zones: the sedimentary basin along the coast and the uplands of the interior. The sedimentary basin is a low-lying rather flat 50-150km wide coastal zone containing massive sandy deposits. Long-shore drift deflects river mouths northwards, behind sandy spits. The cretaceous sedimentary rocks underlying the entire area yield oil at shallow depths. The interior uplands consist mainly of plateau surfaces of 450m to 600m, dissected by the Ogooué River system into distinct blocks. The plateau surface is broken by the Monts de Cristal in the north and the Massif du Chaillu in the south. The highest mountains are just over 1,000m. In places the Precambrian matrix has been covered by sediments of later geological eras. The soils of the sedimentary basin are predominantly yellowish silty sands and sandy clays on high ground, and white leached sands in marshy areas and river beds. The soils in the interior uplands are yellowish to red and of a clayish texture except on the Batéké Plateau in the extreme south-east. Most of the clay soils can be classified as

feralsols and are rich in kaolinite (Hughes and Hughes, 1986; McShane, 1988, 1990).

Gabon lies entirely within the Guineo-Congolian regional centre of endemism, and is the most biologically diverse region in the continent. The rain forests, which comprise an estimated 8,000 species of plants, cover about 85% of the country. In 1986, undisturbed Guineo-Congolian rain forest still covered more than one-third of the country, largely in the eastern region. Differences in the tropical forest structure are primarily based upon rainfall distribution and geographic barriers such as rivers and mountains. In the north-east of the country the mountains are covered, between 950-1,000m, with a type of vegetation known as "elfin thicket" found nowhere else in Africa. The remaining area, mostly in the south-east and south-west, is largely savanna, which is thought to be a climatic remnant from a drier past. Only some savanna strips parallel to the coast seem to be in a stage of natural succession between bare sand dune and forest. Gallery forests occur throughout the savanna areas. Tidal mangrove forests occur in all estuaries, bays and lagoons along the coast. The total area of tidal forest, in its broadest sense, is probably in excess of 350,000ha. Numerous shallow lakes, fringed by extensive swamps, occur on the coastal plain. There are other deeper lakes at the lower ends of valleys where the Ogooué traverses the coastal range. In addition, extensive swamp forests occur in the north-east and lower parts of the Ogooué basin, as well as swamps for almost the entire course of the river (Davis *et al.*, 1986; Hughes and Hughes, 1991; McShane, 1988, 1990; Nicoll and Langrand, 1986).

Gabon is one of the few countries in the world that still offers exceptional potential for conservation. Along with adjacent areas of Cameroon and Congo, Gabon forms what is probably the largest intact forest block remaining in Africa (WWF, 1991). In general, the major ecosystems remain intact. The forests near the coast are the most densely populated and therefore the least well preserved (IUCN, n.d.). Although many areas of forest have been exploited to varying extents for either timber or shifting cultivation, large tracts of forest still remain untouched, and the general opinion seems to be that forest degradation will not be as drastic as in many other tropical countries (McShane and McShane-Caluzi, 1990). Forest exploitation is highly selective, 90% of trees cut being of one species, okoumé *Aucomea klaineana*, an important species for use as plywood and veneer (Tuijn and Fernandez, 1987). The ecological impact of shifting cultivation is not serious as population density is very low. As people have become more sedentary, human activities have had less influence on the forest. As a result, secondary forests are found in remote, presently uninhabited places (McShane and McShane-Caluzi, 1990).

The country lacks a strong agricultural tradition (hunting and gathering provided the main means of subsistence for forest people in pre-colonial times) and contributed about 8% of GDP in 1986. Principal traditional crops are

cassava, taro, yam, plantain, rice, maize and peanuts, most of which are consumed locally (Nicoll and Langrand, 1986). Land area devoted to cash crop agriculture is, however, increasing. The country's agricultural policy, as defined in the development plan (1988-1990), calls for increased investment in this sector. Cash crop agriculture covers 13,000ha in the forest zone, and includes oil palm, rubber, cocoa and coffee. Products grown in the savannas include sugar cane, pineapple and various fruits and vegetable (McShane and McShane-Caluzi, 1990; Nicoll and Langrand, 1986).

The protected area system had its beginnings in 1946 with the creation of Lopé-Okanda Reserve by the administration of French Equatorial Africa (of which Gabon was then part). Since then, administration of the reserve has been modified by a number of different laws and the protected area system expanded by the government. The protected areas system (excluding forest reserves) currently comprises 10 reserves which cover just over 6% of the country. Several of the reserves have yet to be implemented.

Additional areas in need of protection include primary forest north and south of the Ogooué. Gabon is considered to have adequate resources to manage its natural environment; however, sufficient commitment to this task has reportedly been lacking in the past (IUCN, 1983).

In 1986 IUCN and WWF provided consultants to conduct a review of the protected areas system, with the long-term objectives of promoting the establishment and management of these areas. In addition to reviewing the areas currently protected, the report also outlined a management plan for Lopé Reserve. Recommendations are given to improve the management of existing reserves and for the establishment of a new protected area system in the north-east (Nicoll and Langrand, 1986). An IUCN report on the conservation of forest ecosystems in central Africa includes recommendations for the whole region, as well as those specific to Gabon. These latter recommendations cover changes in the legislation and the utilisation and conservation of forests, in particular the development of buffer zones around protected areas, reinforcement of the fauna and hunting service, controlling hunting and the creation of a quasi-autonomous institution, following the model of the IZCN in Zaïre (IUCN, 1989). The comprehensive review of Gabon by McShane and McShane-Caluzi (1990) contains numerous proposals to improve environmental management including the protected area system. Chief among these are: the establishment of a network of reserves to cover the different types of forest ecosystem; improved management of existing sites; legislation to bring definitions of protected areas into line with those given in the Africa Convention; training of personnel responsible for conservation in forest areas as well as in the existing savanna-based school and increasing general awareness of the importance of the forests.

Proposals to improve the protected areas system are also given by MacKinnon and MacKinnon (1986) and IUCN (1987). In an ecological study for oilfield development, de Bie and Geerling (1989) propose the establishment of the coastal Rabi area as a national park. Under Gabonese law oil and gas exploration would be allowed. They also propose integration of the area with the existing Sette Cama faunal reserve and hunting domain.

Forests and wildlife have generally been protected from excessive exploitation because vast mineral resources, including petroleum and natural gas, manganese and uranium, have provided the income necessary to drive the economy. However, poaching throughout the country appears to be on the increase following a crash in oil prices, and although commercial hunting of elephants has been limited in relation to the rest of Africa, there are indications that this could change as there is little government control over wildlife product movements. Experience in other countries, such as the Central African Republic and Zaïre, has shown that once organised poaching gets going, it can quickly decimate the elephant population (McShane and McShane-Caluzi, 1990). The construction of a railway from Libreville to Franceville has opened up the forest to selective logging, threatening Lopé Reserve in particular. Transport costs previously were prohibitive. In 1986 two logging companies were working permits in the reserve, despite theoretical total protection of this area by the law. Although logging is highly selective it is nevertheless significant, particularly in the Lopé region (T.O. McShane, pers. comm. 1991; Tutin and Fernandez, 1987).

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ANNEX

**Definitions of protected area designations, as legislated,
together with authorities responsible for their administration**

Title: Loi No. 1/82 d'Orientation en Matière des Eaux et Forêts (concerning water and forests)

Date: 22 July 1982

Brief description: Provides, *inter alia*, definitions of land within the forest domain.

Administrative authority: Ministère des Eaux et Forêts (Ministry of Water and Forests)

Designations:

Forêt domaniale protégée (Protected forest domain) Non-defined forests forming part of the private domain.

Forêt domaniale classée (Classified forest domain)

Classified forests with fixed uses.

Part of the public domain.

To be demarcated as soon as possible after classification.

Categories comprise:

- *Forêt de production à vocation permanente (Permanent production forest)*
- *Périmètre de reboisement (Reforestation zone)*
- *Parc national à vocation forestière (National park that includes forestry)*
- *Forêt de protection (Protection forest)*
- *Forêt récréative (Recreation forest)*
- *Jardin botanique (Botanic garden)*
- *Arboretum et sanctuaire de certains espèces végétales (Arboretum and sanctuary for certain plant species)*

Aire d'exploitation rationnelle de faune (Wildlife Management Area)

A general category comprising:

- *strict nature reserve*
- *sanctuary*
- *national park*
- *wildlife reserve*
- *zoological garden*
- *hunting area*

Granting of concessions within these areas is prohibited. Exploitation of tourist activities within national parks and hunting areas is authorised,

according to regulations. Management of fauna and hunting is the responsibility of the administration in charge of water and forests. Administration responsible for tourism is charged with the exploitation of tourism in national parks and hunting reserves. Areas are subject to management plans to be established by the Water and Forests administration. Activities prohibited include: creation of villages, camps, public or private routes; any exploitation liable to modify the environment and resources; entry without prior administration from the Water and Forests agents; hunting, other than in hunting areas; movement and parking outside marked out paths; military manoeuvres; pollution of water sources; grazing of domestic animals; camping or staying overnight; flying at low altitude and customary usage.

Réserve naturelle intégrale (Strict nature reserve) For the total protection of soil, water, flora and fauna, in which access is only permitted to agents of the Water and Forests Service and research workers.

Sanctuaire (Sanctuary) For the total protection of named species of plants or animals; access is regulated.

Parc national (National park) An area where flora, fauna, geomorphological, historical sites of geomorphological, historical and other forms of landscape enjoy special protection in which tourism is authorised and regulated.

Réserve de faune (Wildlife reserve) An area in which flora and fauna are totally protected, in which access is regulated

Jardin zoologique (Zoological garden) A public or private institution characterised by the exhibition of living animals or rare species. For recreational, aesthetic, cultural or reasons for repopulation purposes.

Domaine de chasse (Hunting area) An area where hunting is controlled and slaughter is restricted. Tourism is authorised and regulated

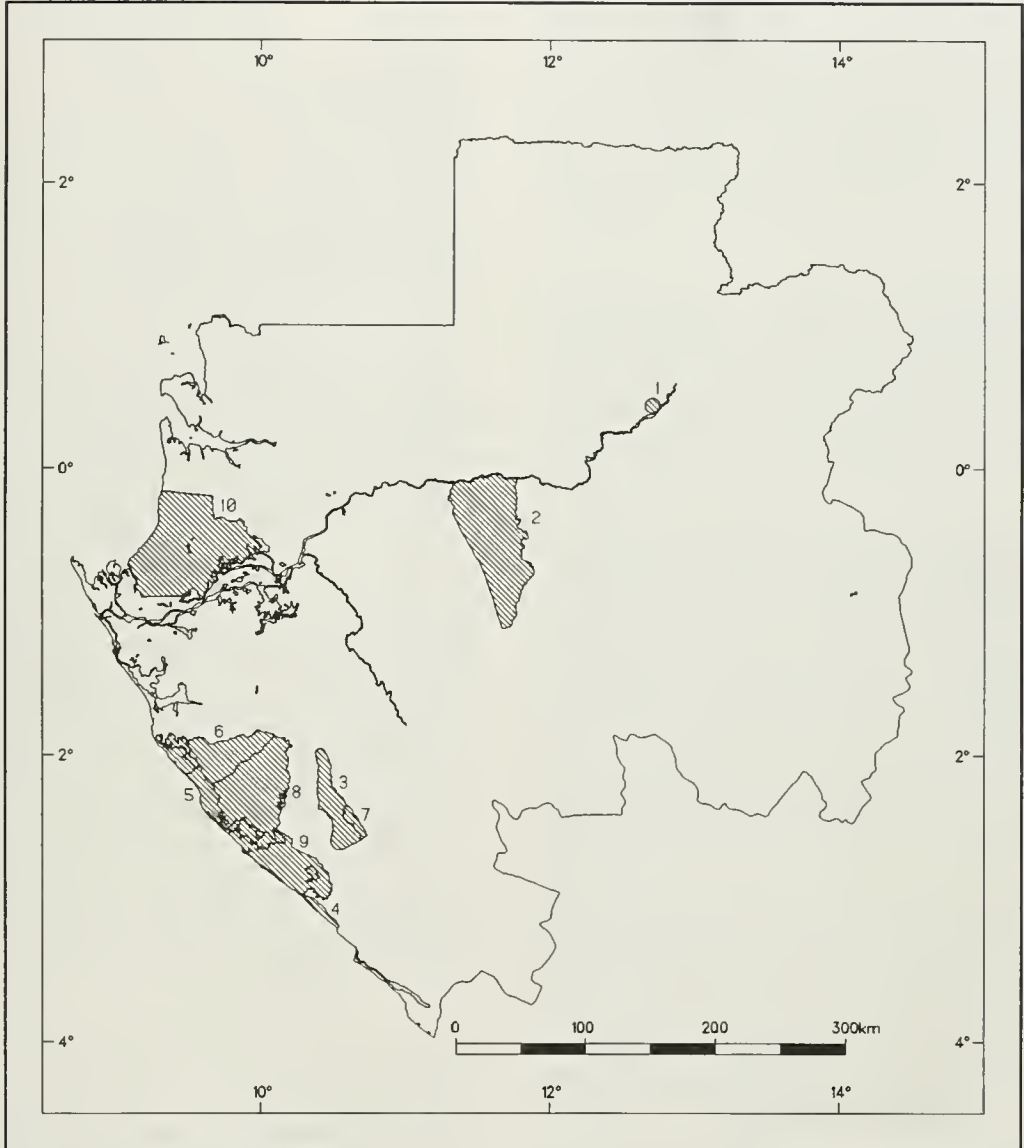
Zone protégée d'exploitation de la faune (Protected zone for wildlife exploitation)

Comprises the remainder of the national territory. Within this area, (other than in classified forests (forêts domaniales classées)) hunting is authorised and regulated.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	<i>Strict Nature Reserve</i> Ipassa-Makokou	I	15,000	1970
	<i>Faunal Reserves</i>			
2	Lope	IV	500,000	1962
3	Moukalaba-Dougoua	IV	80,000	1962
4	Ouanga Plain	IV	20,000	1966
5	Petit Loango	IV	50,000	1066
	<i>Hunting Reserve</i>			
6	Iguela	VIII	180,000	1962
7	Moukalaba	VIII	20,000	1962
8	Ngove-Ndogo	VIII	250,000	1962
9	Sette-Cama	VIII	200,000	1962
	<i>Presidential Reserve</i>			
10	Wonga-Wongue	IV	380,000	1971
	<i>Biosphere Reserve</i>			
	Réserve naturelle intégrale d'Ipassa-Makokou	IX	15,000	1983
	<i>Ramsar Wetlands</i>			
	Petit Loango	R	480,000	1986
	Sette Cama	R	220,000	1986
	Wongha-Wonghe	R	380,000	1986



Protected Areas of Gabon

THE GAMBIA

Area 11,300 sq. km

Population 0.9 million (1990)

Natural increase: 2.6% per annum

Economic Indicators

GDP: US\$ 261 per capita (1987)

GNP: US\$ 220 per capita (1988)

Policy and Legislation Under the Banjul Declaration of 18 February 1977, the government's commitment to the conservation of flora and fauna was stated. The "Five-year plan for economic and social development, 1975/76-1979/80" established environmental policy. Activities defined to implement this policy include the strengthening of existing environmental control legislation, programmes for the conservation of forests and other natural resources, and the creation of a new national parks service (Corson and Kux, 1981). Objectives of the present forestry policy are, *inter alia*: to reserve and maintain a national forest resource capable of protecting natural ecosystems and providing for an adequate supply of wood and other forest products for the rural population; to maintain a Forestry Service staffed with trained personnel to administer the forest resources; and to foster conservation awareness amongst the Gambian people (Edens, 1991).

The Wildlife Conservation Act, assented to by the President on 14 February 1977, repealed the Wild Animals (Birds and Fish) Preservation Act, 1916, but keeps in force subsidiary legislation under this earlier Act. The 1977 Act, known as the "principal act", provides for the conservation and rational management of wildlife, for the establishment of national parks, national reserves and local sanctuaries (Annex), and for the creation of a Department of Wildlife Conservation. The Act sets out the procedure for the creation and degazettement of protected areas, and empowers the Director of the Wildlife Conservation Department to control hunting in areas adjacent to national parks and reserves. The Wildlife Conservation Regulations (Legal Notice No. 36), 1978 outline regulations and rules applicable to all national parks and reserves.

The Protectorate Lands Ordinance (Cap 125) of 1 January 1955 made provision for the tenure and management of protectorate lands in The Gambia, and allowed for the creation of forest parks (Annex). In addition, the Ordinance stipulated prohibited activities and accompanying penalties within forest parks, and the procedure involved in the creation and degazettement of such areas. By virtue of this Ordinance, the Governor was empowered to make regulations for the protection, control and management of any forest park and to make regulations for areas outside such parks. Head chiefs, sub-chiefs and headmen of districts, sub-districts, towns and villages are responsible for protecting land under their jurisdiction from the ravages of bush or forest fires.

The Forest Act No. 9, assented to by the President on 25 February 1977, provides for the establishment of forest parks, protected forests and wind erosion areas, and stipulates that all existing forest parks are deemed to have been designated under and in accordance with the provisions of this act (Annex). The Act also sets out: the powers and responsibilities of the Minister, Conservator and supporting forestry officers; the disposal of fees and royalties; the instatement of a reserve settlement officer, who is responsible for inquiring into and determining land rights in connection with the establishment of forest parks; and offences and accompanying penalties in association with the Act. The Provinces Land Regulations of 1952 were revoked with the passing of the 1977 Act.

There are a number of shortcomings with protected areas policy and legislation. It has been recognised that parks protection, land tenure and fire management are key policy areas which need to be considered in the negotiation of local development initiatives (Karch *et al.*, 1989). To this end, some changes in resource use policy and enforcement of existing legislation is required (Karch *et al.*, 1989).

International Activities The Gambia is party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), which it ratified on 1 July 1987. To date, no sites have been listed under this Convention. The Gambia is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, The Gambia has ratified the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The Ministry of Natural Resources and the Environment (MNRE) has overall responsibility for environmental matters within the country and is charged with coordinating the National Environmental Plan. (Edens, 1991). The estimated expenditure of the MNRE in 1990/91 was expected to be 7,354,490 D, with the Department of Wildlife Conservation being 370,820 D, and the Forestry Department being 1,708,200 D (Edens, 1991).

The Department of Wildlife Conservation, within the Ministry of Natural Resources and the Environment (MNRE), is responsible for managing national parks, national reserves and local sanctuaries. The Department, which was formed in 1977, comprises a Director of Wildlife Conservation, a warden, conservation assistants and a number of other support staff.

A small Forestry Division was first established in 1950 with responsibility for managing the forests of The

Gambia (Corson and Kux, 1981). This responsibility was subsequently turned over to the area councils, with the mandate being returned to the Forestry Department in the 1970s. The Forestry Department, formerly within the Ministry of Water Resources, Forestry and Fisheries, and now within the MNRE, has responsibility, *inter alia*, for forestry administration and for managing forest parks. The head office of the Department is in Banjul, with representation in all divisions of the country: the Department fulfils its official role in the divisions through the Divisional Licensing Committee (Edens, 1991). As of 1990, the total Forestry Department staff was 170, only 4 of which were professionals. The Department of Agricultural Services, within the Ministry of Agriculture, is responsible for soil conservation and the protection of water catchments (Stuart and Adams, 1990).

There are a number of constraints to protected areas management: a lack of adequately trained staff to implement environmental programmes; and, within the departments of Forestry and Wildlife Conservation, institutional incentives are not strong enough to encourage staff to perform their management tasks (Corson and Kux, 1981; Karch *et al.*, 1989). Insufficient funds, together with a lack of transportation and basic communication equipment, have hampered efforts of the Forestry Department in the enforcement of regulations, and in the patrol and management of forest parks (Edens, 1991). Recommendations have included the transformation of the Forestry Department into a parastatal unit. With an appropriate charter, this could improve the operational flexibility of the organisation (Edens, 1991).

Systems Reviews The Gambia, situated on the west coast of Africa, is entirely enclosed by Senegal. The Gambia River extends through the middle of its east-west length. The country is 315km long (east-west), has a maximum width of 45km (north-south), and does not exceed 100m (Hughes and Hughes, 1991). The biogeographic affinities are Sudanian in the east, with Guinea-Congolian/Sudanian regional transition zone in the west (Stuart and Adams, 1990). The forests comprise Sudanian woodland, wooded savanna and bush fallow, mangroves and island relics of closed forest in the moister western part (Corson and Kux, 1981; Davis *et al.*, 1986; Starin, 1989). Most of the forests have been modified by fire, grazing, uncontrolled exploitation or cultivation (Corson and Kux, 1981). Consequently, the remaining closed forest cover (34% of the country) is being quickly converted into tree and shrub savanna (Starin, 1989). As of 1981, about 45% of the country was under cultivation, much of which was groundnut production (Corson and Kux, 1981). About 70% of the labour force is currently engaged in agriculture (Edens, 1991).

The wetland system consists of tidal (mangrove) swamps, fresh water swamps and marshes in the upper courses of small rivers and beyond the tidal zone in the Gambia River, and river flats or "banto faras" which become seasonally flooded during the rains and are now

extensively used for rice cultivation (Corson and Kux, 1981). Mangroves are found in estuaries and coastal lagoons, on the lower courses of small rivers, and extending as a 3-10km wide fringing belt 200km up the Gambia River (Edberg, 1982; Hughes and Hughes, 1991; Ketel *et al.*, 1987; SECA/CML, 1987). Currently, there are an estimated 45,000ha of mangrove swamp in The Gambia (Hughes and Hughes, 1991). Intensive agriculture and the destruction of natural riverine wetlands has caused increased erosion and siltation on the upper sections of the Gambia River. This has necessitated dredging operations in order to keep the river channel open (Hughes and Hughes, 1991). Proposals to create a salinity barrage on the river, 170km inland from Banjul, have raised further concerns about the impact on mangroves from excessive flooding upstream of the dam. Currently, Niimi/Sine Saloum National Park and Kiang West National Park protect a portion of the mangrove ecosystem (Hughes and Hughes, 1991; E. Brewer, pers. comm., 1985;).

The beginnings of the protected area system dates back to 1916 when the main part of Abuko Nature Reserve was protected as a water catchment area. Abuko was given nature reserve status in 1968 and extended by about 29ha to its current size in 1978 (Edberg, 1982). In that same year, River Gambia National Park was created, while the other two protected areas under the authority of the Department of Wildlife Conservation, namely Niimi/Sine Saloum and Kiang West national parks, were designated in 1987. In total, these conservation areas account for 1.6% of the area of the country, and a further two conservation areas have recently been proposed. In 1955, 66 forest parks were created totalling 34,029ha, 3.0% of the total area of the country (Corson and Kux, 1981; Starin, 1989; WCMC, 1991). Thirty-four of these forest parks, occupying an area of 22,239ha, were set aside for protection purposes, whereby burning and cutting of vegetation is prohibited except by permit (Corson and Kux, 1981).

A number of programmes and projects have been initiated over the past two decades. From 1979 till 1986, US-AID supported the Gambia Forestry Project, a component of which was to train local staff. Since 1979, GTZ has been active in forestry, with activities including a forest inventory in 1980, and the fencing of two forest parks to protect them from encroachment (Edens, 1991). Under the current Gambia Natural Resource Management Action Programme, proposed strategies include national park woodlot management and an adherence by farmer groups to management plans to conserve soil and water, improve tree composition and enhance forage availability on 100,000ha of the 452,646ha of forest lands in the country (Karch *et al.*, 1989). The overall goal of this programme is sustainable development of natural resources.

In 1990, the government made a formal request for assistance in forestry planning: this in the form of a Tropical Forestry Action Programme (TFAP) (Edens, 1991). The major focus of this programme will be on

ways of stopping further degradation of the vegetative cover in the country. To achieve this, the major objectives of the TFAP are, *inter alia*: to assist the Ministry of Natural Resources and the Environment (MNRE) to formulate an appropriate policy for the forestry sector; to strengthen the planning capacity of the Forestry Department; and to translate national policies and plans into action (Edens, 1991). A new forest inventory will support these goals, and it is likely that the National Forestry Action Plan will be part of the National Environmental Plan (Edens, 1991). It has been recognised that the emphasis of the forestry programme should be directed towards forestry in land use, whereby the goals of ecosystem preservation and material support for local communities are both taken into account.

Certain recommendations for action have been outlined in MacKinnon and MacKinnon (1986), IUCN (1987), and Stuart and Adams (1990). A priority is continued cooperation with Senegal to protect the resources of the Delta du Saloum, a valuable mangrove and important wetland area for breeding waterbirds. Other proposals include extended protection of mangrove swamps bordering the river, and the use of forest parks to form the basis of a conservation system that would allow for the conservation of habitats and ensure the survival of the country's extant terrestrial fauna (Corson and Kux, 1981; Parker, 1973; Starin, 1989). Forest parks, as potential wildlife conservation units, would allow for conservation and the socio-economic development of local communities while not depriving people of further land needed for agricultural activities (Parker, 1973; Starin, 1989).

Threats to the integrity of the protected areas system include: high human population density and growth rate accompanied by an ever-increasing demand for agricultural land, fuel wood and other forest products; annual bushfires; and uncontrolled grazing by livestock (Corson and Kux, 1981; Starin, 1989). In the forest parks alone, 11% of total land area had been cleared by 1972 (Corson and Kux, 1981). This problem has been exacerbated because habitat protection has not been a priority of the Forestry Department (Starin, 1989). Poaching and agricultural encroachment are particular threats to national parks (Edberg, 1982).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Protectorate Lands Ordinance (Cap 125)

Date: 1 January 1955

Brief description: Makes provision for management of lands in the protectorate and for the creation of forest parks

Administrative authority: Forestry Department (Director)

Designations:

Forest park The Governor, by notice published in the gazette, and with consent of the district authorities, may declare any protectorate land to be a forest park.

Prohibited activities include cutting, felling, burning, uprooting, injuring or removing any tree, pole, sapling or bamboo; the removal of dead wood and the extraction of palm wine, palm nuts, palm kernels for sale; the collection of any fibre, rubber or gum; the lighting of fires; the clearing or cultivation of land; the erection of buildings or enclosures; and the quarrying or collection of gravel or sand without a permit granted by the appropriate Licensing Officer.

Prohibited activities on land outside forest parks include: the cutting, felling, burning, uprooting, injuring or removal of any protected tree; the cutting of firewood; the collection of any fibre, rubber, palm nuts, palm kernels or gum, or the conversion of wood to charcoal for the purposes of sale; the extraction or collection of palm wine; and the quarrying or collection of gravel or sand, except under permit.

Source: Original legislation

Title: The Forest Act (No. 9)

Date: 25 February 1977

Brief description: Makes provision for the management of forest resources, the designation of forest parks and the declaration of protected forests

Administrative authority: Forestry Department (Director)

Designations:

Forest park The following lands may be designated as forest parks by the Minister: lands at the disposal of the government; any lands where it appears that forest growth on such lands should be protected or reserved, or where forest growth should be established. Any such lands may be declared by the

Minister to be "protected forest" by notice published in the *Gazette*.

After reviewing the findings of the reserve settlement officer and in considering the opinion of the Conservator of Forests, the Minister may publish a notice in the *Gazette* proposing the establishment of a forest park and the rights admitted therein. After the time for appeal has elapsed, the Minister may make an order, published in the *Gazette*, designating the specified area to be a forest park. The Minister is empowered to dereserve the whole or part thereof of a forest park by notice in the *Gazette*. The protection, control and management of forest parks and protected forests shall be exercised and directed by the Minister.

Except with written authority, prohibited activities in such areas include: taking of forest produce; uprooting, burning or otherwise damaging any tree; setting fire to any vegetation within an area which, or at a time when such activity is prohibited; pasturing or trespassing of cattle; digging, cutting or cultivating the soil, or making a farm or plantation; constructing any dam or otherwise obstructing the channel of any river or stream; residing in or erecting any building; hunting or fishing; and damaging or destroying any forest property.

Wind erosion areas The Minister, by notice published in the *Gazette*, may declare such areas for the purposes of: the formation of windbreaks; the retention of trees; the planting of trees; and for the purposes of preventing wind-erosion.

Source: Original legislation

Title: Wildlife Conservation Act (Act No. 1)

Date: 3 February 1977

Brief description: Provides for the conservation and management of wildlife and the establishment of protected areas

Administrative authority: Department of Wildlife Conservation (Director)

Designations:

National park Areas which are declared by the Minister after approval of Parliament.

Areas set aside for enjoyment of the public, for the propagation, protection, conservation and management of vegetation and wild animals, and for geological formations of scientific or aesthetic value.

Strictly controlled or prohibited activities include those which are disruptive to wildlife.

National reserve Areas which can be established directly by the Minister.

Areas set aside for propagation, protection, conservation and management of vegetation or wild animals.

Hunting and certain other human activities are prohibited.

Local sanctuary Areas which can be established directly by the Minister.

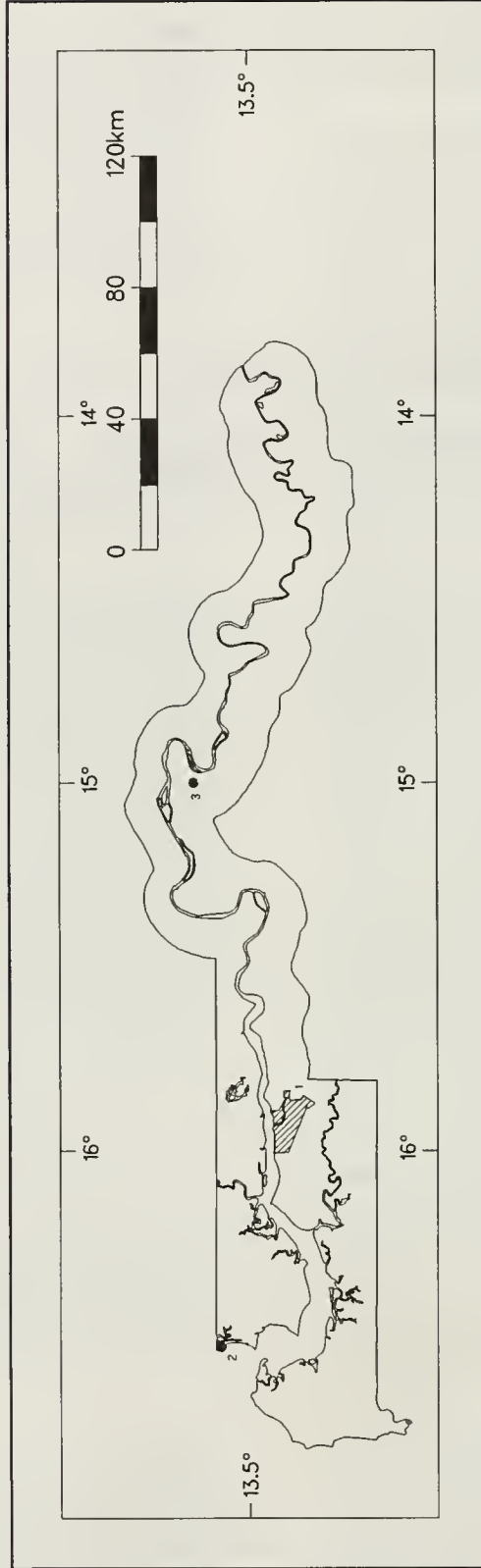
Areas set aside to protect particular plants, animals or communities.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map ref.	<i>National/international designations</i> Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Kiang West	II	11,000	1987
2	Niumi/Sine Saloum	II	4,940	1987
3	River Gambia	II	2,500	1978

Category VIII forest reserves are not listed nor mapped.



Protected Areas of The Gambia

GHANA

Area 238,538 sq. km

Population 15 million (1990)

Natural increase: 3.1% per annum

Economic Indicators

GDP: US\$ 381 per capita (1987)

GNP: US\$ 400 per capita (1988)

Policy and Legislation Conservation of forests and wildlife has a long tradition, which has expressed itself in the creation of indigenous "law" and more comprehensive legislative instruments. Arising from a totemistic belief that people can have a mystical union with plants, animals or natural objects, local practices, customs and taboos have been developed to protect cultural and religious objects or natural areas with particular plant and animal species. The protection of snails in fetish groves in Ashanti Region, Nile crocodile on Katorgor Pond, Paga in Upper East Region and mona, and black and white colobus monkeys at Boabeng-Fiema in the Brong-Ahafo Region, are notable examples. Hunting of these species is prohibited, access and utilisation of their habitats restricted and offences dealt with by the traditional councils (Nuhu, 1986). Further, most of the surviving Southern marginal forest type lies in sacred groves (Hall and Swaine, 1981).

One of the first conservation initiatives was the creation of a number of game reserves by the Forestry Department under the Wild Animals Preservation Ordinance (Cap. 246), 1901. In 1952, the Wild Animals Preservation (Amendment) Ordinance No. 10 was passed, and subsequently revised in 1960, which allowed for the dereservation of a number of game reserves and the extension of game laws (Nuhu, 1986). Shortly thereafter, the 1901 and 1952 Ordinances were repealed with the enactment of the Wild Animals Preservation Act No. 43, 1961, under which the President is empowered to establish reserves. Legislative Instrument 710 of 20 September 1971, repealing the earlier Wild Animals Preservation (Game Reserves) Regulations (L.I. 171), 1962, sets out the wildlife reserves regulations, and provides for the establishment of the first currently recognised reserves, namely Mole, Digya and Bui national parks, Shai Hills Game Production Reserve, Kogyae Strict Nature Reserve and Owabi Wildlife Sanctuary. Legislative Instrument 1283, 1983 deals with penalties for contravention of the 1971 Wildlife Conservation Regulations. In establishing forest reserves and conservation areas, the land must be compulsorily acquired by the government and compensation paid to the owner (Owusu *et al.*, 1989).

Definitions for national park, strict nature reserve and wildlife sanctuary do not appear in either the 1961 Act nor the 1971 Regulations, but are defined and recognised as set out in the Africa Convention of 1968 (Annex). Further, as this Convention makes provision for

countries to create their own special categories of reserve, the definition of game production reserve is set out in the 1974 Wildlife Conservation Policy (Asibey, pers. comm., 1991). New definitions for the various categories have, however been drawn up for incorporation into the 1961 Act (Annex). In practice, both strict nature reserves and wildlife sanctuaries are protected in the same way as national parks. Management objectives have been to plan and systematically open all national parks to recreational (tourism) use, with game production reserves utilised for compatible forms of use that do not have major adverse effects on wildlife (Asibey, pers. comm., 1991).

Under the national Wildlife Conservation Policy of 9 January 1974, the importance of protected areas in conserving "representative samples of the wildlife resource" is emphasised and this is to be supported by research and scientific management. Conservation of wildlife within parks and reserves overrides all other interests and non-compatible uses are not permitted. Culling may be allowed if there is a danger of overstocking or if one animal population threatens the conservation of another. Within the policy, a distinction is made between the function of game production reserves and other protected areas. Non-native animals may be introduced into game production reserves for meat production or sport. Game production reserves may also be used for such compatible purposes as the capture of animals for educational use, research or sale, and logging may be permitted (Department of Game and Wildlife, 1974).

Following World War I, efforts to curb deforestation involved the creation of forest reserves under native authority bye-laws. A forest policy was also adopted with a view to "conserve sufficient areas of forest" to protect the forest ecosystem (Bennuah, 1987). Lack of public support for both measures prompted the Governor of the Gold Coast to pass the Forest Ordinance of 30 March 1927 (Cap. 157). This Ordinance allows for the constitution of forest reserves (Annex), provides for the appointment of a Reserve Settlement Commissioner, and sets out the procedure involved in notification. Ownership of land is not altered by the creation of a forest reserve and it may be managed either by the owner under direction from the Forestry Division or by the Government for the benefit of the owner. The Concessions Act No. 124, 1962 amends these provisions and establishes that all forest reserves are deemed to be vested in the President acting in trust for the customary land owners. It also abolished the creation of forest reserves under local bye-laws (EPC, 1989). By virtue of the Forest Ordinance, the President may, by order published in the *Gazette*, direct that land cease to be considered a forest reserve. The Ordinance also sets out offences and penalties and matters dealing with the management of forest reserves.

The Trees and Timber Decree (NRCD No. 273) of 23 August 1974 deals, *inter alia*, with areas outside forest reserves (Annex). The Forest Reserve Commissioner is able to designate and withdraw areas as protected areas, as well as make regulations which impose duties on persons who hold concessions in such areas, allow for the appointment of forest guards and make provisions for the payment of fees by concessionaires.

The Forest Policy of 1948 encourages the creation of sufficient permanent forest resources by reservation of appropriate areas of forest or land suitable for afforestation, allows for the protection of wildlife, and recognises the damage which unregulated and unplanned mining of forest resources can bring to the ecology and environment (Bennuah, 1987; World Bank, 1988). The draft national forest policy (1989) focuses on the overall management of the forest estate to ensure sustainability of forest resources and environmental conservation. Key provisions include: protection of soil and water resources; protection of water catchment areas; conservation of flora and fauna; control of desertification; and controlled exploitation of forest resources based on the principles of sustainable yields, environmental conservation, and enhancement of biodiversity (Tufour, 1990).

Two of the major shortcomings of current protected areas legislation are: an emphasis on preservation of useful animals as opposed to the conservation of all wildlife; and a lack of provision for conservation beyond the reserve network (EPC, 1989; World Bank, 1988). Amendments to the Wild Animals Preservation Act No. 43, 1960, proposed to be renamed the Wildlife Conservation Act, are intended to address these shortcomings (Kamugasha, 1989; World Bank, 1988).

A weakness of current forest policy and legislation is an absence of any perceived permanent role for trees on land outside of reserved forests (EPC, 1989; World Bank, 1988). Consequently, trees have been used but not replaced on land outside the reserve network, and such land has subsequently been converted to other forms of use. This issue, along with a number of others, are being considered in the revised national forest policy.

International Activities Ghana is party to a number of international conventions concerned with protected areas, namely the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) ratified on 4 July 1975, and the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) acceded to on 22 February 1988. To date, no natural sites have been inscribed on the World Heritage List, while one wetland is listed under the Ramsar Convention. Ghana participates in the Unesco Man and the Biosphere (MAB) Programme, under which one biosphere reserve was approved in 1983. At a regional level, Ghana ratified (1968) the African Convention on the Conservation of

Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The mandate for wildlife conservation and protected areas management lies with the Department of Game and Wildlife, Ministry of Lands and Natural Resources. Initially, matters relating to wildlife conservation came under the jurisdiction of the Forestry Department, which was responsible for administering the Wild Animals Preservation Ordinance of 1901. In 1949, proposals for the organisation of a game department were pre-empted due to a lack of staff and funds (Asibey, 1970). In 1953, responsibilities for game preservation were handed over to the Tsetse Control Department, ironical in view of the Department's active support of a programme of wild animal extermination to control tsetse fly over the previous 20 years (Nuhu, 1986). In 1957, the Tsetse Control Department was abolished and responsibility for game preservation returned to the Forestry Department (Asibey, 1970). In 1965, the Game Branch of the Forestry Department became the Department of Wild Animals Preservation and, in 1967, the Department of Game and Wildlife was formed.

The Department of Game and Wildlife is headed by a Chief Game and Wildlife Officer, under whom are three deputies in charge of the Administration, Research and Management divisions, respectively. The Management Division is divided into four sections: (1) zoological gardens; (2) general wildlife; (3) national parks; and (4) game production reserves, wildlife sanctuaries and strict nature reserves. Matters relating to wildlife conservation outside reserve areas fall within General Wildlife Conservation Services. The Department has four main personnel levels: professional, senior technical, technical, and sub-technical. Including about 400 subordinate employees (labourers, artisans, drivers), the total staff complement is around 1000 (Clarke, 1991). Reorganisation and strengthening of the Department is proposed under the Forest Resource Management Project and the World Bank (IBRD)/IUCN/Government of Ghana (GOG) Programme (Clarke, 1991; World Bank, 1988). Resources have also been allocated to upgrade the Mole Wildlife School for in-service training on wildlife and protected areas management.

Management and protection of the forest estate is the responsibility of the Forestry Department, Ministry of Lands and Natural Resources. First established in 1909, closed in 1914 due to World War I, reorganised in 1919 and again closed during World War II, the Forestry Department came under the Forestry Commission in 1980 and was then transferred to the Ministry of Lands and Natural Resources in 1982 (Bennuah, 1987). Under the Forest Resource Management Project, it is proposed to reorganise the Forestry Department to include a Chief Conservator of Forests and four deputies in charge of 1) administration and finance, 2) development, management and working plans and rural forestry, 3) research, 4) education and training, respectively. There would also be a Planning and Monitoring Unit.

The work of the Forestry Department would be divided into nine forest regions comprising 42 forest districts (World Bank, 1988).

The Forestry Commission, created in 1980 under the Ghana Forestry Commission Act No. 405, initially had jurisdiction over the Game and Wildlife and Forestry departments. Its responsibilities under the Provisional Defence Council (PNDC) Proclamation Law of 1982 have since become primarily advisory, and include formulating recommendations on forestry and wildlife policy.

The Environmental Protection Council, Ministry of Local Government, created under the Environmental Protection Decree (NRC Decree No. 239) of 1974, coordinates and advises on environmental matters, including those related to wildlife conservation. It is also responsible for coordinating environmental impact assessments "on all developments/industrial projects to include the possible effects of such projects on wildlife", and is currently preparing an Environmental Action Plan (EAP) with assistance from the World Bank, US-AID and ODA (Adzobu, 1990; EPC, 1989). The areas of concern addressed in the EAP are land management; forestry and wildlife; marine and coastal ecosystems; human settlements; and legal, educational and institutional issues, among others. The Council is headed by an executive chairman and there are two main departments, namely, Administration and Programmes. The Programmes Department is headed by a director who oversees four divisions: development planning; natural resources management; monitoring and assessment; and information and education. In addition, the EPC operates in the regions through its regional offices (Adzobu, 1990).

The Ghana Association for the Conservation of Nature (GACON), in conjunction with Harrogate Conservation Volunteers, UK, was established in June 1988. According to its constitution, one of the objectives is the "establishment of local reserves of natural forests presently serving as sacred groves, burial grounds and waters" which are to be "managed by the local community". One notable example is Jachie Conservation Area in the Ashanti Region. Declaration of this land as a sacred area for the citizens of Jachie was to fulfil the dual function of protecting an important burial ground and to serve as a refuge for local plants and animals. Other village-level wildlife reserves which have been set up are at Kokobiriko, Asienimpong and Santasi (Frimpong-Mensah, pers. comm., 1990).

There are a number of constraints to protected areas management. Staffing and recruitment, especially at the professional and senior technical grades, have been persistent problems. Within the Department of Game and Wildlife, 18 of 76 posts at the professional level, 17 of 36 positions at the senior technical grade, 19 of 66 posts at the technical level, and 175 of 394 positions within the sub-technical category were filled (Clarke, 1991). Similarly, vacancies are currently at 66% of the

professional category posts, 54% at the semi-professional level, 43% among technical officers and 3% at sub-technical level within the Forestry Department (World Bank, 1988). In both departments, lack of funds has severely restricted management programmes, including the control of concession operations in the case of the Forestry Department. Other constraints include poor remuneration, unsatisfactory living and working conditions in the field, a lack of training opportunities, and in the case of the Department of Game and Wildlife, a lack of management plans, inadequate boundary demarcation, and a lack of scientific data upon which to base management decisions (Clarke, 1991). Substantial resources are being allocated through the Forest Resource Management Project and the IBRD/IUCN/GOG programme to revitalise the functions of these two departments.

Systems Reviews Ghana is bordered by Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Gulf of Guinea to the south. The country is in a flat and relatively low-lying area, with altitude mainly below 200m, although there are some inland hill ranges up to 450-900m. Much of Ghana lies within the drainage system of the Volta River and its tributaries (Ankudey and Ofori-Frimpong, 1990).

The biogeographic affinities are Guinea-Congolian in the south-west, Sudanian in the north, with Guinea-Congolian/Sudanian regional transition zone in the centre and south-east (Stuart and Adams, 1990). Two ecological zones recognised are closed forest, occupying 8.22 million ha or 34% of total land area, and savanna covering 15.62 million ha or 66% (Owusu *et al.*, 1989). Both zones support a number of endemic plant and animal species, the majority of which are found in closed forest. In 1988, the major forms of land use were: forest reserves (11%), wildlife reserves (5%), unreserved closed forests (2%), unreserved savanna woodlands (30%), cultivated tree crops (7%), cultivated annual crops (5%), unimproved pasture (15%), and bush fallow and other uses (25%) (Owusu *et al.*, 1989). Agricultural land in both the savanna and closed forest zones is continually expanding due to the rapid increase in the human population (World Bank, 1988).

At the turn of the century it was estimated that Ghana had 88,000 sq. km of forests, occupying 35% of total land area. By 1950, this had fallen to 42,000 sq. km, and by 1980 it was estimated that forests covered about 19,000 sq. km in the savanna and closed forest zones (Frimpong-Mensah, 1989). The current area of intact closed forest is about 15,000 sq. km, and the current deforestation rate in this zone may be considered negligible, as very little closed forest remains outside the reserve network (Bird, pers. comm., 1991).

Desertification, largely a result of deforestation, is of growing concern in arid and semi-arid areas. It has been estimated that approximately 35% of land area is subject to desertification (UNSO, 1982).

The wetland system includes coastal lagoons, estuaries, mangrove stands, tidal saltmarshes, swamp forests and inland rivers and lakes. Inland water areas occupy approximately 11,800 sq. km., with Lake Volta accounting for 0.85 million ha (Owusu *et al.*, 1989). Along the 550km coastline are an estimated 50 lagoons, many of which are less than 0.5 sq. km (Gordon, 1987). Mangroves are best developed on the western coast, between Côte d'Ivoire and Cape Three Points (Hughes and Hughes, 1991). Currently, mangroves remain unprotected and are faced by a number of threats. One conservation initiative currently underway, however, is a joint venture between the Royal Society for the Protection of Birds (RSPB), International Council for Bird Preservation (ICBP) and the government of Ghana (GOG) in the protection of seabirds and shorebirds and their habitats (Hepburn, 1987). Entitled "Save the Seashore Bird Project", this is one step towards ensuring the protection and sustainable use of the coastal wetland ecosystem.

Concern for deforestation dates back to the beginning of this century with the passing of the Timber Protection Ordinance in 1907 and an assessment of the forest estate by H.N. Thompson. Game reserves were subsequently established in 1909, while the selection, demarcation and constitution of forest reserves in the closed forest area commenced in 1919 (Asibey, 1978; Ghartey, 1990). Following the passing of the Forest Ordinance of 1927, reservation was pursued vigorously and by 1939, 1.6 million ha of closed forest had been constituted as forest reserves (Ghartey, 1990). The protected areas network, including protection and production forest reserves and conservation areas, currently covers 16% of land area, of which natural protection forest reserves account for 0.6% and wildlife sector reserves 5% (Forestry Department/Commission, pers. comm., 1990; Owusu *et al.*, 1989). Of the approximately 280 forest reserves in the country, 180 serve a production function while 100 are considered to be protection reserves (Forestry Department/Commission, pers. comm., 1990). Production forests are managed under production, protection and research working circles. In the closed forest zone, approximately 1.1 million ha is assigned to the production working circles and 0.4 million ha to the protection working circles (Ghartey, 1989).

No national review of the protected areas system has been conducted, but certain priorities to develop the existing network are identified in MacKinnon and MacKinnon (1986), IUCN (1987), and Stuart and Adams (1990). At present, the upland evergreen forest is not represented within the protected areas system, while the inner zone of the semi-deciduous forest type is minimally protected (Hall and Swaine, 1981; IUCN, 1988). A further deficiency is the small size of protected areas in the forest zone (Hall and Swaine, 1981). Despite the fairly extensive system of protected areas, 91% of the area covered by wildlife sector reserves occurs in degraded habitats such as savanna/woodland (Owusu *et al.*, 1989). To help address this deficiency, Kakum

National Park and Assin-Attandaso Game Production Reserve are being proposed for the Central Region, and Agumatsa Wildlife Sanctuary for the Volta Region (Dudley, pers. comm., 1990; Punguese, pers. comm., 1990). A further initiative includes a study of protected areas development in the south-west funded by the Delegation of the Commission of the European Communities (EC) in Ghana (Nagel, pers. comm., 1990). In addition, the Environmental Protection Council is currently supporting preliminary research into sacred groves and the contribution of this form of community-based protection to the protected areas system (Omari, pers. comm., 1990). In contrast to wildlife sector reserves, only 5.6% of the savanna woodland area is in gazetted forests, prompting recommendations to intensify forest reserve creation in this habitat for environmental protection and to stem the southward encroachment of the Sahel (Tufour, 1990).

Under the Forest Resources Management Project, the forestry and wildlife sectors are being reviewed, with the aims of consolidating the present network of protected areas, and improving management both within protected areas and outside them (Howard, 1989; World Bank, 1988). Additionally, the government is engaged in the preparation of a National Forest Strategy Statement which will identify actions to be undertaken and a schedule for their implementation (World Bank, 1988). The Forestry Commission is to play a significant role in reviewing and advising in both of these initiatives. Complimenting the Forest Resources Management Project is the IBRD/IUCN/GOG Programme aimed at strengthening the Department of Game and Wildlife's management of protected areas. This programme, which is to run for four years (1991-1994), has included among its components: institutional development; protected area development; and an environmental awareness programme. The programme will also provide for a review of wildlife and protected area policy, and an assessment of wildlife and protected areas legislation (Clarke, 1991).

Threats to forest reserves include: over-exploitation by concessionaires, particularly of the better-known species; illegal felling; extraction of fuel wood; uncontrolled bushfires, especially in the savanna and semi-deciduous zones; mining activities in some locals; and agricultural encroachment. Poaching of wildlife, conflicts with local citizens and other departments and institutions, and unresolved resettlement issues are problems within the wildlife sector (Nuhu, 1986; Owusu *et al.*, 1989; Stuart and Adams, 1990; World Bank, 1988).

Addresses

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- Ghana Forestry Commission (Chief Administrator), PO Box M-434, ACCRA (Cable: FORCOM ACCRA; Tel: 220818)
- Environmental Protection Council (Director), Ministry of Local Government, PO Box M-326, ACCRA (Tel: 664697/98)
- Ghana Association for the Conservation of Nature (GACON) (President), c/o Institute of Renewable Natural Resources, University of Science and Technology, KUMASI
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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Wild Animals Preservation Act (No. 43)

Date: 1961, last amended 1971

Brief description: Provides for the protection of fauna and flora

Administrative authority: Department of Game and Wildlife (Chief)

Designations:

Reserve

Includes national park, game production reserve, strict nature reserve and wildlife sanctuary.

Entry is by consent of the Chief Game and Wildlife Officer and conditions for entry are determined by him.

It is unlawful to hunt, capture or kill any bird or wild animal, or to collect or destroy any plant except for conservation or management purposes with the consent of the Chief Game and Wildlife Officer.

Other activities prohibited include: the setting of fires; pollution of water; littering; entry with equipment for the purposes of hunting; and the clearing or cultivating of land without written consent.

National park (proposed definition) Area under state control set aside for the propagation, protection, and conservation of wildlife and vegetation, and the ecological stability of wildlife and plant communities.

Other functions include the protection of sites, landscapes or geological formations of scientific or aesthetic values for the enjoyment, education and inspiration of the general public.

Prohibited activities are the hunting, killing and capture of animals, and the destruction and collection of plants and other forms of vegetation except for scientific and management purposes authorised by the minister.

Strict nature reserve (proposed definition) Area under state control for the exclusive protection of floral and faunal resources. Any conflicting activities or land uses are prohibited.

Prohibited activities include any form of hunting, fishing, any development related to forestry, agriculture or mining, grazing, excavation, prospecting, drilling, levelling of the ground or construction, any work which alters soil structure or vegetational character, any form of pollution, and

any act which harms or disturbs the fauna or flora, including the introduction of indigenous or imported, wild or domesticated zoological or botanical species.

Wildlife sanctuary (proposed definition) Area set aside by the state to protect characteristic wildlife, especially migratory bird communities, or to protect threatened animal or plant species.

Any forms of hunting, killing or capturing of any wildlife are prohibited except for scientific research authorised by the minister.

Game production reserve (proposed definition) Area set aside by the state for the conservation, management and propagation of wildlife and its habitat.

Other state controlled land use forms compatible with wildlife conservation may be practised. (This has traditionally included logging.)

Sources: Original legislation; Kamugasha, 1989

Title: Forest Ordinance (Cap. 157)

Date: 1927, last amended in 1986 (PNDCL 142)

Brief description: Allows for the establishment of reserves and sets regulations governing the use and management of forest resources.

Administrative authority: Forestry Department (Chief Conservator of Forests)

Designations:

Forest Reserve

Any government, tribal, stool, private lands or lands deemed to be in need of protection may be constituted as forest reserves by the President inclusive of all limits and rights.

An order, six months following notification in the gazette and known as the date of reservation, brings forest reserves into operation.

Activities prohibited include: farm cultivation, setting of fires, hunting of wildlife, and damage to trees.

In practice, forest reserves and associated areas are defined as follows:

Sacred grove Protected area inside or outside a forest reserve to ensure that the fetish or sacred character of the grove is respected.

Local bye-laws, customs, rites and taboos govern its use and protection.

Production forest Reserve areas which support sustained production of timber and other forest products.

Constitution and prohibited activities as outlined in Forest Ordinance.

Protection forest Reserve area where extraction of timber is usually forbidden, but limited exploitation may be permitted in accessible areas.

Established and managed for the protection of steep slopes and water catchment areas in all or part of a forest reserve.

Constitution and prohibited activities as outlined in Forest Ordinance.

Private forest Small plantation or woodlot established and owned by villages, communities, schools or institutions to meet local fuel wood and pole requirements.

Local restrictions on use apply.

Amenity forest Localised planting of trees owned and managed by individuals, communities or institutions to provide for shade, shelter and beauty (e.g. avenue planting).

Community laws govern its use and management.

Sources: Original legislation; Forestry Commission, pers. comm., 1990

Title: Trees and Timber Decree (NRCD No. 273)

Date: 23 August 1974

Brief description: Allows for the protection of land outside of reserve areas.

Administrative authority: Forestry Department (Chief Conservator of Forests)

Designations:

Protected area Any area outside of a forest reserve may be protected to prevent the waste of trees or timber.

Farming may be allowed to continue so long as a licence is obtained from the Forest Reserve Commissioner.

Prohibited activities include: construction of buildings, damage to trees or timber, and setting fires to any vegetation without the written consent of the Commissioner.

Source: Original legislation

Title: Control of Bush Fires Law (PNDCL 46)

Date: 1983

Brief Description: Deals with the setting of fires in conservation or specified areas outside of gazetted reserves

Administrative authority: Forestry Department or Department of Game and Wildlife

Designations:

Conservation area Any government-protected natural resource area.

Within these areas fires may be set for the purpose of management provided that the fire is controlled and confined and authorisation has been granted by the Chief Conservator of Forests or the Chief Game and Wildlife Officer.

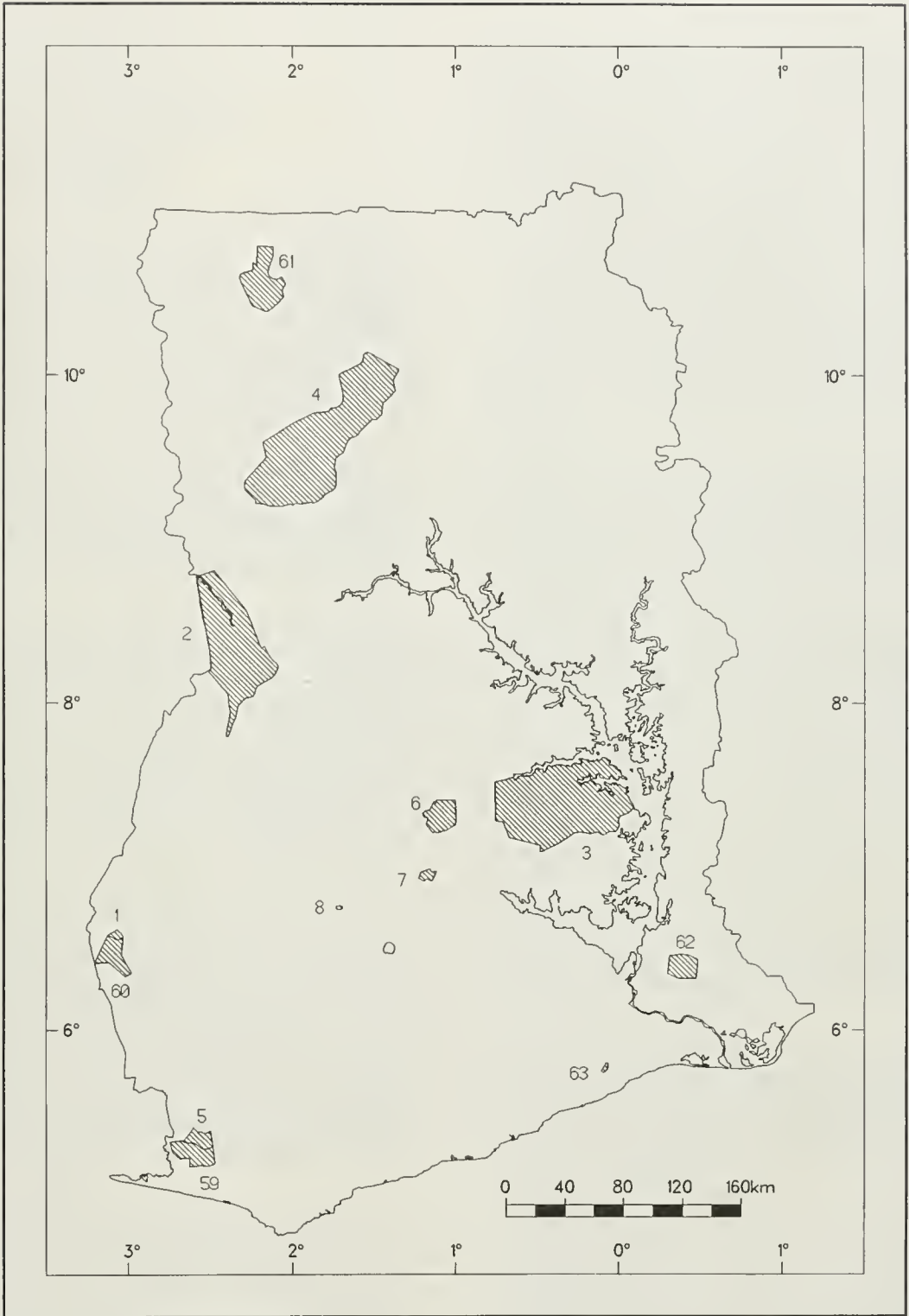
Specified area An area specified in permit by the Department of Game and Wildlife or the Forestry Department in which burning may be necessary for habitat management purposes.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Bia	II	7,770	1974
2	Bui	II	207,360	1971
3	Digya	II	312,595	1971
4	Mole	II	491,440	1971
5	Nini-Suhien	II	10,630	1976
	<i>Strict Nature Reserve</i>			
6	Kogyae	I	32,400	1976
	<i>Wildlife Sanctuaries</i>			
7	Bomfobiri	IV	5,184	1975
8	Owabi	IV	7,258	1971
	<i>Game Production Reserves</i>			
59	Ankasa	VIII	20,736	1976
60	Bia	VIII	22,810	1974
61	Gbele	VIII	54,691	1975
62	Kalakpa	VIII	32,400	1975
63	Shai Hills	VIII	5,443	1976
	<i>Biosphere Reserve</i>			
	Bia National Park	IX	7,770	1983
	<i>Ramsar Wetland</i>			
	Owabi	R	7,260	1988

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Ghana

GUINEA

Area 245,860 sq. km

Population 7.3 million (1990)
Natural increase: 2.5% per annum

Economic Indicators
GDP: US\$ 335 (1987)
GNP: US\$ 350 (1988)

Policy and Legislation Existing legislation providing for protected areas is given in Ordonnance No. 007/PRG/SGG/90 of 15 February 1990 concerning the protection of fauna and hunting regulations (portant code de la protection de la faune sauvage et réglementation de la chasse) (see Annex). This provides for the designation of national parks, strict nature reserves, managed nature reserves, special reserves or faunal sanctuaries, sport hunting zones and hunting zones.

Legislation providing for the administration of protected areas is given in Decree No. 008/PRG/of 19 March 1987, which provides for the establishment of the National Department of the Environment (Direction Nationale de l'Environnement) (Abdel Kader Bangoura, pers. comm., 1987).

The government is reorganising its programme for forest administration (DNFC, 1991). As part of this reorganisation it has produced a national forest policy. This has been drawn up within the Tropical Forest Action Plan, and establishes a framework for forestry activity. The plan emphasises conservation to ensure both the wise use of the full array of forest resources for the benefit of the rural population and the nation as a whole and the maintenance of environmental quality as a basis for economic development (Wilson, in press).

International Activities Guinea ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 18 March 1979. One site was inscribed under this Convention in 1981. Two sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme. The country is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), but is a signatory to the 1968 (Algiers) African Convention of Nature and Natural Resources, which defines strict nature reserves, national parks and special reserves.

Administration and Management The Department of Hunting and Forests (Direction des Forêt et de la Chasse) within the Ministry of Natural Resources and Environment is responsible for the administration of forest resources and fauna. The department works in cooperation with the National Department of the Environment (Direction Nationale de l'Environnement) which is part of the Ministry of the Environment and

Natural Resources (Ministère de l'Environnement et des Ressources Naturelles), as well as with the Department of Scientific and Technical Research (Département des Recherches Scientifiques et Techniques) which forms part of the Ministry of National Education (Ministère de l'Education Nationale). Responsibilities of the Department of Hunting and Forests include: soil protection and restoration; water and soil conservation; protection, management and rational exploitation of forests; protection and exploitation of natural resources; creation and management of protected areas and reforestation. The department is also responsible for supervising four technical divisions and administrative sections. The technical divisions comprise: conservation, forest land regimes and bushfires; rural forestry; forest planning; legislation and forest economy (DNCF, 1991).

The Ministry of Agriculture and Animal Resources (Ministère de l'Agriculture et des Ressources Animales) is responsible for the management of natural resources, including: implementing forest and wildlife action plans; implementing regulations concerning forests and fauna; coordinating regional personnel (DNCF, 1991).

The Code for the Protection of Nature and Hunting Regulations (Code de la protection de la faune sauvage et réglementation de la chasse), as well as providing definitions of protected areas, also stipulates in detail the penalties for infraction which include fines and prison sentences of up to one year. In the introduction to the Code, the failure of attempts to prohibit subsistence hunting in other countries is acknowledged. Hence, emphasis is given in the Code of the need to provide for subsistence hunting, bushmeat forming an important part of the diet of rural communities (DGEFC, 1988).

The responsibilities of the National Department of the Environment (Direction Nationale de l'Environnement) include implementation of government policies concerning environmental matters (Abdel Kader Bangoura, pers. comm., 1987).

Although conditions on the ground still reflect previous neglect, a range of initiatives has been launched that have the potential to achieve real improvements. The key policy statement upon which this revitalisation is based is the national forest policy, whilst the process of developing a national environmental action plan was begun in 1989 (Wilson, in press).

An assessment of the special problems of Mount Nimba, initiated in 1989, is being undertaken, supported by UNDP and Unesco. The WWF-US has started a multilateral development bank programme to monitor the environmental implications of loans to developing countries. One of the first targets was the World Bank's Forestry and Fisheries Management Project, which would have financed logging in two of Guinea's most

important forest reserves (IUCN, 1990). The EEC has invested US\$ 37.5 million in a series of environmental studies in the regions of Moufa, Fouta Djallon and Badiar National Park. There is little information concerning the activities of non-governmental organisations.

According to IUCN (1983), until 1980, nature conservation was afforded very low priority and little effective protection appeared to be afforded to any area. However, Kaba and Diallo (1983) reported that the protection and rational management of natural resources was a cornerstone of development policy.

Despite the adequate legal provision for administration of protected areas, in reality, important problems occur due to the number, quality and distribution of forest personnel. The personnel are too numerous, unqualified and largely do not produce good results, hence rationalisation of forest administration is recommended (République de Guinée, 1987b). All forested conservation areas are subject to management problems, with inadequate protection and hunting and agricultural encroachment within their boundaries (Wilson, 1992). Both strict nature reserves wildlife are threatened by hunting, and the habitat is being destroyed by logging and cultivation (Sournia *et al*, 1990). Mount Nimba, which is both a biosphere reserve and a World Heritage site, is under severe threat from plans for mining. Controversy currently exists over the precise boundaries of the World Heritage site, which has important implications for the granting of mining concessions.

Systems Reviews Guinea has a 280km coastline, which is mainly deltaic. Inland is a coastal plain, 60km wide in the southern section, but narrowing to 30km in the central section, and intercepted by hills which reach the sea at Conakry. North of this the plain broadens to a maximum width of 90km at the northern border. Inland, the foothills of the Fouta Djallon mountains, which form the north-western end of the Guinean Dorsale, rise abruptly from the coastal plain. The Guinean Dorsale runs south-eastwards from the Fouta Djallon Mountains to the Nimba Mountains on the border with Ivory Coast, where Mt Nimba, the highest point in Guinea, reaches 1,752m. Approximately 20-25% of land, including many peaks in the Fouta Djallon and Nimba Mountains, exceeds 1,000m. The north-western and south-eastern areas are mountainous and deeply dissected. The headwaters of many of the major rivers of West Africa (e.g. Niger, Gambia, Senegal) lie in the highlands of the Fouta Djallon (Hughes and Hughes, 1991; République de Guinée, 1987b; Wilson, in press).

Floristic affinities range from Sudanian in the extreme north-east to Guinea-Congolian in the south and south-west. The coastal plain is covered by broad-leaved lowland forest, both primary and secondary, while the Fouta Djallon and Nimba mountains, both important centres of endemism, are covered by upland evergreen forests and Afromontane elements. The original moist forest (evergreen, semi-deciduous and submontane)

covered around 73% of the country. The western borderlands are covered by deciduous forest and savanna, and the headwater basin of the Niger by Guineo-Soudanian transitional savanna, with broad bands of deciduous or semi-deciduous gallery forest along this river and its major tributaries. Freshwater swamp forests occur behind coastal mangroves. Flood plains occur along most rivers due to the highly seasonal nature of the rainfall (Hughes and Hughes, 1991; République de Guinée, 1987b). The coastal wetlands are of international importance, providing food for many waterbirds, including Palaearctic migrants (ICBP, 1991).

Deforestation has resulted in the disappearance of 98% of the original forest cover (Wilson, in press). Much of this was lost long ago, particularly on the Fouta Djallon, although considerable areas of semi-deciduous forest may still have been present at the turn of the century (République de Guinée, 1987). The semi-deciduous, drier moist evergreen and northern submontane forests are now reduced to scattered, degraded relicts. Extensive forest is now concentrated in the south-east in the moist evergreen zone (Wilson, in press). Until 50 years ago the deltaic coast was mangrove clad along most of its length, the mangroves playing an important role in protecting the coastline as well as littoral aquatic fauna. However, in recent years much of this (up to 16% by 1980) has been cleared for agriculture (notably for rice paddy), such that reduction in the area and quality of mangroves is now a serious problem (République de Guinée, n.d.b).

Rice, bananas and coconuts are farmed on the coastal plain and corn and cassava in the drier north eastern region (Bissio, 1986). Traditionally, the mangrove areas have provided a rich supply of fish and prawn protein and the estuaries and mangrove creeks have always been fished. The mangroves are also exploited for constructional timber and for fuelwood (Hughes and Hughes, 1991).

As recently as the early 1980s, nature conservation was given very low priority. There were only two protected areas, Massif du Ziama and Mount Nimba strict nature reserves, in the whole country (other than forest reserves), both of which primarily protect montane vegetation (MacKinnon and MacKinnon, 1986; Wilson, in press). This situation has altered and conservation is now a matter of great concern. Badiar National Park was established in 1985, contiguous with Senegal's Niokolo-Koba National Park. Currently 155 classified forests and these 3 protected areas cover 5% of the country.

A number of other sites have been identified as potential protected areas. The identification of the sites is, however, mostly based on anecdotal information and there is a recognised need for proper survey and inventory work upon which to base the further development of the protected area programme (Wilson, in press). No mangroves are included within classified forests (République de Guinée, 1987b). Several reports

contain proposals to improve the protected areas system. In their report on the ornithological status of coastal Guinea, Altenburg and Van der Kamp (1989) recommend the establishment of two to three mangrove reserves, to include all types of coastal wetland and the most important bird areas along the coast, and mapping of these bird areas. Establishment of two islands, Alcatraz and Pani Bankhi, as ornithological reserves is also recommended. Detailed proposals for the improved management of forests in south-east Guinea are given by Bourque and Wilson (1990). Forest exploitation outside areas requiring integral protection is considered to be compatible with effective conservation, if management is strictly organised. Reforestation and rehabilitation of logged areas of forest reserves, and protection of remaining areas is recommended, together with: creation of integral protection zones within classified forests; recruitment of reserve guards from amongst the best local hunters, with good knowledge of the area rather than academic qualifications; and a reexamination of agroforestry within classified forests, ideally leading to a prohibition of all agriculture. Compensation to those thus deprived of cultivatable land should then be made by way of equivalent areas of land outside the forest reserve. Proposals to improve the protected areas system are also given by MacKinnon and MacKinnon (1986) and IUCN (1987).

Mount Nimba Biosphere Reserve is under great threat from mining for iron ore. Mount Nimba straddles Guinea, Côte d'Ivoire and Liberia and the part within Liberia has already been badly degraded by ore extraction (Lamotte, 1983; Sawyer, 1990). A review by the World Bank of their project on iron ore mining in Mount Nimba states that there are no financial justifications for the Bank to proceed with the project (J. Robertson, pers. comm., 1989). The area is also under serious pressure from encroachment by refugees from Liberia, following the civil war there (Sawyer, 1990).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Ordonnance No. 007/République de Guinée/SGG/90 portant code de la protection de la faune sauvage et réglementation de la chasse (concerning the code for the protection of nature and hunting regulations)

Date: 15 February 1990

Brief description: Provides for the designation of national parks, integral nature reserves, managed nature reserves, special reserves or faunal sanctuaries, sport hunting zones and hunting zones.

Administrative authority: Direction Nationale des Forêts et Chasse (National department for Hunting and Forests)

Designations:

Parc national (National park) An area for the protection, conservation and natural evolution of wildlife as well as for sites of scenic or geological, aesthetic or scientific value.

For the public interest, education or recreation so long as this is not detrimental to its primary role first mentioned.

Formed from the classified domain, given in the forest code (code forestier), by an order (ordonnance) which establishes them as national parks.

Coastal national parks may include areas of sea.

Activities forbidden include any form of disturbance or harm to animals or their nests or harm to vegetation without special authorisation for scientific reasons or prevention of disease.

Also prohibited is: circulation outside tracks and roads open to the public; parking outside indicated areas during the day or outside campsites or hotels at night; possession of arms; flying at an altitude beneath 300m.

Commercial activities prohibited include: exploitation for forest, agriculture or mining purposes; grazing of domestic animals; mining, drilling, excavation or any form of construction which modifies the ground or vegetation except that

which is necessary for the creation of important infrastructure for surveillance or tourist reception.

In marine or aquatic areas marine or sub-marine activities are prohibited, as is navigation except where this is necessary for surveillance, touristic visits, scientific research and security at sea.

For each national park regulations are fixed determining which of the above regulations apply.

Area under state control.

Réserve naturelle intégrale (Strict nature reserve) A terrestrial or marine area, undisturbed except for measures necessary to safeguard it.

Comprising parts of the classified domaine provided for under the forest code as well as marine zones other than those created as national parks, which necessitate a particular protection.

Classification is by order (ordonnance) or the ministerial authority responsible for hunting.

Activities prohibited include: hunting and fishing, forest, agricultural or mining exploitation, grazing or domestic animals; mining, drilling, excavation or any form of construction which modifies the ground or vegetation; water pollution; introduction of exotic animal or plant species and in general any act which disturbs the fauna or flora.

Activities for which special written authority is necessary include: entry, circulation, flying below 300m and camping.

Area under state control.

Réserve naturelle gérée (Managed nature reserve) An area for the conservation and management of fauna and where human activities are controlled.

Classification is fixed by order by proposition of the ministerial authority responsible for hunting, which fixes restrictions concerning hunting, animal capture, utilisation of produce of the soil and building.

Hunting is forbidden throughout the area.

Réserve spéciale (Special reserve) or Sanctuaire de faune (Faunal sanctuary) For the protection of characteristic faunal or floral communities or for particular threatened animal or plant species.

Any other interest or activity is subordinate to the achievement of this objective.

Classification is by order of the ministerial authority responsible for hunting.

In sanctuaries, management favours those animals or plant species for which the reserve was established.

The particular regime for each sanctuary is stipulated in the order which creates the sanctuary.

Faunal sanctuaries are under state control.

Zone d'intérêt cynégétique (Sport hunting zone) Areas where game and hunting present an economic or major scientific interest and where the fauna is capable of, being maintained at a high level.

Created by order on the joint authority of the ministry responsible for hunting and other interested ministries.

For each zone, a regulation is fixed by decree of the ministerial authority responsible for hunting to determine the mode of practice of hunting, the destination of hunting produce and compensation payable for damage caused to other sectors of the economy.

In the absence of this decree, hunting is prohibited.

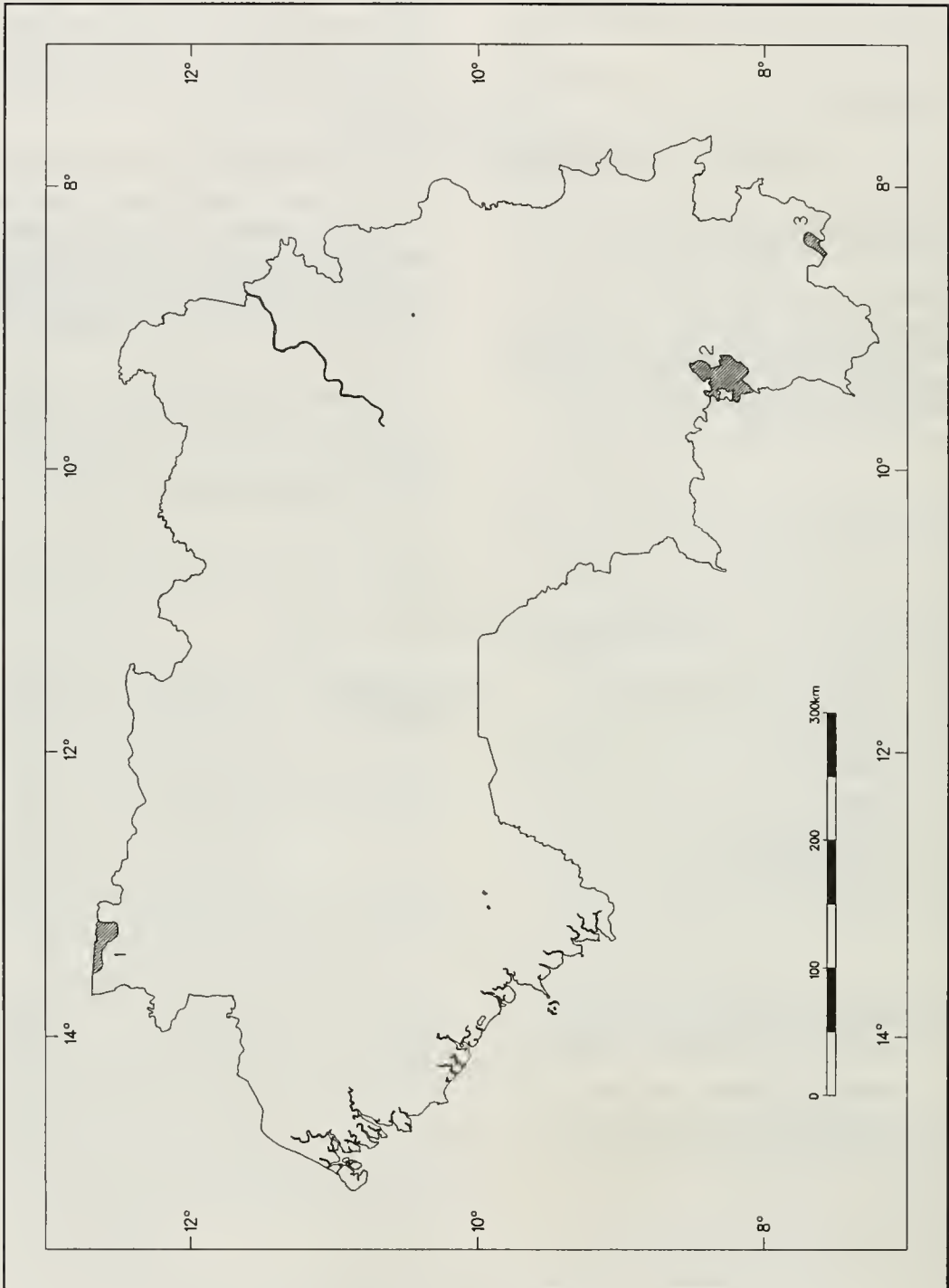
Zone de chasse (Hunting zone) Includes all territory in the public zone, not classified as national park, integral or managed nature reserve, faunal sanctuary, sport hunting zone, with the exception of roads, railway tracks, navigable routes, construction zones and areas where hunting is not compatible with public security.

In remaining areas hunting is permitted for purposes of feeding native populations and for recreational activities.

Source: Original draft legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	<i>National Park</i> Badiar	II	38,200	1985
	<i>Strict Nature Reserves</i>			
2	Massif du Ziama	I	116,170	1932
3	Mount Nimba	I	13,000	1944
	<i>Biosphere Reserves</i>			
	Réserve de la biosphère des Monts Nimba	IX	17,130	1980
	Réserve de la biosphère du Massif du Ziama	IX	116,170	1980
	<i>World Heritage Site</i>			
	Mount Nimba Strict Nature Reserve	X	57,600	1979



Protected Areas of Guinea

REPUBLIC OF GUINEA-BISSAU

Area 36,120 sq. km

Population 964,000

Natural increase: 2.14% per annum

Economic Indicators

GDP: US\$ 178 per capita (1987)

GNP: US\$ 160 per capita (1988)

Policy and Legislation Guinea-Bissau has as yet not developed a comprehensive protected area legislation. Decree No. 40040 of 20 January 1955 of the Ministério do Ultramar (Overseas Ministry) of Portugal was replaced by the Regulamento de Caça, Decree No. 21-80 of 12 May 1980. Six hunting reserves were established under this Decree in which all hunting is permanently prohibited (see Annex) (MDR, 1991). The Regulamento Florestal, approved by Decree No. 44531 of 21 August 1963, details legislation pertaining to forest management, although there are no classified forests. A national conservation strategy is under preparation in collaboration with IUCN, with particular attention being paid to coastal zone management and the development of a protected areas network (IUCN, 1987a).

International Activities At an international level, Guinea-Bissau participates in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) under which one site has been listed. It is not signatory to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), the Unesco Man and the Biosphere (MAB) Programme, nor to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The existing six hunting reserves are the responsibility of the Directorate of the Forestry and Hunting Service (Direcção General dos Serviços Florestais e Caça), within the Ministry for Rural Development and Agriculture (Ministerio do Desenvolvimento Rural). However, the reserves are not currently managed, and are indistinguishable from surrounding territory (MDR, 1991).

There are no forest reserves; as forest and woodland are communally owned, there is no legal protection from felling, and it is the aim of the government to promote timber extraction to increase foreign revenue. The Forestry Service facilitates this process. The Ministries of Industrial Fisheries, Artisanal Fisheries, Tourism, Rural Development and Agriculture, Transport, and Natural Resources and Industry all play a role in the management of the Bijagos archipelago (Agardy, 1991).

Assistance has been received from several countries concerning conservation. IUCN provides a local official

resident and has participated with the Ministry for Rural Development and Agriculture in the development of the National Conservation Strategy. IUCN is also directly involved in planning conservation of the coast zone, including the creation of Bijagos Archipelago Biosphere Reserve. To date, the establishment of three protected coastal areas have been recommended (MDR, 1991; Sayer *et al.*, 1990). Guinea-Bissau was the focus for IUCN/WWF Project 3096, the aim of which was to make an inventory of wetlands in the country and of the migratory birds which use them; recommendations for protection and management will be made (IUCN/WWF, 1983/84). The Canadian Centre for Study and International Cooperation has helped in the creation of Dulombi National Park. The Portuguese National Parks Service has been directly involved in creation of Cufada National Park (MDR, 1991).

Systems Reviews Bordered by Guinea to the south and east, Senegal to the north and the Atlantic ocean to the west, most of the country is a low-lying coastal plain rising through a low plateau to 262m in the east, where low mountains (a continuation of the Fouta Djallon in Guinea) occur. There are at least 20 ethnic groups in the country, with about 65% of the population inhabiting the coastal regions. Despite having a subsistence economy, Guinea Bissau is heavily dependent upon international aid. The country achieved independence from Portugal in 1973, and is considered to be one of the least-developed and poorest countries in the world.

Guinea-Bissau falls within the Guinea-Congolian/Sudanian Regional Transition Zone. The vegetation, originally a mosaic of lowland forest and woodland, has been largely cleared, and secondary grasslands are dominant in many areas. Broad-leaved forest occupies the centre of the country.

Several large rivers flow roughly from north-east to south-west, forming long estuaries at the coast. The most extensive areas of mangroves on the continent (2,360 sq. km, or 8% of the country), are found along the coast and estuaries, and on the offshore islands. The largest aggregation of islands, the Bijagos Archipelago, consists of about 20 large permanently-inhabited islands, 26 seasonally-inhabited islands, and 37 uninhabited islands and islets, many of which have outstanding characteristics (Agardy, 1991). It is estimated that 12% of the 8 million Palaearctic waders that migrate along the west African coastline winter on the coast of Guinea-Bissau (Sayer *et al.*, 1990; Stuart and Adams, 1990).

Guinea Bissau has a weakly developed protected areas network, although several important sites are currently under consideration (MDR, 1991; Sayer *et al.*, in press). Priorities regarding the establishment of a protected areas network for the country have been identified by

MacKinnon and MacKinnon (1986), IUCN (1987b) and Stuart and Adams (1990). These include protection of the extensive coastal and estuarine mangroves, including long-term planning for the Bijagos Archipelago and possible designation of this area as a biosphere reserve; designation of Orango National Park; protection of interesting forest patches at Olon, Lagoa de Cufada and Cantanhez; a survey of coastal fisheries in order to enable conservation proposals; and surveys of marine turtle nesting sites (Agardy, 1991; MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990).

The country is poorly-known biologically, and its natural resources are threatened by fires, extensive clearing and exploitation of forests, inappropriate agricultural practices and overgrazing (IUCN, 1987a). Extensive development of rice paddies (the staple food) and cashew plantations have resulted in large areas of mangrove and forest being cleared. It is estimated that 15-20% of tidal forest was lost between 1975-1986, and a total of 83,280ha have been lost to rice cultivation. Local hunting and timber extraction within the six protected areas is virtually unchecked (Sayer *et al.*, in press; Stuart and Adams, 1990).

Addresses

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BP 179, BISSAU

IUCN Representative, BP 23, 1031 BISSAU (Tel:
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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Decree No. 21-80

Date: 12 May 1980

Brief Description: A Statutory Instrument which,
inter alia, establishes hunting reserves

Administrative Authority: Directorate of the
Forestry and Hunting Service (Director)

Designations:

Hunting reserve

KENYA

Area 580,370 sq. km

Population 24,031,000 (1990)

Natural increase: 3.7% per annum

Economic Indicators

GDP: US\$ 373 per capita (1987)

GNP: US\$ 360 per capita (1988)

Policy and Legislation The 1989-1993 Development Plan outlines government strategies to reduce negative environmental impacts. These include baseline environmental resource surveys, analyses of environmental impacts for economic development projects, and nature resource conservation measures (ERL, 1990). Further, the government is currently preparing a sessional paper on environmental management and protection as the basis for a National Environment Enhancement and Management Act (ERL, 1990).

Shortly after independence, the government's commitment to conservation was stated in Sessional Paper No. 10, 1965 entitled "African Socialism and its Application to Planning in Kenya": '... The importance of Wildlife to Kenya's future prosperity must be appreciated by everyone and National Parks and Reserves must be protected and preserved' (Chumo, 1983). It is envisaged that a national conservation strategy (NCS) will be developed in the near future (Olindo, pers. comm., 1991). This strategy will have a valuable role to play in bringing together the different sectors whose activities have an effect on the environment and in encouraging the formulation of clear conservation objectives and recommendations for action (IUCN, 1990).

Wildlife policy is reflected in Sessional Paper No. 3, 1975: Statement on Future Wildlife Management Policy in Kenya. Goals of this policy include, *inter alia*: optimising returns from the wildlife resource; coherent planning of projects and wildlife programmes; and the establishment of a Wildlife Training Institute. In this document it is stated that a major objective of national parks is "to preserve in a reasonably natural state examples of the main types of habitat which are found in Kenya for aesthetic, scientific, and cultural purposes" (GOK, 1975). National parks are to provide for educational and recreational opportunities, while agricultural, pastoral, forestry and consumptive wildlife utilisation activities are prohibited. National reserves may be on any type of land and their main objectives are similar to those for national parks, with the exception that other forms of land use may be specifically allowed. The Kenya Wildlife Service is currently preparing a new policy statement to outline the current position and future plans regarding the protection and management of wildlife (ERL, 1990).

A forest policy was set out in Sessional Paper No. 1, 1968, which is still the official written policy, although new guidelines are in preparation (ERL, 1990). The aims of the forest policy are to provide guidelines for the development, management, utilisation and regulation of forest resources; to demarcate and increase the total forested area as far as possible; and to draw up management plans for all forests, based on the principle of sustained yield (ERL, 1990).

The pre-independence Wild Animals Protection Act (Section 3) made provision for the establishment of game reserves, while the National Parks Ordinance, first set out in 1945, provided the National Park Trustees with the authority to acquire land for national parks and gave them limited jurisdiction over land established as national reserves (Casebeer, 1975). The primary law concerning the management of wildlife today is the Wildlife (Conservation and Management) Act No. 1, 1976 contained in *Kerya Gazette* Supplement No. 8 (Act No. 1) of 13 February 1976 and Legal Notice No. 219, in *Kenya Gazette* Supplement No. 57, Legislative Supplement 43 of 22 October 1976. This Act, which was last amended in 1989, updates earlier legislation and allows for the creation of national parks, marine national parks, national reserves, marine national reserves, local sanctuaries, and protection areas (Annex). The Minister responsible for tourism and wildlife has the power to declare any area of land a national park, national reserve or local sanctuary and may define and amend the boundaries with the consent of the appropriate authority. Where the competent authority does not consent to declaration, no order is made unless a draft of the order has been approved by the National Assembly, Trust land has already been set apart in accordance with the Constitution, or where private land has first been acquired under the Land Acquisition Act. A notice of intention to declare such areas must be published in the *Gazette* and in at least one Kenyan newspaper. Other powers of the Minister include: the ability to declare any area adjacent to a national park, national reserve or local sanctuary a protection area, and to specify the activities allowed therein; to name national parks; to make regulations regarding park fees; to amalgamate or divide national parks; to degazette protected areas after consultation with the appropriate authority; and to make rules for the efficient control and management of these areas (Annex). Regulations for all or specified national parks may be made by the Minister and different rules for different parks may be laid down. The Act also specifies the powers accrued to officers managing protected areas, outlines licensing procedures, and establishes a wildlife fund. Subsidiary legislation includes The Wildlife (Conservation and Management) (National Parks) Regulations (L.N. 219, 1976), which makes general provision for the regulation of national parks, prohibits certain acts and nuisances within such

areas, specifies penalties for offences against the regulations, and prescribes fees. Although the Act allows certain forms of hunting outside national parks under licence, Legal Notice No. 120, 1977, banned all forms of hunting of game animals, including subsistence hunting (ERL, 1990).

The principal forestry legislation is the Forests Act (Cap. 385), commenced on 1 March 1942, and last revised in 1982. This Act sets the basic principles for all forest management practices, outlines offences and accompanying penalties, and has the general aim of controlled utilisation of forests. Under this Ordinance, central forests, forest areas and nature reserves are declared by proclamation in the *Gazette* (Annex) (ERL, 1990). Before a declaration is made, 28 days notice of the intention to declare must be published by the Minister in the *Gazette*. The Minister may declare any unalienated government land to be a forest area, declare and alter the boundaries of a forest, and declare that a forest area or nature reserve shall cease to exist. The Minister may also make rules pertaining to the sale of and disposal of forest produce; the use and occupation of land in reserved areas; the granting of licences; the prescribing of fees and royalties; and the closure of a central forest or forest area. Nature reserves can be proposed on the basis of uniqueness of plant, animal or physical feature or international concern, and if accepted become separately gazetted under the Forest Act (Harrison, 1983). Ungazetted forest land is always county council trust land, whereas gazetted forest is either government forest (Forest Department) or county council trust land (Beentje, 1990). Subsidiary legislation includes The Forests (General) Rules, which deal with royalties and licences; The Forests (Closing) Rules; The Forests (Fish Hatcheries) Rules, which regulate the use and occupation of reserved areas for the purpose of installing commercial fish hatcheries; The Forests (Controlled Entry) Rules; The Forests (Closing of Roads) Rules; and a set of rules governing the use of central forests in a number of land units and districts throughout the country. A Presidential Decree banned all cutting of indigenous timber in 1986/87, and subsidiary legislation has been drawn up to establish rules on the use of certain gazetted forests.

Along the coast, there are forest areas known as "kayas" which consist of coral or limestone caves within groups of trees, some of which are considered to be "sacred groves" (Pertet, 1982). It has been proposed to gazette these forests as "national monuments" under the jurisdiction of the National Museums of Kenya (KWS, 1990; Robertson, 1984).

Government forest policy, along with many legislative measures, is currently under revision (ERL, 1990). The policy of preventing forest incisions has not been followed, there is an urgent need for improvements to forest land use planning through the strengthening of legal and policy aspects, and relevant policies are not well-integrated across sectors (ERL, 1990; World Bank, 1988). Owino (1983) has stressed the need for a more

coordinated forest policy considering the survey and conservation of natural forests, and the need for an effective plantation programme (Polhill, 1989). Current forestry legislation does not protect vegetation outside the gazetted forests and enforcement of existing forestry legislation in parts of the country is inadequate (ERL, 1990; ETMA/NES, 1985; WWF, 1989). Although wildlife includes both flora and fauna under the Wildlife Act of 1989, the responsibilities of KWS for conservation and management of plants outside parks and reserves is limited and ill-defined (KWS, 1990). Regulations pertaining to marine protected areas are also largely insufficient (ERL, 1990).

International Activities Kenya is party to a number of international conventions concerned with protected areas, namely the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) ratified in 1991, and acceded to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) on 5 June 1990 with one site listed on accession. Kenya participates in the Unesco Man and the Biosphere (MAB) Programme, under which five sites have been approved as biosphere reserves. At the regional level, Kenya is party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management Responsibility for environmental management lies with the National Environment Secretariat (NES), within the Ministry of Environment and Natural Resources. This Secretariat, which was established in 1974, lays down the country's general policy on environmental management and plays a key role in environmental impact assessments (Muslim, 1983). Created under the auspices of the NES, the Interministerial Committee on Environment (IMCE), serves as a useful bridge between the NES and the different Ministries (Kiriro, 1987).

The former National Parks Administration set up by Ordinance 9 of 1945 (the National Parks Ordinance) was combined with the former Game Department under the Wildlife (Conservation and Management) Act of 1976. This newly formed Wildlife Conservation and Management Department (WCMD), within the Ministry of Tourism and Wildlife, existed until 1989 when an amendment to the Wildlife Act created the parastatal Kenya Wildlife Service (KWS). The principal goals of KWS, which came into existence on 15 January 1991, are: to conserve natural environments and their flora and fauna; to use the wildlife resources sustainably for the economic development of the nation and for the benefit of people living in wildlife areas; and to protect people and property from injury or damage caused by wildlife (KWS, 1990, 1991). Responsibilities of this corporate body include, *inter alia*: the formulation of policies concerning conservation, use and management of flora and fauna; advising the government on the establishment of national parks, national reserves and other protected

wildlife sanctuaries; preparing and implementing management plans for protected areas; conducting and coordinating research activities for wildlife conservation and management; and administering and coordinating international wildlife protocols, conventions and treaties (ERL, 1990). KWS is self-financing, receiving income from national parks, national reserves and game sanctuaries, as well as from government and international grants. It is anticipated that between US\$ 150-200 million will be spent on its programmes over the period 1991-1996 (Mburugu, pers. comm., 1991).

A Board of Trustees oversees the activities of the Kenya Wildlife Service and the Director of KWS has general superintendence of all matters within the province of the Wildlife Act. Under the Director is found a Senior Deputy Director who is responsible for wildlife conservation. Responsible to him is a Deputy Director for Parks and Reserves and a Deputy Director of Wildlife Services. Regional chief wardens (eight) are employed in the Parks and Reserves Division, while a newly proposed Community Wildlife Service HQ Unit is to be found within the Wildlife Services Division (KWS, 1990).

National reserves are vested in the ownership of the local councils and are administered by district councils, with the exception of Shimba Hills which is managed directly by KWS (Brakel, 1979; Thorsell and Pertet, n.d.; SWARA, 1990). In general, national reserves can be managed by KWS, but only by agreement with the councils (Western, pers. comm., 1991). The councils have been instrumental in not only running, but in setting aside a number of conservation areas throughout the country (Shete, 1991).

Nature reserves and forest reserves fall under the mandate of the Forest Department within the Ministry of Environment and Natural Resources. There are four levels of administration in the Forest Department: national headquarters; provincial forest offices (eight); district forest offices; and individual forest stations. At the national level, the structure of the Forest Department comprises a Director, deputies, chiefs, who oversee the activities in six divisions (Forestry Extension Services; Industrial Forestry; Projects Development and Monitoring; Natural Forests Management; Manpower Development; and Forest Engineering Services), heads of branches within the divisions, scientists, foresters, technical and administrative staff (Forest Department, pers. comm., 1991). As of 1988, the Forest Department had posts for about 3,200 approved professional and technical staff, of which less than half were filled (World Bank, 1988). The budget for the Forest Department for the 1987/88 fiscal year was KSh 60 million per annum in recurrent expenditure and KSh 320 million in development expenditure (World Bank, 1988).

Establishment of forest reserves can be initiated at any level from local through the county council to the Minister in charge of forests. In practice, nature reserves

are administered by the Ministry of Tourism and Wildlife, district game wardens of the Kenya Wildlife Service (KWS) and by staff of the Forest Department (ERL, 1990). Trust land forests are managed by the county councils, while national monuments fall under the management of the Trustees of the National Museums of Kenya, within the Ministry of Constitutional Affairs (Aveling, 1986; KWS, 1990; Pertet, 1982).

Cooperative agreements between Kenya and Tanzania include an action plan to conserve and strengthen the Mara-Serengeti ecosystem (SWARA, 1989). In support of this is an ongoing ecological monitoring project at Masai Mara Reserve which, *inter alia*, will explore options for resolving land use conflicts in the Mara region (WWF, 1991a). Further, the establishment of a corridor to allow elephant migration between Amboseli National Park, Kenya and Mt Kilimanjaro National Park, Tanzania has been planned (KWS, 1991).

The Wildlife and Fisheries Training Institute has been established at Navaisha to train wardens in the techniques of managing both the terrestrial and marine parks/reserves, while the Kenya Marine and Fisheries Research Institute at Mombasa is conducting research on the reef system (Pertet, 1982; UNEP/IUCN, 1988). Forestry management is taught at the Kenya Forestry College at Londiani and the Faculty of Forest Resources and Wildlife Management at Moi University in Eldoret (World Bank, 1988; Mburugu, pers. comm., 1991).

In total, there are currently fifteen or so national organisations and over 60 non-government organisations involved with the promotion of forest conservation and afforestation (ERL, 1990). International agencies and NGOs concerned with conservation of nature and who are involved with developing wildlife plans or conventions include: UNEP, IUCN, WWF, Royal Geographical Society, New York Zoological Society, the East African Wildlife Society which was formed in 1961, the African Wildlife Foundation, and the Wildlife Clubs of Kenya, the latter two of which have focused their efforts primarily on conservation education (Coe, 1983; ERL, 1990).

One of the major constraints on management of existing protected areas in Kenya and other countries of East Africa, is the lack of planning documents (Thorsell, 1984). Deficiencies in manpower, scientific information and finances are major difficulties in developing adequate plans, and in managing new and established protected areas (ERL, 1990; Pertet, n.d.; World bank, 1988). No inventory of the natural forest has taken place since the 1960s, making it difficult to manage the forest resource on a sustained yield basis (World Bank, 1988). The divided responsibility for managing nature reserves between the Forestry Department and KWS is problematic due to differences in policy and in the need for expertise in forestry matters, management of wildlife reserves and tourism (ERL, 1990; Polhill, 1989). There are difficulties in gazetting a number of proposed

national parks and reserves due to their small size and land status (Pertet, n.d.). Local sanctuaries are limited to 2,600ha in size, not all are formally gazetted, none has a budget, and receive only occasional inspection visits by wardens (Thorsell and Pertet, n.d.). Effective marine management requires active cooperation between the Department of Fisheries and Kenya Wildlife Service (WWF, 1989).

Systems Reviews Kenya is bordered by Tanzania to the south, Uganda to the west, Sudan and Ethiopia to the north, and the Indian Ocean to the east. The altitude ranges from sea level to 5,200m at Mt Kenya. A distinguishing feature of Kenya is the Eastern or Gregory Rift Valley, which crosses the country from Lake Natron in the south to Lake Turkana in the north, bisecting the interior plateau (Hughes and Hughes, 1991). The highlands form most of the south-west and central parts of the country and have an elevation of between 1,400-2,800m (FAO, 1981). Kenya is still largely an agricultural nation with 81% of its people living in rural areas (IUCN, 1990).

Biogeographic affinities are predominantly Somali-Masai, with Afromontane in the mountains, Afroalpine elements on the highest peaks, Zanzibar-Inhambane regional mosaic along the coastal belt, Lake Victoria Regional Mosaic in the west, and Guinea-Congolian in the Kakamaga area (Stuart and Adams, 1990). Approximately 3.8% (2.2 million ha) of the country is composed of forested land, 2.1% is inland water bodies, and about 75% composed of woodlands, bushlands and grasslands, mostly in arid and semi-arid areas (ETMA/NES, 1985; WCMC, 1991; Forest Department, pers. comm., 1991). It has been estimated that in about 30 years, only 1-2% of the country will be covered with forests (IUCN, 1983). Desertification is a growing concern. Approximately 75% of the land surface and 15% of the population is continually threatened by advancing deserts (Kundaali, 1983).

The coastline extends for some 450 km, with fringing and patch reefs found 0.5-2.0km offshore (UNEP/IUCN, 1988). A number of these reefs, together with tidal swamps, are afforded a degree of protection in the marine national parks and reserves (Hughes and Hughes, 1991). In addition, gazetted forests include some 50,000ha of mangroves, mostly in Lamu, Kilifi and Kwale districts of Coast Province (Fayad, n.d.; World Bank, 1988). Further, exploitation of mangrove forests for local housing and charcoal has to a government ban and full protection to all remaining mangroves (Kundaali, 1983). Freshwater lakes include Victoria, Naivasha, Baringo and Ol Bolosat, while alkaline lakes within the Rift Valley system include Nakuru, Elmentaita, Bogoria and Magadi (Pertet, n.d.). The majority of these remain unprotected (Hughes and Hughes, 1991). It has been estimated that about 7% of wetlands are lost to agriculture annually (WWF, 1991b). In response to this, one of the goals of the Kenya Crane and Wetland Research Project is to determine how

wetlands can be used on a sustainable basis (WWF, 1991b).

The first marine parks in tropical Africa were established in 1968 at Malindi and Watamu by the Kenyan government (Brakel, 1978). This followed earlier efforts to control expanding tourism and traditional fishing around the Malindi/Watamu reefs through the establishment of fish reserves in 1963/64 by the Fisheries Department (Brakel, 1978; Ray, 1969). Today, marine national parks and reserves protect an area of about 114,000ha (WCMC, 1991). The recently gazetted Ras Tenewi Marine National Park is unique in incorporating both a marine (245 sq. km) and a terrestrial component (105 sq. km) within its boundaries (Pertet, 1982).

The marine ecosystem is threatened by sedimentation, expanding settlements, and pollution. In addition, abuses to coral reefs include fishing, coal mining, anchor damage, dynamiting, and tourism/recreation impacts, among others (Kundaali, 1983; KWS, 1990; Pertet, 1983). It has been suggested that reefs such as Kanamai and Vipingo be included in a large fishing reserve system which would restrict fishing through temporary closures (McClanahan, 1990). Other recommendations include the need to improve management of existing protected reef areas, establish coastal zone management programmes, and to develop strategies to deal with the impacts of siltation (UNEP/IUCN, 1988).

Although game reserves were established as early as 1898 by Regulations in the *Gazette* for East Africa and the East African Protectorate, the modern national park system began with the establishment of Nairobi National park in 1946 (Casebeer, 1975). By 1948, the park system was about 80% complete in terms of total area protected (Thorsell and Pertet, n.d.). The remaining national parks were added primarily in the 1960s and 1970s. By contrast, only five national reserves were established between 1948-1973, with the majority being legally created in the 1970s and 1980s (Thorsell and Pertet, n.d.). Terrestrial national parks, national reserves and local sanctuaries cover a total area of about 4.4 million ha, which represents 7.6% of the total area of the country (WCMC, 1991).

Existing national parks and wildlife reserves represent 12 out of the 19 natural areas identified for Kenya, excluding a large section of the marine region. It is recognised, however, that the largest proportion of these protected areas (74%) are found in arid and semi-arid regions (Pertet, n.d.). The seven natural areas with limited protection in either national parks or reserves are: Guineo-Congolese rain forest; highland evergreen bushland; alkaline/volcanic ash; coastal forest and woodland; coastal palm woodland; freshwater lakes; and marine beaches and sand dunes (Pertet, n.d.). Recommendations, many of which are based on Lamprey's (1974) review, to expand the protected areas network to include these areas are found in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). Following from this, KWS, as part of its

"Policy Framework and Development Programme 1991-96", will promote the gazettement of a number of parks and reserves in order to create a national network of protected areas and is developing a protected area systems plan (KWS, 1990). Further, the conservation of wildlife outside national parks and reserves is of major importance to KWS. To facilitate this, neighbourhood groups, wildlife management units and a Wildlife Coordinating Committee will be established to manage wildlife in communally owned areas. These groups and their associated activities will form part of the "Community Wildlife Programme". To implement this programme, a Community Wildlife Service will be incorporated within the organisational structure of KWS (KWS, 1990).

Following British control of Kenya in 1895, the first forest reserves and eucalyptus plantations were established in order to ensure a supply of fuel for wood-burning locomotives, among other purposes (Kokwaro, 1984). Today, there are 231 gazetted natural forests, 105 of which are on government land and 126 on trust land. In total, gazetted forests cover 1,662,276ha or about 2.9% of total area (Forest Department, pers. comm., 1991). Gazetted forests are managed either as production forests (for output of wood products) or protection forests (for maintaining watershed, fauna, and flora). It has been estimated that about 955,200ha are indigenous forests serving a protection function (Omollo, pers. comm., 1991). Within production forests, about 165,000ha (10% of the total) have been converted to industrial plantations, while 53,000ha (3% of the total) have been protected as nature reserves (World Bank, 1988). As of 1989, management plans covered only about 20% of indigenous forest (ERL, 1990).

In the forestry subsector review, it was recommended that an additional 500,000ha of forest land (22% government and 78% trust land) be gazetted and therein protected; a detailed forest inventory be conducted; market surveys be undertaken to allow for effective planning; and national and individual gazetted forest management plans be prepared (World Bank, 1988). Following the subsector review, a substantial component of the current World Bank forestry project, funded by ODA, is centered around natural forest conservation. Under this programme, the Finnish International Development Agency (FINNIDA) is funding the Kenya Forestry Master Plan project.

As a result of there being relatively few areas of gazetted coastal forest and with all ungazetted areas being under extreme threat by an increasing population and their demand for land and fuel wood, a coastal forest project commenced in 1988. The two goals of this project are to document the current status of these forests and to develop protection strategies for them (WWF, 1991c). A closer working relationship between KWS and the Forest Department is being promoted in support of these recent initiatives.

There are reports of heavy encroachment and over-exploitation of many forest areas and other biotic communities. Population increase, coupled with agricultural encroachment, shifting cultivation, cattle grazing, unlicensed timber extraction for building poles and charcoal, intensive logging, illegal settlement, the conversion of indigenous forest to plantations, subsistence hunting, legal degazetting of forest land for conversion to other types of land use, and rapid industrialisation are threats to the forest resource, both within and around various forest reserves (ERL, 1990; Fayad, n.d.; Kokwaro, 1984; Kundaali, 1983; Young, 1984). Elephants and monkeys also pose a threat to forests (IUCN, 1983).

During times of drought, domestic stock have made use of water sources in such protected areas as Amboseli, Kora and Tsavo West national parks (Coe, 1985; Stiles, 1988; Olindo, pers. comm., 1991). Irrigation and damming schemes, poaching, uncontrolled bushfires, invasion of alien plant species, and tourism impacts have also posed threats to the integrity of various protected areas (Marsh, 1985; Pertet, 1982; Thorsell, 1980).

Other Relevant Information Since 1987, tourism has been the largest foreign exchange earner in the country, with KWS receiving KSh 130 million in 1990 (Mburugu, pers. comm., 1991).

Addresses

- Kenya Wildlife Service (Director), Ministry of Tourism and Wildlife, Langata Road, PO Box 40241, NAIROBI (Tel: 501081)
- Forest Department (Director), Ministry of Environment and Natural Resources, Kencome House, PO Box 30513, NAIROBI (Tel: 2 229261; FAX: 2 340260)
- National Museums of Kenya (Chairman), Ministry of Constitutional Affairs, PO Box 45168, NAIROBI
- African Wildlife Foundation (Senior Associate), Embassy House, PO Box 48177, NAIROBI (Tel: 2 331542/3; 223235; Cable: ELEPHANTS; Tlx: 22152 AWF KE; FAX: 2 332294)
- The East African Wildlife Society (Executive Director), 1st Floor, Caltex House, Koinange Street, PO Box 20110, NAIROBI (Tel: 337047/337422/337423)
- Africa (NGOs) Environment Network (ANEN), c/o ELC, PO Box 72461, NAIROBI (Tel: 24770; Tlx: 22240 ENVICENTRE)

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Forests Act

Date: 1942, last amended 1982

Brief description: To provide for the controlled utilisation of forests and the establishment of reserve areas.

Administrative authority: Forest Department (Director)

Designations:

Forest area or Central forest Prohibited activities include: the taking, burning, injuring or removal of any forest produce; residing in such areas overnight; the erection of any building or cattle enclosure; the setting of fires to any grass, undergrowth or forest produce; the grazing of cattle; the clearing or cultivating of land; the capturing or killing of any animals unless authorised by a valid licence issued under the Wildlife (Conservation and Management) Act; the construction of any road or path; and the collection of any honey or beeswax, without first acquiring a licence from the Director of Forestry.

Timber, firewood, stone, withies and asparagus fern may be taken under licence according to the Forests (General) Rules.

Nature reserve These are areas which are found within forest reserves, and are declared for the purpose of preserving the natural amenities thereof and the flora and fauna therein and no exploitation is allowed within them.

Prohibited activities include the cutting, grazing, removal of forest produce or disturbance of flora, except with the permission of the Chief Conservator (now Director) and authorisation is only granted on conservation grounds.

Hunting, fishing and the disturbance of fauna is prohibited except where it is considered necessary or desirable to take or kill any species.

Unalienated government land This is land which is vested in the Government but has not been legally gazetted.

Prohibited activities include the felling, cutting, taking, burning, injuring or removal of any tree; the collection of honey or beeswax; and the lighting of fires in the vicinity of a forest area or Central Forest, without first obtaining a licence from the Director of Forestry.

Source: Original legislation; ERL, 1990

Title: Wildlife (Conservation and Amendment) Act

Date: 1976, last amended 1989

Brief description: Concerning the protection, conservation and management of wildlife, and the establishment of national parks, national reserves local sanctuaries and protection areas.

Administrative authority: Kenya Wildlife Service (KWS) (Director)

Designations:

National park Prohibited activities in such areas include: hunting; being in possession of any weapon or trap; cutting, injuring or setting fire to any vegetation; collecting or attempting to collect any honey or beeswax; the wilful damage or removal of any object of geological, prehistoric, archaeological, historic, marine, or scientific interest; the introduction of any animal or vegetation; the clearing or cultivating of any land; deliberately disturbing animals; and the catching or attempting to catch any fish without prior authorisation.

It is an offence to search for or remove any minerals from such areas, except with the written consent of the Minister.

No one may enter a park at night and all driving and stopping should use recognised tracks and stopping places.

Marine national park The flora and fauna is totally protected in such areas. Passage and anchorage of boats is permitted but a free permit must be obtained for the period required. Certain other activities such as swimming, water skiing and sailing are allowed.

Prohibited activities include: any disturbance, removal, collection, or introduction of plants,

animals, rocks, or minerals above or below the surface of the sea; diving without an appropriate permit; spearfishing; collecting shells or corals; entering or residing in such areas without authorisation; being in possession of any weapon, explosive, trap or poison; setting fire to any vegetation; clearing or cultivating any land; catching or attempting to catch any fish; and collecting any honey or beeswax in such areas.

National reserve Land uses other than nature conservation may be specifically allowed; the conditions controlling such uses are included in regulations agreed to by the authority at the time of gazettelement.

Exploitation in the form of seasonal water rights and grazing by pastoralists is usually permitted in such areas.

Marine national reserve Passage and anchorage of boats is permitted but a free permit must be obtained for the period required. Certain other activities such as swimming, water skiing and sailing are allowed.

Prohibited activities include: the collection of shells or corals; diving without an appropriate permit; and fishing by poison, speargun or dynamite. Only specified traditional methods of fishing are allowed.

Local sanctuary These areas perform the function of protecting locally significant resource features from disturbance, primarily hunting.

Vegetation is not protected in such areas.

Protection area Adjacent to national parks, national reserves or local sanctuaries and are legally declared to ensure the security of the animal or vegetable life, or the habitat and ecology of these protected areas.

Sources: Original legislation; ERL, 1990; Brakel, 1978; Thorsell and Pertet, n.d.

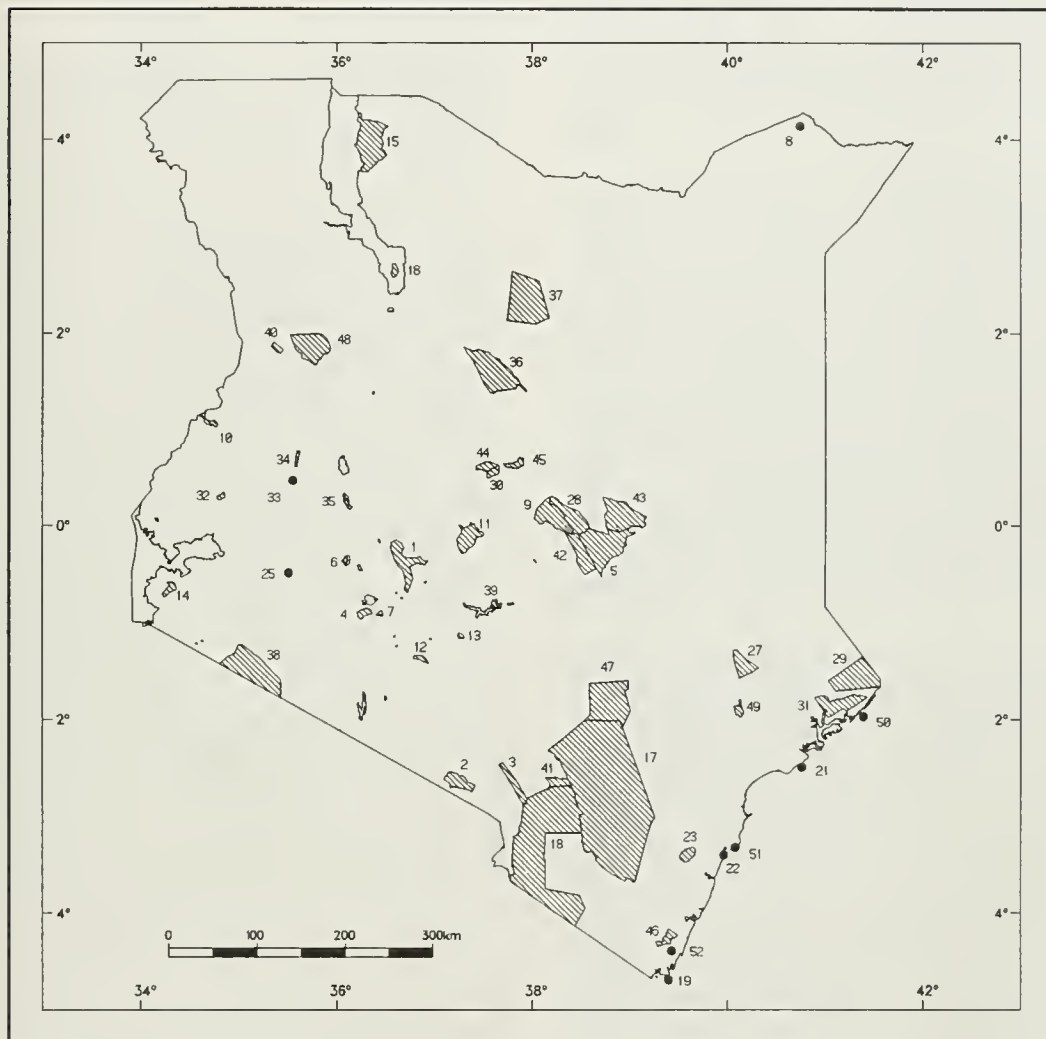
SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Aberdare	II	76,619	1950
2	Amboseli	II	39,206	1974
3	Chyulu	II	47,090	1983
4	Hell's Gate	II	6,800	1984
5	Kora	II	178,780	1989
6	Lake Nakuru	II	18,800	1967
7	Longonot	II	5,200	1983
8	Malka Mari	II	87,600	1989
9	Meru	II	87,044	1966
10	Mount Elgon	II	16,923	1968
11	Mount Kenya	II	71,759	1949
12	Nairobi	II	11,721	1946
13	Ol Donyo Sabuk	II	1,842	1967
14	Ruma	II	12,000	1983
15	Sibilo	II	157,085	1973
16	South Island	II	3,880	1983
17	Tsavo East	II	1,174,700	1948
18	Tsavo West	II	906,500	1948
	<i>Marine National Parks</i>			
19	Kisite/Mpunguti	II	3,900	1978
20	Mombasa	II	1,000	1986
21	Ras Tenewi	II	35,000	1991
22	Watamu	II	3,200	1968
	<i>Nature Reserves</i>			
23	Arabuko Sokoke	IV	4,332	1979
24	Nandi North	IV	3,434	1978
25	South-Western Mau	IV	43,032	1961
26	Uaso Narok	IV	1,575	1981
	<i>National Reserves</i>			
27	Arawale	VI	53,324	1974
28	Bisanadi	VI	60,600	1979
29	Boni	VI	133,900	1976
30	Buffalo Springs	II	13,100	1985
31	Dodori	VI	87,739	1976
32	Kakamega	II	4,468	1985
33	Kamnarok	VI	8,774	1983
34	Kerio Valley	IV	6,570	1983
35	Lake Bogoria	II	10,705	1970
36	Losai	VI	180,680	1976
37	Marsabit	II	208,800	1949
38	Masai Mara	II	151,000	1974
39	Mwea	VI	6,803	1976
40	Nasolot	VI	9,200	1979
41	Ngai Ndethya	VI	21,209	1976
42	North Kitui	VI	74,500	1979
43	Rahole	VI	127,000	1976
44	Samburu	II	16,500	1985
45	Shaba	II	23,910	1974
46	Shimba Hills	II	19,251	1968
47	South Kitui	VI	183,300	1979
48	South Turkana	VI	109,100	1979
49	Tana River Primate	II	16,900	1976

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>Marine National Reserves</i>				
50	Kiunga	VI	25,000	1979
51	Malindi	VI	21,309	1968
52	Mombasa	VI	20,000	1986
53	Mpunguti	VI	1,100	1978
54	Watamu	VI	3,200	1968
<i>Biosphere Reserves</i>				
	Amboseli	IX	483,200	1991
	Kiunga Marine National Reserve	IX	60,000	1980
	Malindi-Watamu	IX	19,600	1979
	Mount Kenya	IX	71,759	1978
	Mount Kulal	IX	700,000	1978
<i>Ramsar Wetland</i>				
	Lake Nakuru National park	R	18,800	1990

[†]Locations of some protected areas are shown on the accompanying map.

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Kenya

LESOTHO

Area 30,350 sq. km

Population 1,800,000 (1990)

Natural increase: 2.8% p.a.

Economic Indicators

GDP: US\$ 223 per capita

GNP: US\$ 410 per capita

Policy and Legislation One of the most important pieces of early legislation allowing for the declaration of protected areas, passed while under British colonial rule, was the Game Preservation Proclamation No. 33, 1951 which provided for the creation of wildlife sanctuaries, although these were poorly defined (McVean, 1977).

Current legislation includes the National Parks Act, gazetted in 1975, which provides for the designation and maintenance of national parks. It also allows for the conservation of wild animal and fish life; the preservation of vegetation and objects of historical or scientific interest and for the enjoyment of visitors to such parks; and provides for the control, management and maintenance of such parks and for incidental matters. Legal notice of commencement of this Act, however, was only given on 29 June 1987 by the Minister of Agriculture, Cooperatives and Marketing and, on the same day, the National Parks (Amendment) Order was passed. National parks are to be declared by the King on advice from the Minister. The Act contains detailed provisions for the establishment of a Lesotho National Parks Board of Trustees and covers penalties for the breaking of the regulations covered in the Act (Annex). Areas can also be set aside under the Historic Monuments, Relics, Fauna and Flora Act 1967: this Act provides for the protection of flora and fauna and for the preservation of natural and historic monuments, relics and antiques. It also established the Protection and Preservation Commission. Under this Act, the Minister of Education may, on the recommendation of the Commission, proclaim certain sites as monuments. Section 10 of the Act lays down the penalties for removal, destruction or damage to protected flora and fauna (Annex) (McVean, 1977).

The Forest Act No. 11 was passed on 6 September 1978 and provides for the creation of forest reserves, some of which may be of conservation value. These may be declared by the King on land held by the government, or on other land upon the written request of the appropriate land authority after examination by the Chief Forest Officer. A certain percentage of the monies received from a forest reserve may be allocated to the community of the surrounding area (Annex).

The Land Husbandry Act 1969 is also of importance for conservation purposes. It provides for the management of trees and other natural flora; the control of grazing and the introduction of veld management; regulation of the

numbers and species of livestock on designated land; the prohibition or restriction of cultivation on designated land (including a number of different types of wetlands) and the prescription of anti-erosion measures on such lands (McVean, 1977).

An environmental conservation bill proposed in 1977 inserts clauses allowing for the formation of an environmental survey or biological inventory, and extending the powers of the National Parks Board to cover all categories of protected area: "national parks, nature reserves, game parks, conservation areas, scenic, geological, historical and cultural sites" (McVean, 1977).

International Activities At an international level, Lesotho is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Lesotho is a signatory to the African Convention on the Conservation of Nature and Natural Resources (Africa Convention), although it has not yet deposited an instrument of ratification. There is some transboundary cooperation with the Republic of South Africa concerning the management of natural resources important to both countries, including border parks; the National Parks Board has been particularly involved.

Administration and Management Administration of the one existing national park has been passed around several bodies in central government, mostly within the Lesotho Ministry of Agriculture, Cooperatives and Marketing. Responsibility for this area now resides with the Range Management Division within this Ministry. By virtue of the 1975 National Parks Act, detailed provisions for the establishment of a Lesotho National Parks Board of Trustees were outlined, although such a Board has not yet been created, despite recommendations and the obvious need for such a body (McVean, 1977). Under the provisions of this Act, the National Parks Board of Trustees will be responsible for controlling, managing and maintaining national parks; for undertaking steps to ensure the preservation and security of animals and vegetation, for setting aside portions of the park for the breeding of animals or as nurseries for vegetation; and for establishing amenities for visitors.

Forest reserves are managed by the Forestry Division of the Ministry of Agriculture, Cooperatives and Marketing, as laid down in the 1978 Forest Act. According to the terms of this Act, the Forestry Division is responsible for the demarcation of reserves, the construction of roads, paths, bridges and culverts, and all

activities associated with the exploitation, management, maintenance and control of forests, including the construction of facilities associated with forestry activities. The Chief Forest Officer is responsible for issuing licences for various restricted activities in forest reserves.

There are no major national non-governmental conservation organisations. However, the Southern Africa Nature Foundation (WWF-South Africa) presumably covers Lesotho, although it has not supported any major projects in this country (WWF, 1988).

Systems Reviews Lesotho is a small, land-locked country entirely surrounded by the Republic of South Africa: the Province of Orange Free State lies to the north and west, Natal to the east and Cape Province to the south; the "independent" state of Transkei also has a long border with Lesotho in the South, and the semi-independent homeland of Qwa-Qwa in the north-east.

The eastern two-thirds of the country are mountainous, rising to 3,482m, while the western third is lower-lying, marked by many deeply cut valleys, and is much drier than the east: the lowest parts of the country are still over 1,250m. The higher mountain areas, above 2,300m, are of volcanic origin and overlay sedimentary strata that make up the remainder of the country. The mountainous ridge on the north and north-eastern borders with South Africa is known as the Drakensberg Range, while the main range of mountains running into the north/centre of the country from the north-east is known as the Maluti Mountains. Leading south-eastwards from the latter is another ridge of mountains known as the Central Ranges. Erosion has produced an extremely rugged and broken country with high relief and few level surfaces. Most of the country is drained by the Caledon and Orange rivers and their tributaries, the Caledon in the north, forming the entire north-western boundary of Lesotho, and the Orange in the south (Bainbridge *et al.*, 1989; Hilty, 1982).

Most of the natural vegetation consists of grassland communities; parts of this landscape are influenced by seasonal fires, both natural and man-induced, and there is evidence that at least some of these may be fire-limited sub-climax communities. At least three major grassland associations have been described. The highest peaks in the east are dominated by alpine heathlands and montane grassland, with a high proportion of endemics, which grade into temperate and then subtropical grasslands as the altitude decreases. The lowest slopes have some shrubland with false karroid affinities. In addition to grassland, evidence suggests that parts of the lowlands were occupied by open savanna woodland and riverside willow thickets until the early parts of the 19th century. Denser woodlands also occurred in some areas such as scarp slopes, valleys and sheltered depressions; communities of this type extended up to some 2,000m. Above this there were some areas of montane scrub

woodland. The use of timber for fuel and the increased incidence of fires since the 19th century has led to the loss of most of this woodland vegetation. Most of the low-lying areas in the west are now under arable cultivation. There are extensive bogs and spongelands in the high rainfall areas of the mountains, particularly in the higher basaltic areas. The diversity of fauna is limited by the harsh physical conditions, the small size of the country and the limited range of habitat types (Bainbridge *et al.*, 1989; Hilty, 1982; Hughes and Hughes, 1991). The biogeographic affinities are Afromontane with Kalahari-Highveld in the lower lying areas of the west (Stuart and Adams, 1990).

Most of the population lives in the lowlands where there is intense pressure on land from cultivation: this in turn has led to severe soil erosion and decreased productivity, such that the country is no longer self-supporting and a large proportion of the labour force is employed in the South African mining industry. The system of land tenure is thought to be at the root of many of the problems of overgrazing and soil erosion: all land is held in trust for the nation by the King; residential rights may be obtained by married males and with these come seasonal user rights for as many as three arable fields. These private land rights only exist for the duration of the growing season, after which all land reverts to the national trust. Grazing rights on all land not cultivated are communal, and no upper limits are placed on the number of livestock owned or permitted to graze an area. Some changes to this system were introduced with the 1979 Land Act, but the basic system remains unchanged (Hilty, 1982).

The Historical Monuments, Relics, Flora and Fauna Act, 1967 was first invoked in 1969 to proclaim nine sites as protected areas, at least some of which were of historical rather than natural interest. Sehlabathebe was first declared as a wildlife sanctuary in 1970 and it quickly became known as Sehlabathebe National Park, although it still remains unclear as to whether its legal status has been upgraded. The government commissioned a report on nature conservation in the 1970s which made recommendations for improving national parks organisation and giving more areas protected status (McVean, 1977). The report suggested that a large area, Lesotho National Park, be set aside, to include Sehlabathebe Nature Reserve. Three other proposed national parks were reviewed, two new reserves suggested, and five smaller sites considered, most of which were in the mountainous regions. In particular, it was emphasised that national parks in the usual African style would not be appropriate in Lesotho as the country has neither the wide uninhabited spaces, the big game, nor many of the necessary communications, all of which are characteristic of South African parks (McVean, 1977). To date, most of the recommendations of this report have not been taken up. The designation of large protected areas in the lowlands is seen as impractical, due to high population densities and intense pressure for agricultural land (MacKinnon and MacKinnon, 1986).

Proposals to improve the protected area system are also given in MacKinnon and MacKinnon (1986) and IUCN (1987). These support the proposals suggested by McVean (1977) for expanding the protected areas network.

The ongoing Drakensberg/Maluti Mountain Catchment Conservation Programme is an inter-governmental project, largely staffed by members of the Range Management Division of the Lesotho Ministry of Agriculture and the Natal Parks Board. The Programme aims to form a long-term environmental protection plan for the eastern Maluti Mountains, an area of some 2,000 sq. km which makes up a major part of the watershed for the Orange River, of major importance to both countries. There are proposals to expand the area covered by the programme to include the entire eastern Alpine zone. A reconnaissance survey for the Programme was completed by the end of March 1989. Proposals resulting from this stage of the Programme included the declaration of the study area as a managed resource area, and to seek World Heritage Status for the area (Bainbridge *et al.*, 1989).

Addresses

Lesotho National Parks, Conservation Division,
Ministry of Agriculture, Cooperatives and
Marketing, PO Box 92, MASERU
Forestry Division, Ministry of Agriculture, Cooperatives
and Marketing, PO Box 92, MASERU

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: National Parks Act, 1975 (Act No. 11);
National Parks (Amendment) Order 1987

Date: Assent: 21 August 1975; Commencement:
29 June 1987, with the National Parks (Amendment)
Order of the same date

Brief description: Allows for the establishment of
national parks

Administrative authority: Range Management
Division, Ministry of Agriculture, Cooperatives and
Marketing

Designations:

National park No person may hunt, disturb or
collect any animal, egg, nest or vegetation within a
park without a permit signed by the chairman of the
Board. Further regulations may be made by the

Minister, after there has been consultation with the
Board, concerning such aspects as visitors fees,
weapons taken into parks, photography, the lighting
of fires, the introduction of wild or domestic animals,
damage to vegetation, and fencing within the park.
No prospecting or mining for minerals shall be
carried out within a national park, except with the
consent in writing of the Minister after consultation
with the Board.

Source: National Parks Act 1975

Title: Forest Act (Act No. 11)

Date: 6 September 1978

Brief description: To provide for the planting of
forests; for the establishment, management,
maintenance and control of forest reserves; for the

taking and removal of forest produce; and for connected purposes.

Administrative authority: Government Forestry Division (Chief Forest Officer)

Designations:

Forest reserve No person may reside in, allow livestock to trespass, cultivate or illegally enter a forest reserve; fires are also prohibited. The removal of forest produce, including the cutting of timber, and the grazing of livestock is also prohibited without a licence.

Source: Original legislation

Title: Historical Monuments, Relics, Fauna and Flora Act (Act No. 41)

Date: 1967

Brief description: Establishes a Commission for the preservation of natural and historical monuments, relics and antiques and the protection of flora and fauna. Provides for the designation of natural and historical monuments by the Minister of Education.

Administrative authority: Protection and Preservation Commission

Designations:

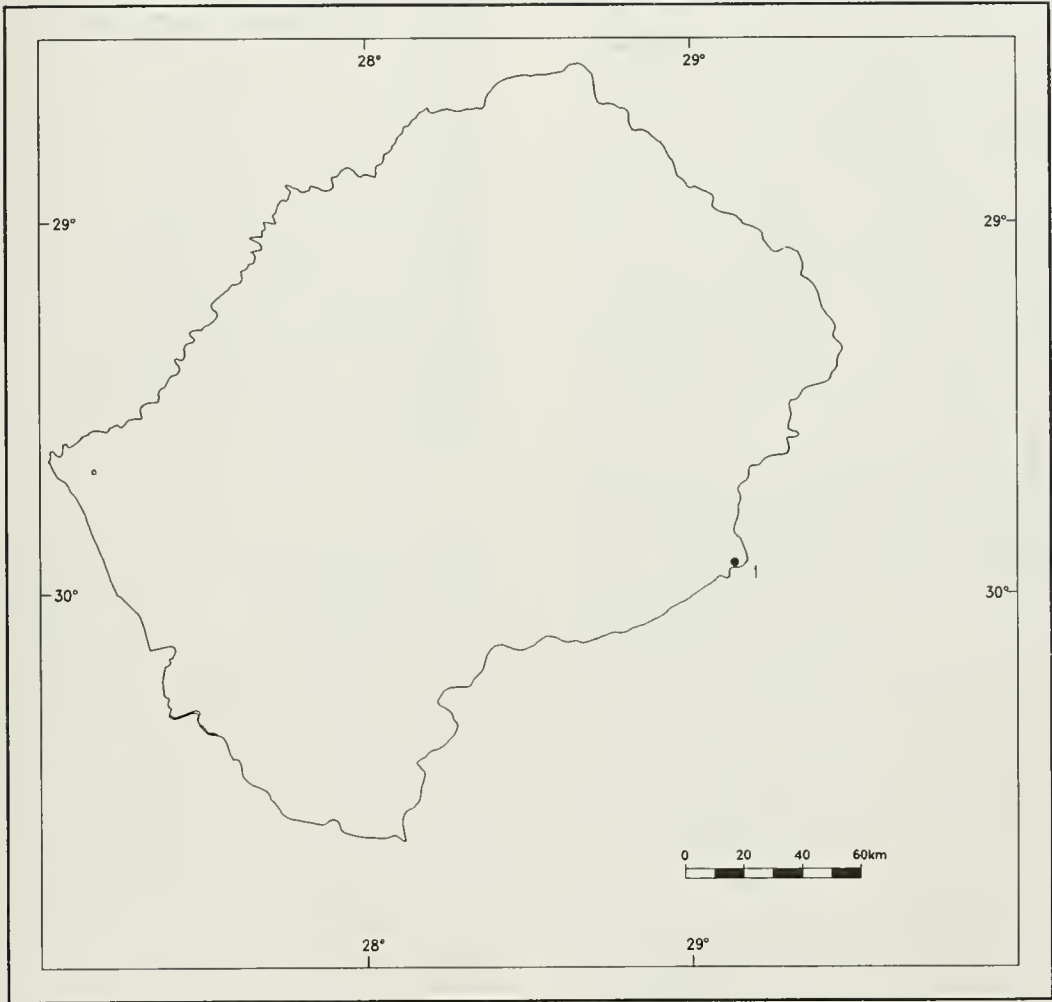
Monument These are sites to be proclaimed on recommendation by the Commission. They may be areas of land having distinctive or beautiful scenery or geological formations, areas containing a rare, distinctive or beautiful flora or fauna, areas containing objects of archaeological, historical or scientific interest, or any waterfall, cave, grotto, avenue of trees, building or other object (whether natural or constructed by man) of aesthetic, historical, archaeological or scientific interest.

Source: McVean (1977)

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
I	<i>National Park</i> Sehlabathebe	IV	6,805	1970

Category VIII forest reserves are neither listed nor mapped.



Protected Area of Lesotho

LIBERIA

Area 111,370 sq. km

Population 2,575,000 (1990)

Natural increase: 3.26% per annum

Economic Indicators

GDP: US\$ 467 per capita (1987)

GNP: US\$ 450 per capita (1988)

Policy and Legislation Early legislation allowing for the establishment of forest reserves and conservation areas included "An Act for the Conservation of the Forests of The Republic of Liberia", approved on 17 April 1953, and the accompanying "Supplementary Act for the Conservation of the Forests of the Republic of Liberia", approved on 28 February 1957. Together, these acts provided the framework for the use of forests and wildlife resources and allowed for the creation of government forest reserves, native authority forest reserves, communal forests, national parks, and wildlife refuges (see Annex). The 1953 Act also created the Bureau of Forest Conservation, and outlined the duties and powers of forest officers, while the 1957 Act was extensive in outlining rules and regulations pertaining to the various protected area categories, specified offences and accompanying penalties, made provision for the management of revenues and receipts from forest reserves, and dealt with the issue of concessions.

The 1953 and 1957 Acts, and Chapters 1-4 of the National Resources Law, dealing with the Bureau of Forest Conservation, the conservation of forests, national parks, and the conservation of wildlife, were repealed by "An Act Creating Forestry Development Authority" (Act No. 10), approved on 1 November 1976 and published on 20 December 1976. Enactment of this legislation did not, however, affect the various categories of reserve created by the earlier laws (Peal, pers. comm., 1991). The 1976 Act defined the powers and responsibilities of the Forestry Development Authority (FDA), outlined offences and accompanying penalties in connection with the Act, made provision for the establishment of an Advisory Conservation Committee, and specified the powers of forest officers with regard to trees in reserve areas (see Annex).

In an attempt to update and revise earlier legislation, especially with respect to wildlife conservation, the Wildlife and National Parks Act was enacted in 1988 (Stuart and Adams, 1990). This Act identifies a number of protected areas: national park; nature reserve; controlled hunting area; game reserve; and communal forest (Annex). In addition, the Act specifies the policies and objectives regarding wildlife conservation in the country. Policy objectives include, *inter alia*: the management of wildlife and natural areas for the benefit, utilisation and enjoyment of all people in accordance with principles of ecologically based management; the preservation of outstanding scenic, natural, scientific,

recreational, and other value through the establishment of protected areas; the conservation of wildlife as a source of protein, revenue and employment; and, the promotion of conservation education. The Act also establishes the powers and responsibilities of the Forestry Development Authority; allows for the creation of an Advisory Committee to assist in undertaking surveys, scientific research, and the issuing of hunting regulations; and outlines regulations with respect to hunting licences, methods of hunting, protected animals, international trade, and offences and accompanying penalties in association with the Act. The 1989 draft regulations to the 1988 Act include procedures for the declaration of new protected areas, propose major interventions in area management, including the declaration of the entire country as a controlled hunting area, prohibit hunting in national forests and game reserves, and cover aspects of internal and international trade (Anstey, 1991b; McHenry, 1989; Stuart and Adams, 1990). It has been recommended that the 1988 Act be retained when stability returns to the country and that redrafted regulations to the Act be rapidly formulated (Anstey, pers. comm., 1991). In mid 1988, all hunting was prohibited by Presidential decree (Anstey, 1991b).

Liberia's national conservation strategy has identified four long-range conservation goals: protection of prime catchment and watershed lands; preservation of diverse biotic communities of tropical lowland rain forest; conservation of critically endangered populations and/or species; and, establishment of a nationwide system of habitat protection (FDA/IUCN, 1986). Five basic approaches are considered necessary for achievement of these goals: nationwide ecological surveys to identify suitable areas for protection; public awareness and education campaigns; staff development programmes; increased public involvement; and the development of appropriate wildlife regulations (FDA/IUCN, 1986). The development of Sapo National Park is seen as a key step in the framework of Liberia's conservation strategy.

International Activities Liberia is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Liberia has ratified the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The Bureau of Forest Conservation, within the Ministry of Agriculture, was responsible for forest conservation and the creation of reserve areas until it was replaced by the Forestry

Development Authority (FDA) in 1976. The Authority is responsible, *inter alia*, for: establishing a permanent forest estate made up of reserved areas upon which scientific forestry is to be practised; devoting all publicly-owned forests to their most productive use for the good of the whole people considering direct and indirect values; conducting research into the conservation of forests upon which action programmes can be based; and conserving recreational and wildlife resources concurrently with the development of the forestry programme. Under its mandate, the FDA is entitled to create and manage forest reserves and national parks; to adopt rules as required for the implementation of its policies and objectives; to issue, amend and rescind forestry regulations; to enforce laws and regulations on the conservation and development of forest resources; and to operate as a business corporation by engaging in commercial undertakings (Schmithüsen, 1986). The Authority is an autonomous public corporation comprised of a management team led by a Managing Director.

Forestry administration in the country is divided into four regions (numbered I-IV), with each region being divided into a number of districts depending on its size. Each forest region is headed by a regional forest officer and each district by a district forest officer (FDA/IUCN, 1986). Within FDA is found a Forest Protection Section which was set up in 1987, and in 1989 had 110 forest guards, or one guard for every 127 sq. km of forest (Mayers, 1989). This section is responsible for the protection of national forests from settlement and hunting (Anstey and Dunn, 1991). FDA policies are formulated by a Board of Directors, which is mainly composed of government ministers, with the Minister of Agriculture as *ex-officio* Chairman.

Within the Forestry Development Authority (FDA) is a Wildlife and National Parks Section, which is concerned with the establishment and management of protected areas; the development and implementation of management plans; the development of a viable wildlife conservation programme; the drawing up of wildlife regulations; the promotion of conservation education and a public relations campaign throughout the country, and for carrying out the general provisions of the 1988 Wildlife and National Parks Act (Forestry Development Authority, 1988; Kundaali, 1985). In late 1989, the Wildlife Section had a staff of 40, 32 of which were based at Sapo National Park (Anstey and Dunn, 1991).

It has been recommended that the Wildlife and Parks Section be upgraded to the Division of Wildlife and Parks, with a concurrent increase in legal powers (Kundaali, 1985; MacKinnon and MacKinnon, 1986). The proposed organisation of this division would include a Board of Directors, Managing Director and Manager of Wildlife and National Parks. Responsible to the Manager would be the Head of the Wildlife Conservation Section and the Head of the National Parks Section, the latter section being supported by a chief game warden and park wardens in charge of law

enforcement, planning and management, and education and public relations. The organisation would be supported by a National Advisory Committee on Wildlife and National Parks and by local advisory committees (FDA/IUCN, 1986; Kundaali, 1985).

The Society for the Conservation of Nature of Liberia (SCNL), which was established in 1986, had been successful in implementing a number of field projects and was an effective advocate for conservation prior to the civil war (Mayers, 1991). The infrastructure of SCNL included a Board of Directors and a paid Secretariat, volunteers, and an office (Anstey and Dunn, 1991). The leading international organisation in Liberia was WWF, which provided funds and support for a number of conservation projects and programmes. The University of Liberia is a local institution which trains graduates in natural resources management.

There are a number of constraints facing the management of protected areas in the country. These include: political instability; a seriously weakened organisational infrastructure; a lack of financial and logistical support; and a low number and poorly trained staff (Anstey and Dunn, 1991; Kundaali, 1985; MacKinnon and MacKinnon, 1986; Robinson, 1982). The Wildlife Section of FDA had a restricted power base within the FDA structure, in relation to conflicts between timber production and conservation goals, and was limited in its ability to influence key state institutions and power structures (Anstey, 1991b).

Systems Reviews Liberia is a small West African country bordered by Sierra Leone, Guinea, Ivory Coast and the Atlantic Ocean to the west. It has a coastline of 500km and extends from coastal lowlands, through rolling hills, dissected inland plateaux (up to 300m in altitude) and low mountains (up to 600m), to the highlands of the Wologizi Range (up to 1,350m) in the north and the Nimba Range (up to 1,385m) in the north-east (IUCN, 1982; Peal and Kranz, 1990). Closed forest, which covers almost 50% of the land area, consists of evergreen forests in the wetter south and central areas of the country and moist semi-deciduous forests are found in the drier north-western parts. There is also a small area of montane forest on Mt Nimba (Mayers, 1991). Liberia contains the two most substantial blocks of closed forest in the Upper Guinean Forest (Mayers, 1991). Other vegetation types found in the country include: farmland and regrowth, covering 47%; and a limited coverage of mangrove (0.2%), plantations (1.7%), non-forested swamp (0.1%), savanna (0.2%) and grassland (0.2%) (FDA/IDA, 1985). The biogeographic affinities are Guinea-Congolian with Afromontane elements on Mount Nimba (Stuart and Adams, 1990).

The people of Liberia are primarily subsistence farmers, hunters and fisherman, although land use activities have diversified in the past four decades to include logging and cash crop production (FDA/IUCN, 1986). Prior to the impact of man, Liberia was almost entirely covered

by tropical moist forest (Anstey, 1991a). Today, deforestation is proceeding at a rate of about 2% per year, primarily as a result of shifting agriculture (Mayers, 1991).

Liberia does not have extensive coastal wetlands, although mangroves are found at all river mouths (Hughes and Hughes, 1991). Numerous swamps, however, are found in the valley bottoms of the interior plateau (Peal and Kranz, 1990). The major rivers which flow in parallel across the country from north-east to south-west are the Mano, Lofa, St Paul, St John, Cestos and Cavalla (Cavally) (Hughes and Hughes, 1991). Currently, mangroves are not protected, although the proposed national park at Cape Mount would include this habitat. Mangroves are under threat from hunting and fishing pressures and for fuel wood exploitation (Mayers, 1991).

Until 1953, little had been done with respect to forest conservation. In that year, however, presidential declarations classified a number of forests as national forests. They covered more than 16% of the country's land area, and, although well chosen, received minimal protection (Mayers, 1991). Following a period in the 1970s and early 1980s when protected areas existed on paper only, the FDA initiated a major effort to redemarcate the national forests, using funds generated by a "conservation tax" on logging (Mayers, 1991; Verschuren, 1983). By 1989, the resurveying and cleaning of boundary lines was completed for a number of national forests. In early 1990, the FDA embarked upon a Tropical Forestry Action Plan for Liberia. One of the objectives was to link local land-use management units to national forests, allowing the units to formulate and implement management plans with the FDA (FAO, 1990).

Early attempts at developing a comprehensive wildlife conservation plan were initiated by Curry-Lindahl in the late 1960s and early 1970s (Kundaeli, 1985). In his review of conservation in Liberia, Verschuren (1983) built on earlier proposals to establish national parks at Tiempo, Bokumu, and Wologizi, by recommending that Sapo, Loffa-Mano, and Cestos-Senkwen be established as national parks and Mount Nimba, Cavally Valley, Mount Wonegizi, and Cape Mount be protected as nature reserves. Subsequently, the 1980s witnessed a rapid development of conservation with the establishment of Sapo National Park (1983) in an area of lowland rain forest, the development of a conservation infrastructure, and clarification of conservation goals and policies (Anstey, 1991b). In 1987, the Society for the Conservation of Nature of Liberia (SCNL), together with WWF and funding from US-AID, initiated a programme to implement agricultural assistance (Sapo Agriculture Project) to areas around Sapo National Park. The objectives of the WWF/FDA Wildlife Survey of Liberia, initiated in 1989, were, *inter alia*: to conduct a nationwide survey of large mammal populations and their use upon which to base decisions regarding hunting regulations and the creation of further protected or

managed areas; and the training of FDA rangers and officers (Peal and Kranz, 1990; Stuart and Adams, 1990).

Today, ten national forests exist and cover about 1.4 million ha. Together, these national forests and Sapo National Park, which are found primarily in closed forest, protect about 14% of the total area of the country and 30% of the closed forest (Mayers, 1991).

Certain priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986), IUCN (1987), and Stuart and Adams (1990). Areas currently being considered for conservation status include Cape Mount, Loma and the Wologizi-North Lorma-Wonegizi area (Anstey and Dunn, 1991; Stuart and Adams, 1990). Other suggestions have included: the establishment of conservation areas with specific core areas (national park/nature reserve) given full protection, surrounded by more extensive areas for multiple use (game reserve/controlled hunting area/national forest) where regulated wildlife use is permitted; improved management and the development of management plans for all national forests, recognising both conservation and human needs; the development of a national strategy for sustainability based on a national land use policy and land tenure review; cooperative protected area management with neighbouring countries; and a review of coastal fisheries and the marine environment to assess possible conservation action (Anstey, 1991b; Curry-Lindahl, 1969; IUCN, 1987; Mackinnon and Mackinnon, 1986; Stuart and Adams, 1990). Further, there has been an overall proposal for incorporating all national forest areas into a game reserves system and the government has, in the past, requested international assistance with the preparation of a National Systems Plan (MacKinnon and MacKinnon, 1986; Peal and Kranz, 1990).

Pressures on Sapo National Park include logging concessions around the park and hunting, although neither represents a significant threat (Anstey and Dunn, 1991). Rural development projects around the park and general acceptance of its existence have helped to minimise potential conflicts. The national forests receive little protection and are threatened by: settlement encroachment; shifting cultivation; mining activities, including pollution from mining wastes; hunting; and timber extraction (MacKinnon and MacKinnon, 1986; Mayers, 1989; Peal and Kranz, 1990; Stuart and Adams, 1990; Verschuren, 1983). All national forests have logging concessions within them. It has been recognised that if the national forests could be effectively conserved, and if the proposed conservation areas were gazetted, Liberia would have an effective protected areas network (Mayers, 1991).

Other Relevant Information The onset of civil war in early 1990 resulted in the collapse of the national economy, state institutions and infrastructure. Most conservation programmes were halted and there was a general breakdown of the various conservation agencies

(Anstey and Dunn, 1991). The FDA in Monrovia is, however, now starting to be resurrected and the rebel government, which controls 90% of the country, is also setting up a forest management structure (Anstey, pers. comm., 1991).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: An Act for the Conservation of the Forests of the Republic of Liberia

Date: 1953, supplemented 1957

Brief description: Provides for the management of the forest estate and allows for the creation of protected areas.

Administrative authority: Forestry Development Authority (FDA) (General Manager)

Designations:

Reserve Forest

Found within the boundaries of all publicly owned land.

A written permit must first be obtained before any act is done which disturbs the vegetation, wildlife or soil on any public forest reserve or national park. The development of mineral resources in forest reserves is also subject to permit.

Free use permits may be issued to take timber from reserved forests for use in public works or in the construction of public buildings.

Prohibited activities in all protected areas and timber concessions include: the damage or destruction of any government property; the burning of areas for the purposes of establishing a farm or plantation; and leaving felled trees or other obstructions across any trail, road, railroad, or water.

Government forest reserve Rules and regulations for such areas are promulgated by the Secretary of Agriculture and Commerce, and once established, all rights, titles and interest in them are vested in the government.

Prohibited activities, unless authorized by permit include: the collection, conveyance or removal of any forest products of plant origin; damaging trees; setting fire to vegetation; the cutting or removal of timber; prospecting for minerals, coal or oil; damming rivers or other waterways; the construction of buildings, roads, trails or railroads; fishing; or, hunting or setting traps for wildlife.

Native authority forest reserve Found in one or more tribal chiefdoms and are protected as potential government forest reserves in accordance with the rules and regulations prescribed in the act.

Rules and regulations are designed to minimise damage to such areas and to avoid unnecessary depletion of resources pending the establishment of

a government forest reserve embracing the concerned area.

Prohibited activities, unless authorised by permit include: the collection, conveyance, or removal of any forest produce of plant origin; damaging of trees; setting fire to vegetation; prospecting for minerals, coal or oil; damming of rivers or other waterways; or constructing any buildings, roads, trails or railroads.

Communal forest Are administered by the concerned native authority and are limited to small described forest areas immediately adjacent to one or more native villages.

Rules and regulations are set out to insure the perpetuation of these communal forests as a source of forest products for private, local use and to prohibit any commercial use of forest products taken from these areas.

National park Embraces areas which have outstanding scenic, recreational, scientific or other pertinent values which it is deemed wise and expedient in the national interest to set aside.

Once established, all rights, title and interest in such areas are vested in the government.

Prohibited activities, unless authorised by permit include: the collection, conveyance or removal of any forest products of plant origin; damaging trees; setting fire to vegetation; prospecting for minerals, coal or oil; damming rivers or other waterways; or the construction of buildings, roads, trails or railroads.

Hunting, trapping, shooting or molesting of wild animals, or commercial fishing is not allowed.

Wildlife refuge Portions or all of any national forests may be proclaimed wildlife refuges for the purpose of maintaining the wildlife found in Liberia.

No hunting is permitted on these refuges and scientific control of the wildlife populations contained therein is to be undertaken.

Source: Original legislation

Title: An Act Creating Forestry Development Authority

Date: 1 November 1976

Brief description: Creates the Forestry Development Authority and outlines the objectives, responsibilities and powers therein.

Administrative authority: Forestry Development Authority (FDA) (Managing Director)

Designations:

Government forest and National park A forest officer may fell, cut, damage, tap or destroy trees within such areas, and make clearings or remove timber for the purpose of planting trees, improving the growth of trees or for the general better management of reserved forests.

Source: Original legislation

Title : Wildlife and National Parks Act

Date: 21 July 1988

Brief description: An act providing for the conservation of wildlife and the establishment of protected areas.

Administrative authority: Wildlife and National Parks Section, Forestry Development Authority (General Manager)

Designations:

National park Areas which are of sufficient size to allow for the management of the area as an ecological unit taking into account natural movements, feeding habits and habitat requirements of wildlife.

The Forestry Development Authority may submit proposals to the President for the establishment of national parks or nature reserves. If approved, such proposals are delivered to the Legislature, which may then enact legislation for the establishment of such protected areas. It is only by a legislative enactment that a national park or nature reserve may be abolished or have their boundaries changed.

With respect to national parks and nature reserves, prohibited activities include: bringing any weapon, explosive, trap, poison, or other hunting device into such areas; the hunting or capturing of any wild animal; the cutting, clearing, burning or damaging of any vegetation; residing in, occupying or cultivating

any land; constructing any building; mining, quarrying, drilling or removing any mineral or other substances or prospecting for such substances; introducing any domestic animal; obstructing, polluting or diverting any body of water; removing archaeological or cultural materials; and performing any act likely to destroy, endanger or disturb wildlife.

Without written permission from the Authority, no person shall: make any film or video recording for sale or commercial use; light any fire except within the confines of an approved area; and enter any area of such protected areas which have been declared closed to the public. The Act also makes regulations with respect to entry into such areas.

Nature reserve Areas which are of insufficient size to be established as national parks but where they possess natural features which require long-term protection.

Controlled hunting area Areas where hunting is controlled in accordance with regulations issued by the Authority. A valid hunting licence must be obtained.

Game reserve The Authority may provide interim protection to an area, with a view to establishing it as a national park or nature reserve, by declaring it a game reserve.

Such areas are established for the protection, breeding and sustained production of wildlife.

No person shall hunt or capture any animal or enter into, settle, camp, cultivate, cut or burn trees or other vegetation or disturb wildlife in any way in such areas.

Communal forest reserve Such areas are administered by tribal authorities, subject to the rules and regulations of rural administrators and the FDA.

The aim of such areas is for the sustainable harvest of forest products for the benefit of rural communities.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	National Park Sapo	II	130,747	1983

Category VIII forest reserves are neither listed nor mapped.



Protected Area of Liberia

MADAGASCAR

Area 587,040 sq. km

Population 12 million (1989)

Natural increase: 3.2% per annum

Economic Indicators

GDP: US\$ 168 (1987)

GNP: US\$ 180 (1988)

Policy and Legislation Nature protection in Madagascar has a long history. Traditional creeds and superstitions have afforded protection to mountain forests, and many small peaks throughout the island are taboo. They are believed to be the cemetery of the souls of the dead, thus nobody dares set fire to them. However, these creeds and superstitions are now tending to disappear. Protection for the forests was also provided by the "305 Articles Code" of the Ancient Malagasy Kingdom. Under this code, those who were convicted of deforestation were condemned to be chained (Andriamampianina, 1982).

The idea of classifying natural areas germinated in the wake of the National Committee for the Protection of Colonial Fauna, instituted in Paris in 1923. In 1925, this Committee concluded that it was necessary to create national parks throughout the French colonies, following the American initiative. After two years of debate, during which the idea of prohibiting access in the land to be protected was retained, the decision was taken to create nature reserves (*réserve naturelle*) rather than national parks. The first nature reserves were established by a decree of 31 December 1927. Following the country's accession to the London Convention, the title of nature reserve was altered to strict nature reserve (*réserve naturelle intégrale*). Two further decrees of 11 June 1939 and 3 January 1952 created the 11th and 12th strict nature reserves, respectively. One area, Masoala, was subsequently degazetted in 1964. Decree No. 66-242 of 1 June 1966 (see Annex), abrogating these three decrees, is the piece of legislation currently in force (Andriamampianina, 1987; IUCN/UNEP/WWF, 1987).

National parks legislation is contained in Decrees Nos 58-07 of 28 October 1958 and 62-371 of 19 July 1962 (see Annex). Access to parks is controlled. Rights are accorded to neighbouring villagers for the exploitation of certain forest products; these rights are tied to duties incumbent on the beneficiaries (Andriamampianina, 1987; IUCN/UNEP/WWF, 1987). Parks and reserves, although established under individual decrees, are governed by general hunting, fishing and protection regulations (Ordonnance No. 60-126 of 3 October 1960).

The special reserves, established from 1962 to 1985, are regulated by a series of decrees and have less strict regulations. They are established for the conservation of specific plant and animal species or habitats. Special

reserves were mentioned in the London Convention, but no definition for them was given. Following this convention, the term special reserve was used for three sorts of protected zone: faunal reserve, for the conservation of wildlife; partial reserve or sanctuary, for the protection of characteristic threatened animal or plant communities; soil, water and forest reserves for the protection of these particular resources. Access is not restricted and although use of the land and its products is generally prohibited, these are areas where local communities can use secondary forest products (IUCN/UNEP/WWF, 1987).

An Order (*Arrêté*) of October 1952 concerning special reserves, stated that due to the complexity of the Malagasy flora and the great diversity from one region to another of the island, classification of zones needing protection as strict nature reserves was insufficient, and that less severe measures than those provided for under the London Convention would suffice. These "less severe measures" were determined in a further order of December 1955. They concern the possibility of prohibiting or regulating movement within special reserves. Following the publication of these two orders, the legal institution of special reserves was made by specific decrees. None of these specific decrees, however, prohibits or regulates circulation within these territories (Andriamampianina, 1987).

Hunting reserves are established by classification order, which involves the suspension of hunting rights on a roughly defined area (Nicoll and Langrand, 1989).

The African Convention, was ratified in Madagascar by Law No. 70-004, and currently forms the basis for wildlife legislation.

Forest legislation dates back to the promulgation of the Forest Decree of 25 January 1930 (see Annex). This provides, amongst other things, for the designation of land, both state and privately-owned within the forest domain. Designations include: protection forest; reforestation area; production forest; reserved forest and privately-owned forest. There are about 158 classified forests, covering an area of about 2,671,000ha, established by individual ministerial declarations. These areas are closed to forest exploitation, but protection is not permanent. Some use may be made of secondary forest products by local communities. Classified forests are created under an initiative of the Minister in charge of the Department of Water and Forests, on the advice of a Commission composed of representatives of the administration and local inhabitants.

WWF representation was officially established in Madagascar by Presidential Decree No. 79-145 (14 June 1979) (WWF, 1991). Legislation concerning the protected areas system of Madagascar is reviewed by Andriamampianina (1987), IUCN/UNEP/WWF (1987),

Nicoll and Langrand (1989) and Schmithüsen (1986). Andriamampianina (1987) concludes that the legislation concerning parks and reserves is sufficiently adapted to international conventions that no modifications are necessary.

International Activities On 25 January 1937 the 1933 Convention Relative to the Preservation of Fauna and Flora in their Natural State (which was signed in London and became known as the "London Convention") was accepted in Malagasy law. The main emphasis of the London Convention was the establishment of protected areas. It required parties to explore the possibility of establishing national parks and strict nature reserves, in which the hunting, killing or capture of fauna and collection or destruction of flora in parks and reserves was prohibited. It further required parties to establish intermediate zones around the borders of parks and reserves in which the killing or capture of animals was to be controlled by the park or reserve authorities and in which no person "should have any claim in respect of depredations caused by animals". The intention of this latter provision was to create buffer zones around the parks which farmers could cultivate at their own risk and where animals migrating out of the park would not immediately be shot (Lyster, 1985). Madagascar has ratified the 1968 African Convention of Nature and Natural Resources which replaced the London Convention and provides for the establishment of strict nature reserves, national parks and nature reserves. The African Convention emphasises the need for conservation areas, which are defined as any protected natural resource area, whether it be a strict natural reserve, a national park or a special reserve. This last category of special reserve includes partial reserves, sanctuaries, soil, water and forest reserves. A further clause states that contracting states shall take all necessary legislative measures to reconcile customary rights with the provisions of this Convention.

The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was ratified on 19 July 1987, although to date no sites have been inscribed. One site has been accepted as a biosphere reserve under the Unesco Man and the Biosphere (MAB) programme. The country is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).

Administration and Management This is the responsibility of the Forest Administration (Administration Forestière) within the Department of Water and Forests (Direction des Eaux et Forêts) which comes under the Ministry of Animal Production (Breeding and Fishing) and Water and Forests (Ministère de la Production Animale (Élevage et Pêche) et des Eaux et Forêts). The Department of Water and Forests is also responsible for forests and freshwater fisheries, while other departments within the same Ministry deal with marine fisheries and agriculture.

Each strict nature reserve has a station for a deputy forester and each station is divided into two or three sectors under the responsibility of auxiliaries. Special reserves do not have supervisory personnel. Permits for entry to parks and reserves are obtained from the Department of Water and Forests in Antananarivo. In practice, adequate numbers of staff have not been available to ensure effective protection. Andriamampianina (1982) reported that strict nature reserves and national parks had only one agent each, mostly isolated with no vehicle, and that only two special reserves had one agent each. At that time no funds were allocated to protected areas maintenance. Jolly (1990) confirms this, stating that many of the protected areas are protected only in name, most being unprotected from land and animal poachers.

The Forest Service generally lacks equipment and urgently requires vehicles, field equipment and uniforms for its staff, as well as large increases in its field staff (currently each "agent" covers some 25,000ha). Protection of classified forests and reforestation areas is particularly uncertain because of the lack of resources. More training centres are needed for personnel working within protected areas. Currently, the budget is not sufficient to manage the protected areas system adequately, so participation of the WWF within specific areas is recommended (Nicoll and Langrand, 1989).

WWF and IUCN are giving support to improving the management of parks and reserves. Madagascar was the first French-speaking African country to become a member of IUCN, shortly after the country achieved independence in 1961 (Andriamampianina, 1982). In October 1970, a conference on conservation of nature and resources, organised by the government and greatly helped by IUCN, was held in Antananarivo, at which plans were made to conserve the particularly interesting flora and fauna of the island (IUCN, 1972). The conference was an important step towards the protection of Malagasy parks and reserves. It helped make people aware of the exceptional part played in the world by Madagascar's protected areas due to the value of the country's natural resources, and promoted understanding of the degradation threat which grows with development (Andriamampianina, 1982). A follow-up conference entitled "Conférence de Madagascar sur la conservation des ressources naturelles au service du développement" was held in Antananarivo in November 1985. Its principal aim was to develop projects for international funding within the framework of a national conservation strategy. Considerable emphasis was placed on protected areas, in particular the necessity for full biological inventories of existing protected areas and investigation of ways of increasing their value to local people. For many years, Madagascar has been a priority for WWF (The World Wide Fund for Nature), which therefore has played and continues to play a large rôle in the country. In June 1979, a decree was issued authorising the establishment of a WWF representation in Madagascar to promote conservation.

Up to 1986, the representation was mainly concerned with education and public opinion, and to a lesser extent with implementation of field activities. Activities included organisation of lectures, debates, educational visits to study ecosystems, radio and television broadcasts and the preparation and distribution of brochures and posters. Its activities have helped establish the Association for the Protection of the Environment at Ansteranana (Diego Suarez), the Association for the Protection of Nature at Toamasina (Tamatave) and the Association for the Understanding and Conservation of Nature in Madagascar. Since mid-1986 an additional officer has been appointed with responsibility for the implementation of field activities, particularly with respect to improving management of protected areas. Currently there are 29 separate WWF projects in the country (WWF, 1991).

All conservation projects are undertaken by various governmental services, such as the Department of Water and Forests or the university, in close collaboration with WWF. Research by foreigners is encouraged, under the aegis of the Direction de la Formation Post-Universitaire in the Ministère de l'Enseignement Supérieur.

Madagascar has recently become popular amongst international aid-donors, who have realised that the country is one of the world's priorities for conservation. The World Bank, in a significant departure from its normal strictly developmental role, has targeted Madagascar in a pilot cooperative venture to integrate conservation and economic growth (Jolly, 1990). The Bank has sought the advice of 150 Malagasy civil servants in tailoring an "Environmental Action Plan" to Madagascar's specific needs. To avoid antagonising locals by simply protecting land and wildlife, all Bank and government efforts emphasise economic support and development for rival regions as well as preservation. Funds are divided equally: half to the reserve, and half to the local people.

Systems Reviews Madagascar, separated from the African continent by the Mozambique Channel which at its narrowest point is around 300km, is the fourth largest island in the world. Relief is complex and variable, although the land nowhere rises higher than 3,000m. Four main geological features predominate: a Precambrian basement covering the eastern two thirds of the island (with the exception of some small coastal areas, sedimentary in origin); a sedimentary region along the west coast, dating from Permian to recent; widespread volcanic intrusions and finally an extensive lateritic mantle, principally overlying the Precambrian basement (IUCN/UNEP/WWF, 1987; Rakotovoao *et al.*, 1988). The main axis of the island extends in a north-north-east to south-south-west direction, with the main lines of relief along this. The eastern coastline, almost straight for a large part of its length, gives way to a narrow, but continuous coastal plain. From this, an escarpment rises to a plateau of between 800m and 1,500m altitude which slopes down to the north and south, and has many massifs of up to 2,500m rising out

of it. The westward slope is much gentler, although interrupted by cliffs, with the western regions consisting of plains and plateaux with extensive delta areas. Watercourses are comparatively short in the steep profiles. There are no extensive water bodies (IUCN/UNEP/WWF, 1987).

Madagascar is one of the seven major world centres of biodiversity, and has been called the number one conservation priority in the world. The diversity of its climates, soils and geographical features provides a variety of ecosystems from deserts to high-montane rain forest. Its early separation from other large land masses (c. 140 million years ago) allowed an evolution of fauna and flora unlike that found anywhere else in the world (O'Connor, 1990). Madagascar is famous for its extremely high levels of endemism of both fauna and flora. In general, all types of vegetation are rich in species; dominance by individual species or groups of species does not occur. The original vegetation of the eastern region of the island was almost entirely forest. Evergreen rain forest occurred everywhere below 800m, and three other forest types above 800m: moist montane forest and sclerophyllous montane forest occurred on the eastern slopes of the highlands, while "tapia" forest grew on the western slopes. Above 2,000m forest is replaced by montane thicket. Rocky outcrops above and below 2,000m support rubicolous communities. Although the western region is less rich floristically, the flora is still large and varied. There are two main types of primary vegetation: dry deciduous forest and deciduous thicket (IUCN/UNEP/WWF, 1987; Rakotovoao *et al.*, 1988). The vegetation has been seriously degraded: at least 80% (and probably 85%) of the land surface of the island no longer has significant native woody plant cover. Secondary formations which have replaced the primary vegetation types comprise some lowland rain forest and secondary grassland, which covers enormous areas of the eastern region, and more than 80% of the western region. Madagascar has significant areas of both coral reefs and mangroves. Extensive areas of mangrove occur on the west coast, such that the island possesses the largest areas of mangrove in the western Indian Ocean. A few scattered patches also occur on the east coast (CML, 1987; IUCN/UNEP/WWF, 1987). Reefs are extensive and numerous and include good examples of almost all of the main classic reef types. They occur mostly on the west coast, covering a distance of more than 1,000km, in the north-west and south-west, separated by a central region with relatively sparse reef growth.

The principal agent of forest destruction is "tavy" (slash-and-burn) cultivation, carried out by subsistence farmers. The ground is later cultivated, mainly with dry land rice, but also with maize, cassava and other crops. Tavy cultivation is often practised on very steep slopes (often over 20%) where the risk of erosion is high. Coffee is the principal cash crop, followed by cloves and vanilla. A small percentage of mangroves is exploited for fuel wood and house and fence construction, but most are still

untouched or little degraded, largely due to the low population pressure on the west coast. In 1987, the extent of felling was not considered to constitute a threat to the stability of the ecosystem, but future prospects towards the end of the century are considered more precarious due to the rapid population growth. The impact of current human activities on the reefs is virtually unknown. A threat of possible importance to reefs is sediment accumulation, as a result of the massive erosion and concomitant soil runoff which affects much of the island (CML, 1987; IUCN/UNEP/WWF 1987; Rakotovo *et al.*, 1988).

The first 10 nature reserves were established in 1927. They were selected in order to provide as representative as possible a sample of the many ecological features of the island. They were also situated, if possible, in sparsely populated or mountain areas, away from pressure of use for agriculture. Two further nature reserves were established in 1939 and 1952. The first national park was finally created in 1958, the second in 1962. Four further national parks were created between 1989 and 1991. Twenty one special reserves were established from 1956 to 1982 for the conservation of specific plant and animal species or habitats (IUCN/UNEP/WWF, 1987).

Currently, less than 2% of the country is included within the protected areas system (excluding forest reserves), and Malagasy biodiversity is not fully represented. Major problems are: not all native terrestrial forest communities are included, nor are particular threatened species; the geographical distribution of existing protected areas leaves substantial gaps in the south-west and centre-east; no mangroves are currently included in the system; inland wetland protection is inadequate; no coral reefs and only two offshore islands are protected, leaving most marine ecosystems unprotected; a range of severely threatened species does not occur in existing protected areas (Nicoll and Langrand, 1989).

The protected areas system is reviewed in Mittermeier (1986). This includes sections on both country-wide and regional conservation priorities. The second section comprises reports on existing and proposed conservation programmes within existing and proposed protected areas. Programmes within privately-owned protected areas are also included. The protected areas system forms one section in IUCN/UNEP/WWF (1987), comprising data sheets for individual protected areas. Nicoll and Langrand (1989) comprises a review of ecosystems, protected areas, and species conservation requirements based on nationwide joint surveys carried out by WWF and the Ministère de la Production Animale (Élevage et Pêche) et des Eaux et Forêts. Twenty eight protected areas were surveyed, as well as 18 other sites, including two private reserves. Based on these surveys and a general review of ecosystems and species, 14 additional sites are recommended for inclusion within an expanded protected areas system. These new sites would protect additional native terrestrial forest communities providing more complete geographical coverage and

safeguarding currently unprotected communities. These would also protect coral reefs, offshore islands, mangroves, and inland wetlands. The minimum administrative requirements for management of the proposed protected areas system are outlined. They propose that access to protected areas by Malagasy people should be promoted for educational purposes and to heighten public awareness, within selected areas. Tourism should be encouraged to help demonstrate to locals that protected areas can constitute a source of revenue.

In a review of mangroves, proposals are made for the identification of sites to be given priority for conservation of mangroves, and for research and training in the management of mangroves to be established (CML, 1987). Proposals to improve the protected areas system are given in MacKinnon and MacKinnon (1986, 1987) and IUCN (1987).

Protected areas are threatened by a spectrum of pressures that occurs on a national, regional or local scale. All protected areas are reportedly threatened by fire, poaching and shifting agriculture, and traditional conservation measures are becoming weaker. Settlers have burned some 80% of the island's forests for subsistence farming, and bush fires are a particular menace in the western and southern phytogeographic domains. Charcoal burning is a major threat in the hinterlands of larger towns. Collection of ornamental plants, which occurs throughout Madagascar, presents local threats to specific taxa. Soil erosion is endemic and, while the remaining forest watersheds have plenty of water, the spiny desert and other barren areas are water-poor (Jolly, 1990; Nicoll and Langrand, 1989; WWF, 1991).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Decree No. 66-242

Source: Andriamampianina (1987)

Date: 1 June 1966

Brief description: Provides *inter alia* for the designation of strict nature reserves

Administrative authority:

Designations:

Réserve naturelle intégrale (Strict nature reserve)
Access is forbidden, other than for scientific purposes.

Source: IUCN/UNEP/WWF, 1987

Title: Decree No. 58-07

Date: 28 October 1958

Brief description: Provides for the creation of Montagne d'Ambre National Park

Administrative authority:

Designations:

Parc national (National park) No definition given, but adherence to the London convention is noted, and circulation on foot or by vehicle as well as camping are regulated by administrative decisions.

Title: Decree No. 62-371

Date: 19 July 1962

Brief description: Provides for the creation of Isalo National Park

Administrative authority:

Designations:

Parc national (National park) No definition given, but adherence to the London convention is noted, and circulation on foot or by vehicle as well as camping are regulated by administrative decisions.

Collection of fruit from landibe *Boroceras madagascariensis* and tapia *Uapaca bojeri* is specifically permitted within the appropriate sector opened each year for collection.

Source: Andriamampianina, 1987

Title: Décret Forestier du 25 janvier 1930
(modifié par le décret du 25 septembre 1937)

Date: 25 January 1930

Brief description: Provides *inter alia* for designation of land within the forest domain

Administrative authority:

Designations:

Forêt de protection (Protection forest) Forests on lateritic soil on a slope of 35° or more.

Includes state, community and privately owned land.

Exploitation of community or privately owned forests is subject to previously obtained registration from the head of the forest service, to a maximum of 50% of existing trees.

Exploitation of state forests is only given in exceptional circumstances.

Réserve de reboisement (Reforestation area)
Areas obligatorily classified in this section include: slopes of 35° and over which the forest service considers to be indispensable; coastal dunes; land liable to dangerous gullying and isolated massifs smaller than 500ha.

All exploitation and customary rights of use are prohibited.

After afforestation these areas (other than those of 35° or more) may be classified by decree of the Governor General, as a forest reserve.

Forêt de production (Production forest)

Forêt réservée (Reserved forest) Forested areas set aside by order of the Governor General, to be managed for future controlled exploitation.

Exploitation of areas greater than 100ha is subject to a permit first being obtained.

Forêt des particuliers (Privately-owned forest)
Clearing only permitted with official authorisation.

Permission may only be refused if clearing will compromise erosion, public health or military defence.

Official permission is not necessary for land planted with species less than 30 years old.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>National Parks</i>				
1	Isalo	II	81,540	1962
2	Mananara Marine	II	1,000	1989
3	Mananara Terrestrial	II	23,000	1990
4	Mantadia	II	10,000	1989
5	Montagne d'Ambre	II	18,200	1958
6	Ranomafana	II	37,567	1991
<i>Strict Nature Reserves</i>				
7	Andohahela	I	76,020	1939
8	Andringitra	I	31,160	1927
9	Ankarafantsika	I	60,520	1927
10	Betampona	I	2,228	1927
11	Marojejy	I	60,150	1952
12	Tsaratana	I	48,622	1927
13	Tsimanampetsotsa	I	43,200	1927
14	Tsingy de Bemaraha	I	152,000	1927
15	Tsingy de Namoroka	I	21,742	1927
16	Zahamena	I	73,160	1927
<i>Special Reserves</i>				
17	Ambatovaky	IV	60,050	1958
18	Ambohijanahary	IV	24,750	1958
19	Ambohitantely	IV	5,600	1982
20	Analamerana	IV	34,700	1956
21	Andranomena	IV	6,420	1958
22	Anjanaharibe-Sud	IV	32,100	1958

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
23	Ankarana	IV	18,220	1956
24	Bemarivo	IV	11,570	1956
25	Bora	IV	4,780	1956
26	Cap Sainte Marie	IV	1,750	1962
27	Foret d'Ambre	IV	4,810	1958
28	Kalambatritra	IV	28,250	1959
29	Kasijy	IV	18,800	1956
30	Mangerivola	IV	11,900	1958
31	Maningozo	IV	7,900	1956
32	Manombo	IV	5,020	1962
33	Manongarivo	IV	35,250	1956
34	Marotandrano	IV	42,200	1956
35	Nosy Mangabe	IV	520	1965
36	Pic d'Ivohibe	IV	3,450	1964
37	Tampoketsa d'Analamaitso	IV	17,150	1958
	<i>Hunting Reserve</i>			
38	Lac Kinkony	VI	15,000	1972
	<i>Other area</i>			
44	Lac Itasy	VI	3,500	
	<i>Biosphere Reserve</i>			
	Parc national de la Boucle du Baoulé	IX	771,000	1982
	<i>World Heritage Site</i>			
	Bemaraha Integral Nature Reserve	X	152,000	1990

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Madagascar

MALAWI

Area 118,480 sq. km

Population 8,754,000 (1990) (includes 1 million refugees from Mozambique)

Natural increase: 3.63% per annum

Economic Indicators

GDP: US\$ 162 per capita (1987)

GNP: US\$ 160 per capita (1988)

Policy and Legislation Early legislation allowing for the creation of national parks, controlled areas and game reserves was Ordinance No. 26, 1953 of the Nyasaland Protectorate. Today, national parks and game reserves are authorised and managed in compliance with three government Acts. The Land Act No. 25, 1965 and subsidiary legislation of 1965, 1967 and 1968 authorises acquisition of customary land and its declaration as public land which can then be gazetted as a national park. The National Parks Act No. 33, 1969 provides for habitat protection measures and strict controls over wildlife use in such areas. Prohibitions and penalties are outlined, and the National Parks Regulations No. 38, 1973, made pursuant to this Act, stipulates additional protective measures for wildlife (Annex). The regulations also contain provisions with respect to permits, fees, offences and accompanying penalties, and the responsibilities and powers of the Chief Parks and Wildlife Officer (CPWO). National parks can only be reduced in size or dereserved by a resolution passed by the National Assembly.

The Game Act (Cap. 66:03) No. 26, 1953, as amended, is the principal act for the protection, control, hunting of and trade in game animals, and authorises the designation of controlled areas and game reserves where special hunting restrictions apply (see Annex). The Act provides for various kinds of hunting licences, specifies penalties for different offences under the act, and provides for enforcement measures and powers. The Minister may make rules on a number of matters and the Act contains three schedules regarding which animals may be hunted. The Game Rules (Cap. 66:03)(G.N.71), 1954, enacted pursuant to the Game Act, contain detailed provisions on hunting, licences and trophies, and prescribe unlawful activities in game reserves.

In practice, the preservation of ecological communities and catchment conservation are the basic concerns in the establishment and management of parks and reserves, and scientific research is considered a priority use for all areas (Bell, 1981; Kombe, 1982; MacKinnon and MacKinnon, 1986). Game and timber exploitation is possible in all game reserves providing that: the resource is able to support harvesting; permissible harvest levels have been established and quotas set at no more than sustainable yield levels; and the Parks Department is able to monitor and regulate any offtake (MacKinnon and MacKinnon, 1986). All national parks and game

reserves are under government control and there are no private land users within them (Croft, n.d.).

The Hippopotami (Protection) Rules, 1956 made under the Game Act, are designed to protect this species in specified areas (IUCN, 1986). The Wild Birds Protection Act (Cap. 66:04) No. 7, 1959 which entered into force in 1961 together with subsidiary legislation, provides general protection for wild birds, and authorises the Minister to declare controlled areas and bird sanctuaries within which specified wild birds are protected (see Annex). Enforcement measures and penalties are also specified. Order No. 225, 1964 made under this Act has declared all of Malawi to be a controlled area for purposes of protecting wild birds (IUCN, 1986). The Protected Places and Areas Order was declared in 1964 and amended in 1966 and 1968.

Complementing wildlife legislation is the Official Wildlife Policy Statement, issued by the government of Malawi in 1963. Provisions of this policy include: the protection of wildlife in all existing game reserves and forest reserves by enforcing restrictions on hunting and in preventing the disturbance of the natural habitat; control of hunting in other areas through restriction by licence; and encouraging conservation education and programmes (Hayes, 1983).

State forests were created from African trust land with the concurrence of the respective native authorities. Initially, these forests were proclaimed as public land under the Acquisition of Land for Public Purposes Ordinance No. 19, 1948 and subsequently as forest reserves under the Forest Act (Cap 63:01) No. 2, 1942, amended to 1967 (see Annex). This Act also makes provision for the creation of customary land administration areas and village forest areas; specifies the powers of the Minister, Chief Conservator and forest officers in the administration of such areas; and outlines offences and accompanying penalties in connection with the Act. Subsidiary legislation to the Act, in the form of Forest Rules No. 33, 1958, as amended, specifies activities permitted in forest reserves in the various districts of the country. Local authority forests, run by district councils, were created from African trust land, the land being leased to them on a long term. Private forests may be freehold or on leased land (FAO, 1981).

The Monuments Act No. 44, 1965 makes provision for the preservation and protection of places of distinctive natural beauty (sites, buildings, and objects of archaeological and historical interest) and for the establishment of an Advisory Committee (Varady, 1982).

A weakness of forestry legislation is that nearly all of the country's statutes were enacted prior to independence and occasionally revised in the late 1960s (Varady, 1982). Currently, natural resource management is

governed by six separate acts of parliament, but these are being rationalised into a single new Act.

International Activities At the international level, Malawi is party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) which it ratified on 5 January 1982. To date, one site has been inscribed on the World Heritage List. Malawi is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not have any sites listed under the Unesco Man and the Biosphere (MAB) Programme. At the regional level, Malawi has ratified the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area (see Annex). In addition, Malawi is responsible for coordinating regional programmes and projects in the forestry, fisheries, and wildlife sectors throughout the ten-nation SADCC (Southern African Development Coordination Conference) region.

Administration and Management In 1946, a Game and Forest Reserves Commission was set up to report on the value and suitability of all game and forest reserves in the former Nyasaland Protectorate (Hayes, 1983). Based on the recommendations of this Commission, the Department of Game, Fish and Tsetse Control came into being in 1949. In 1962, this Department was wound up and responsibility for wildlife conservation, national parks and game reserves taken over by the Game Division of the Department of Forestry and Game. This situation lasted until 1973, when, as directed by the President, a separate Department of National Parks and Wildlife was established within the Ministry of Agriculture and Natural Resources (Anon., 1977). Today, the Ministry of Forestry and Natural Resources is responsible for environmental matters. Under this Ministry are found the Department of Forestry, Fisheries Department, and Department of National Parks, Wildlife and Tourism (DNPWT).

Objectives of the DNPWT are, *inter alia*: to maintain selected biological communities; to preserve selected landscapes and features of particular aesthetic beauty, cultural significance or scientific interest; to preserve catchments and water resources; to prevent species extinction; and to support public use of the wildlife resource as specified in the master plan (Clarke, 1983a). Specific activities of the DNPWT include: law enforcement; public education; zoning of protected areas and their surroundings to provide good habitat management while meeting the needs of local human populations; and animal population management (Stuart and Adams, 1990). Under the Chief Parks and Wildlife Officer (CPWO) is a Principal Parks and Wildlife Officer (PWO) who oversees the activities of three senior officers who are in charge of the regional offices. A number of parks and wildlife officers are in charge of the individual parks and reserves and are supported by assistants, scouts and technical staff (Clarke, 1983a). Management and control of forest reserves and the

forestry estate, is the responsibility of the Department of Forestry. The predominant non-governmental organisation in the country is the Wildlife Society of Malawi, formed in 1947 as the Nyasaland Fauna Preservation Society (Hayes, 1983). Its objectives are: to foster the preservation of wildlife in Malawi; to stimulate public interest on questions of wildlife conservation; to encourage and promote national parks and game reserves; and to cooperate with similar bodies in other countries (NFPS, 1982).

Constraints facing the management of protected areas include: a lack of qualified staff and funds, and difficult access to a number of sites (Croft, n.d.; Hughes and Hughes, 1991). Further investments in manpower, development and conservation operations are needed to improve the effectiveness of the Department of National Parks, Wildlife and Tourism (MacKinnon and MacKinnon, 1986). Management of forest reserves is further hindered by inadequate enforcement of forestry legislation (Clarke and Bell, 1986).

Systems Reviews Malawi, situated at the southern end of the Western Rift Valley, is bordered by Zambia to the west, Tanzania to the north and north-east, and Mozambique to the east, south and south-east. High mountains and deep lakes are typical of the country, with Lake Malawi stretching for 557km along the eastern border from north to south (Hughes and Hughes, 1991). In the central region, west of Lake Malawi, plateaux reach elevations of 760-1,579m and cover about three-quarters of the total land surface. Mountain ranges occur in the north-west, west and south-west and attain elevations in the range of 2,400m. The Shire Valley in southern Malawi is only 70m above sea level at the Mozambique border, but is adjacent to the mountain massifs of Mulanje and Zomba (Hughes and Hughes, 1991).

The biogeographic affinities are predominantly Zambebian, with Afromontane elements in the mountains. The vegetation is mainly miombo woodland, with drier Zambebian woodland in the south, montane forest and grassland at higher elevations, and patches of lowland forest on the northern shores of Lake Malawi and on the lower slopes of Mount Mulanje (Stuart and Adams, 1990). Land use in the country is such that 36% is permanent agriculture/pasture, 39% is forest/woodland, while 1.6% is closed forest cover in small forest patches (Mackinnon and Mackinnon, 1986; Stuart and Adams, 1990). Almost 35% of the country's population is engaged in agricultural activities, with tobacco, sugar and tea making up about three-quarters of the exports.

The major drainage system covering 158,000 sq. km, culminates in Lake Malawi (2,450,400ha; 1,750,400ha in Malawi) (Hughes and Hughes, 1991). Three other lakes in Malawi are the Chilwa, Malombe and Chiuta (Varady, 1982). The Lower Shire River which drains Lake Malawi expands into extensive marshes and swamps before joining the Zambezi River in Mozambique. Other swamps and marshes are found in

the Western Highlands near the Zambian border. A number of wetland areas are afforded a degree of protection in the reserve network; exceptions being the elephant marsh, salt lakes (Lake Chilwa), a number of freshwater lakes, the Shire Marshes, wetlands associated with Lake Malawi, and, notably, little of the actual waterbody of Lake Malawi itself (MacKinnon and Mackinnon, 1986; Hughes and Hughes, 1991). The aims of the SADCC Wetlands Project, supported by IUCN and NORAD, include: the development of a regional wetlands strategy based on a review of the status of wetland resources; identification of priority conservation actions; and development of integrated land-use in wetlands management (Stuart and Adams, 1990).

Following his first visit to Malawi in 1859, Livingstone made numerous references to the abundance of wildlife he saw in the country. Subsequently, when Nyasaland was declared a British Protectorate in 1891, the Consul General, H.H. Johnston, realised that unless steps were taken to protect this resource, it would soon disappear (Hayes, 1983). This led to the enactment of the Game Regulations in 1897, which specified the establishment of two game reserves, Elephant Marsh and Lake Chilwa, among other provisions. These regulations were followed by a number of Ordinances in 1902, 1911, and 1927, which made only limited provision for the creation and management of conservation areas. By 1946, however, no fewer than eight new game reserves had been established in the country (Hayes, 1983). During the 1950s, a number of game reserves were abolished, while others were established under the Game Ordinance of 1953 (Hayes, 1983). The first national park was created in 1965 (Nyika), with several others to follow in the 1970s and 1980s. Today, five national parks and four game reserves cover about 8.9% of the country's total area and include representative samples of all major vegetation types (MacKinnon and MacKinnon, 1986). Further, of the 29 biotic communities recognised by Shaxson (1977), examples of 18 occur in the park and reserve system (Clarke and Bell, 1986). A number of others are found in the forest reserve network.

Shortly after being declared a British Protectorate, the first forest reserves were created, one of the first being Mt Mulanje in 1894 (IUCN, n.d.). A number of these were subsequently regraded to the status of game reserve or national park in the ensuing years. Currently, there are 59 forest reserves (716,141 ha) serving a protection function and 44 commercial (plantations) forests (98,924 ha) in the country (Mjojo, pers. comm., 1991). Together, these forest reserves cover 6.9% of total area. An additional 88 forest reserves have been proposed, and all of the commercial forests have conservation working circles within them which are either selectively felled or not logged at all (Mjojo, pers. comm., 1991).

Malawi's parks and game reserves have developed under two major constraints: land already settled tended to be unavailable for designation as protected areas; and areas that lacked interesting phenomena (i.e. large mammals) tended to be overlooked (Clarke and Bell, 1986).

Nevertheless, Malawi has one of the best run protected area systems in the Afrotropical Realm, guided by a master plan for national parks and wildlife, and protected area plans for protected areas in the northern, central and southern regions, prepared in the early 1980s (Clarke, 1983a, b, c, d; Mackinnon and MacKinnon, 1986; Stuart and Adams, 1990).

Certain priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams, (1990). Recommendations include: upgrading the status of, extending and affording a higher degree of protection to Mt Mulanje Forest Reserve and a number of other forest reserves in the montane system; extending protected area coverage in the deciduous miombo woodlands and the evergreen forest biome; and extending the boundaries of Lake Malawi National Park to include more of the lake's waters within the protected area (Clarke and Bell, 1986; IUCN, 1987; MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990). Integrated rural development programmes, that include provision for local communities to benefit from wildlife have been in operation in several parts of the country for some time, and it has been suggested that these programmes be extended to the Lower Shire Valley (Stuart and Adams, 1990; Huxley, pers. comm., 1991).

The Department of Forestry's "Statement of Development Policies (1987-1996)" is currently guiding the management and control of the forest estate. The accompanying five-year action plan (1988-1992) has identified a number of priority strategies which include: improved management of woodlands and hillslopes; initiatives in community forestry; encouragement of multiple land use systems; cooperation with other countries in the SADCC region in the development of forest resources; and strengthening of the Department of Forestry. A number of projects are ongoing in support of these strategies (Department of Forestry, 1990).

Threats to the protected areas network include annual burning carried out by local populations, illegal hunting and fishing, rice cultivation, encroachment from an expanding human population, agricultural and timber-producing incursions, removal of saplings for house poles and other purposes, invasion by introduced plant species, and in the wetland system, the build up of insecticides and pesticides, pollution, and fish introductions into Lake Malawi (Anon., 1991; Chapman, 1983; Hughes and Hughes, 1991; MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: National Parks Act (No. 33)

Date: 1969

Brief description: Provides for species conservation and the creation and establishment of national parks.

Administrative authority: Department of National Parks, Wildlife and Tourism (Chief Parks and Wildlife Officer)

Designations:

National park The Minister may declare such areas for the purpose of the propagation, protection, conservation and study therein of animals in their natural habitat, vegetation and objects or places of geological, ethnological, archaeological, historical, scientific or educational interest, for the benefit and enjoyment of the inhabitants of Malawi and of visitors thereto.

Source: Original legislation

Title: National Parks Regulations (No. 38)**Date:** 1 August 1973**Brief description:** Govern the management and use of national parks**Administrative authority:** Department of National Parks, Wildlife and Tourism (Chief Parks and Wildlife Officer)**Designations:**

National park Except with the permission of the Chief Game Warden or Warden, prohibited activities include: cutting or setting fire to any vegetation or otherwise damage any object of geological, prehistoric, archaeological, historical or scientific interest in a park; introducing any animal or vegetation; removing any animal or vegetation, or any object of geological, prehistoric, archaeological, historical or scientific interest; destroying or defacing any object; molesting or disturbing any animal; displaying any notice or advertisement within or around a park; discarding refuse or litter; and making any noise or do any act which is likely to disturb or annoy another person.

Regulations are also in force with respect to camping, entrance restrictions, hours of operation, speed limits, and the landing of aircraft.

The exploitation of timber in national parks and game reserves is not allowed.

Sources: Original legislation; FAO, 1981**Title: The Game Act (Cap. 66:03) No. 26****Date:** 1953**Brief description:** Provides for the protection, control, hunting of and trade in game animals, and for the designation of controlled areas and game reserves.**Administrative authority:** Department of National Parks, Wildlife and Tourism (Chief Parks and Wildlife Officer)**Designations:**

Game reserve Hunting in such areas is generally prohibited unless the Director considers that any animal in a game reserve should be hunted in the interests of improved wildlife management.

Sale of game meat in any district which contains any part of a game reserve or national park or in any other area designated by the Minister requires a valid licence authorising the activity.

Controlled area Within such areas, no person shall sell any game meat unless he/she is resident of the

area or in possession of a valid licence authorising the sale.

Source: IUCN, 1986**Title: The Wild Birds Protection Act (Cap. 66:04; No. 7)****Date:** 1959, entered into force 1961, amended 1964**Brief description:** Provides protection for birds and authorises establishing controlled protected areas and bird sanctuaries.**Administrative authority:** Department of National Parks, Wildlife and Tourism (Chief Parks and Wildlife Officer)**Designations:**

Controlled area and Bird sanctuary In such areas, a person may not shoot, disturb, or take specified protected birds or eggs without a valid licence issued at the discretion of the licensing officer. The Minister oversees these provisions.

Source: IUCN, 1986**Title: The Forest Act (No. 2)****Date:** 1942, amended to 1967**Brief description:** Allows for the creation of forest reserves, village forest areas, customary land administration areas, and makes provision for the management of the forest estate.**Administrative authority:** Department of Forestry (Chief Forestry Officer)**Designations:**

Forest reserve Means any demarcated forest or proclaimed forest reserve, but does not include a village forest area.

The Minister may, after consultation with the Minister responsible for land matters, by order published in the *Gazette*, declare any public or customary land to be a forest reserve. The Minister may, by proclamation, declare that the whole or part thereof of a forest reserve shall cease to be such.

The Minister and Chief Conservator are empowered to make rules governing the management and use of such areas.

Village forest area Any village Headman may, with the approval of the Minister, demarcate in customary land a village forest area.

Village forest areas are governed by such rules concerning the protection, control, and management of forest produce as the Minister may prescribe.

Customary land administration area The Minister may, by order published in the *Gazette*, declare that the protection, control and management of forest produce in a particular area of public or customary land shall be the responsibility of the

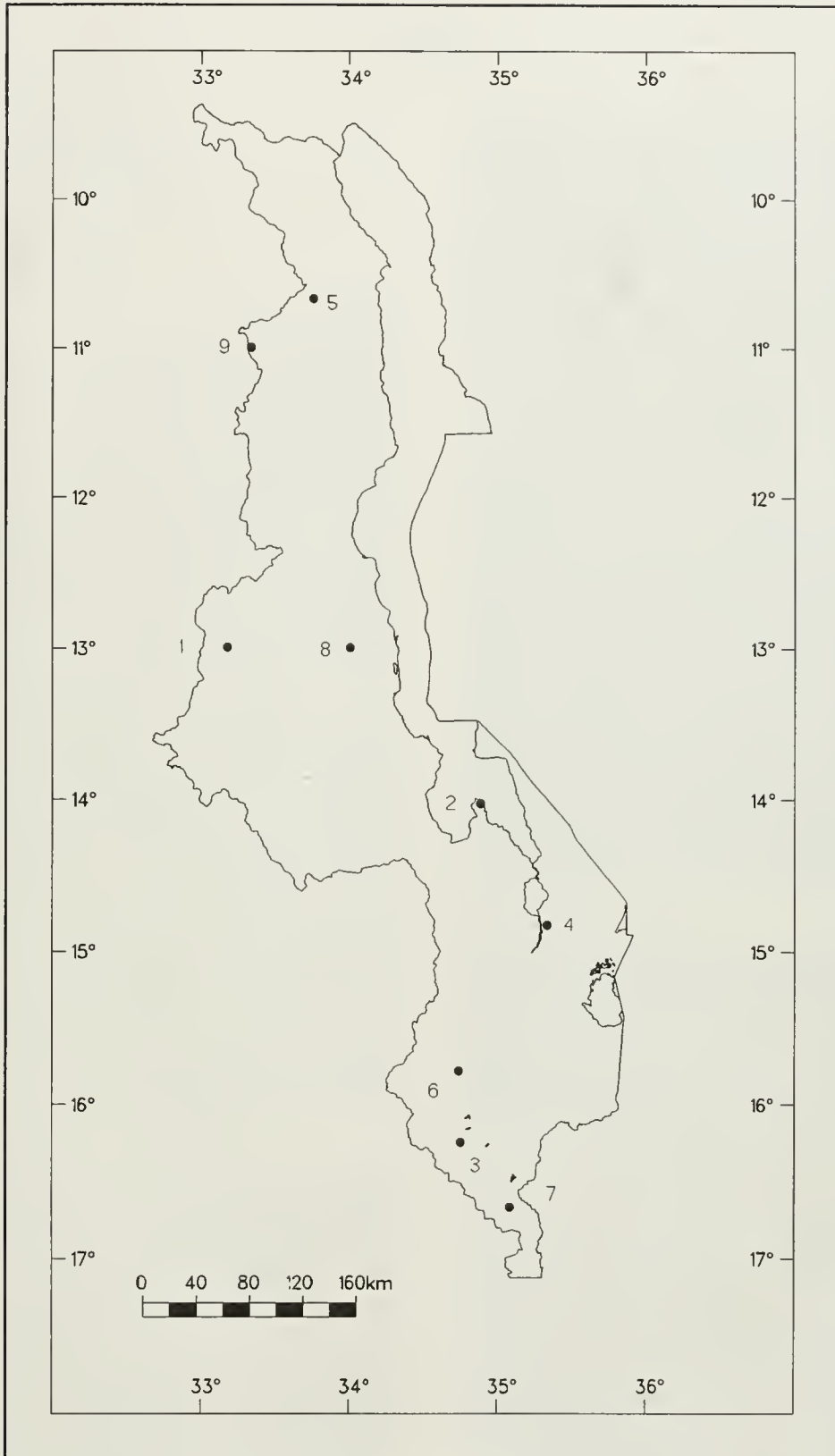
Forestry Department. The Forestry Department may also make rules for the management of such areas.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Kasungu	II	231,600	1970
2	Lake Malawi	II	8,700	1980
3	Lengwe	II	88,700	1970
4	Liwonde	II	53,800	1973
5	Nyika	II	313,400	1965
	<i>Game Reserves</i>			
6	Majete	IV	69,100	1955
7	Mwabvi	IV	13,500	1953
8	Nkhota-Kota	IV	180,200	1954
9	Vwaza Marsh	IV	98,600	1977
	<i>World Heritage Site</i>			
	Lake Malawi National Park	X	9,400	1984

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Malawi

MALI

Area 1,240,190 sq. km

Population 8.1 million (1990)

Natural increase: 3.0% per annum

Economic Indicators

GNP: US\$ 230 (1988)

GDP: US\$ 221 (1987)

Policy and Legislation Traditionally, land could not be appropriated by individuals, but was managed collectively under the guidance of village elders. Occupation of the land led to recognised rights of use. Sanctuaries of sacred woods were respected, and a relatively secret magic-fetish sect imposed regulations concerning hunting. Hunting permits did not exist, but animals were only killed following authorisation from the chief during a public ceremony. Strict sanctions were imposed for contraventions of these measures, possibly entailing selling the culprit off as a slave. When Islam was introduced to the country, sacred places and the practice of religious fetishism began to disappear. Although a love of flora and fauna is taught in the religion, this was seldom followed and led to irrational exploitation of resources (Sanogho, 1983).

Current legislation relating to protection of natural resources has its origins in two decrees promulgated by the French colonial authorities during the era when Mali formed part of the territory known as French West Africa. A decree of 4 July 1935 established the forestry regime in French West Africa, and another decree of 18 November 1947 controlled hunting in French overseas territories. The principal themes of these texts were the notion that unoccupied land belonged to the state, the maintenance of customary practices alongside modern regulations and the creation of privileged zones (classified forests and hunting reserves) for the satisfaction of colonial needs. The 1947 Decree did not take into account the magic-religious role of hunting. Despite, or because of, these pieces of legislation, customary rights continued strongly to influence the use of natural resources (Sanogho, 1983).

Since independence, these acts have been superseded. Decree (Ordonnance) No. 60/CMLN of 11 November 1969, concerning institution of a hunting code (portant code de la chasse), replaced the original 1937 Decree, but has itself been replaced subsequently by Law. No 86-43/AN-RM concerning hunting and the conservation of fauna and its habitat (portant code de chasse et de conservation de faune et de son habitat) (see Annex). Categories defined under this law are: strict nature reserve (réserve naturelle intégrale); national park (parc national); faunal reserve (réserve de faune); special reserve (réserve spéciale) or sanctuary (sanctuaire) and sport hunting zone (zone d'intérêt cynégétique).

A forest code was established under Law No. 68-8/AN-RN of 17 February 1968. This was subsequently replaced by the current piece of legislation, Law No. 86-42/AN-RM of 30 January 1986 promulgating the forest code (portant code forestier) (see Annex). The Forest Code deals with areas of land which are classified (classified forest and protected area) by decree of a Council of Ministers, and thus subject to particular restrictions, as well as with the remaining areas of protected state forest. These are protected by general regulations aimed at slowing the rate of desertification.

A thorough review of forest and hunting legislation in Mali (not including the two current pieces of legislation) is given by Sanogho (1986). The country has no national conservation strategy.

International Activities Mali became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 5 April 1977, under which one site has been inscribed, on the basis of beauty resulting from the man/nature interaction, rather than natural features alone. The country acceded to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) on 25 May 1987, under which three sites have been inscribed. One site has been accepted as a biosphere reserve under the Unesco Man and the Biosphere Programme. Mali has ratified the 1968 African Convention on the Conservation of Nature and Natural Resources, which provides definitions of strict nature reserve, national park and special reserve.

Administration and Management Management of national parks and faunal reserves is the responsibility of the National Parks Department (Direction des parcs nationaux). The Forest Service is responsible for management of land within the forest domain, including classified forests. Both the Forest Service and National Parks Department form part of the Department of Water and Forests (Direction générale des eaux et forêts), in the Ministry of Natural Resources and Livestock.

There are many donor supported forestry projects in the country, of which two, supported by the Coopération Suisse (Sikasso) and IUCN, deal directly with natural forest management. Recently, IUCN/WWF have provided help in the creation and development of reserves in the inner Niger delta, although currently WWF does not have any programmes within the country. IUCN, after a survey of the inner delta, decided that there was no possibility of establishing a fully protected area. Most large mammals had disappeared and the drought had placed many of the bird nesting areas in jeopardy. Hence, IUCN decided to work on conflict resolution with the goal of combining conservation with more

stable economics and more assured access by local populations to natural resources (Warshall, 1989).

For historical reasons, the government has not given ecosystem protection a high priority. The value of intact ecosystems as "national treasures" or sources of educational, national pride or tourist income has not been widely recognised. The recent drought has increased awareness of the need to maintain biodiversity, but at the same time has strained the nation's resources. In general, the Department of Water and Forests has not had the finance, manpower, military strength nor the strong support required from upper levels of government to prevent degradation of protected areas (Warshall, 1988, 1989).

A recent IUCN general survey report called the situation in Mali "particularly serious." Unesco designated the only national park, Boucle de Baoulé, a biosphere reserve in 1982, but provided too little funding too late to save the more important species within the national park. The reserve has been under pressure from groundnut growers, transhumant pastoralists, Mauritanian poachers, hunters, firewood cutters, and sedentary farmers. Most animals within the park are shy, eliminating its value for tourism (Warshall, 1989). Justification of the park is questioned in a report (IUCN, 1988), which also includes proposals for the reserve's future management. Villages have become established within Fina Reserve because no overall natural resource management plan nor administration exists. Many of the forest reserves (about 90) are reserved only in name. The majority have no management plan and vast areas are beyond the control of the limited staff of the Water and Forests Department (Warshall, 1989).

Despite the current strong law, the actual lack of protection has meant that in the last two decades, two species once found in Mali have become globally extinct (scimitar-horned oryx *Oryx dammah* and korrigum *Damaliscus lunatus korrigum*), and about thirteen other animal species are in danger of extinction within the country. For humans, the drought has meant a new look at land tenure, tree tenure, pasture and water rights and a full realisation of the need to reconcile confusing traditional, colonial and post-independence rules (Warshall, 1989).

Systems Reviews Mali is a land-locked country, largely comprised of the Sahara desert and the Sahel region, to the east of Mauritania and Senegal and west of Niger. It extends from Guinea, Côte d'Ivoire and Burkina Faso, 1,675km northwards across the Tropic of Cancer to Algeria. The country lies mostly between 200-500m, apart from two lowland areas, and presents a flat or gently undulating landscape. The only patches of highland are along the southern boundaries and eastern boundaries. In the south is the Manding Plateau near Bamako, an extension of the Fouta Djallon Mountains of Guinea, and in the east the Adrar des Iforhas (727m), a southern extension of the Ahaggar massif, responsible for locally higher rainfall. The majority of the country

drains to the Niger River system. Drainage in the extreme south-west is by the Senegal River to the Atlantic Ocean. The vast northern areas are virtually rainless and have no important drainage system, apart from that leading to two depressions in the desert in the far north. The principal wetlands are riverine. The most important wetland in West Africa occurs in Mali, where the Niger crosses the bed of a prehistoric lake and because of the flatness of the terrain, divides into many channels and lakes in what is often referred to as the "inland delta" (DNEF/IUCN, 1986; Hughes and Hughes, 1991; Warshall, 1988, 1989).

The vegetation reflects the decrease in rainfall in the country from south to north. In the extreme south is Sudanian woodland with abundant *Isobertinia*, to the north of which is a wide band of undifferentiated Sudanian woodland, followed by Sahelian *Acacia* deciduous bushland and wooded grassland. Semi-aquatic vegetation occurs within these last two areas in the inland delta region. To the north the northern Sahel transition zone gives way to the Sahara biotic zone comprising desert dune with vegetation, to the east of which is an area of regs, hamadas and wadis. The extreme north comprises bands of desert dunes without vegetation and absolute desert (Warshall, 1988).

Most of the country has a long history of human use. The oases have been planted with date palms, the Sudanian zone and south Sahel frequently burned and the southern woodlands harvested for timber. In addition, and most significantly, for two decades the country's biological resources have been hammered by the Sahelian/Sudanian drought. From the point of view of Mali's plant life, "desertification" has led to reduction of total vegetation cover; stunting of perennial plants; elimination of organic matter from the soil by leaching or erosion and disappearance or replacement of plants capable of remaining alive for a few months by less useful plants which mature and die in only a few weeks (Warshall, 1989). Overgrazing of the resultant poor pastures and destruction of woodland cover for firewood has led to serious erosion and desertification. For wildlife, the drastic loss in numbers (including extinction of some species) requires a reduction of hunting pressure until the populations of surviving species can recover. With the clearance of forest, the overall climate in the Sahel is becoming drier and accelerating the desertification process. An overview of the problems of desertification within the Sahel is given in *The IUCN Sahel Report* (IUCN, 1986).

The first national park, Boucle de Baoulé, and seven faunal reserves were established during the 1950s in the south of the country in the Sudanian zone, following promulgation of decrees during French colonial rule. The three Ramsar sites, biosphere reserve and World Heritage site were established between 1982-1989. The Saharan zone and its habitats have no protection in Mali. Excluding classified forests, the protected areas system currently covers 3.7% of the country. There are approximately 100 classified forests which total

6,450 sq. km in the Sudanian zone and 710 sq. km in the Sahel.

The three Ramsar sites provide some protection within the Inner Niger delta. The main continuing threat to the delta's richness comes from upstream dams and diversions that lower the flood peak and change the timing of the floodwave. Conflicting rules and laws governing land usage have led to the degradation of the flooded woodland forests, abuse of the "bourgu" plant association with lowered grazing capacity and the invasion of less useful plants (Warshall, 1988). No part of the Sahara within Mali has received attention for protection, even though certain ephemeral water bodies and gorges are important for the maintenance of bird biodiversity. The two extinct species of antelope were both Sahelian/Saharan dwellers, in addition to which, the vulnerable addax is a Saharan resident. The most important Saharan and, perhaps, Saharo-montane area is probably the Adrar des Iforhas which has been recommended officially for protection. The government is also considering establishment of a new national park or wildlife reserve (Bafing) fairly near Bamako. This is partly to compensate for loss of habitat which will be caused by flooding associated with a new dam on the Bafing River at Manantali. The area is not particularly rich in wildlife, but has scenic beauty and is fairly easily accessible. It may protect the habitat of 50-150 chimpanzee.

A US-AID report (Warshall, 1988), *Opportunities for sustained development*, provides a thorough review of existing protected areas in Mali, as well as areas in need of protection. Recommendations given in the report include: study of water release from the Selingue Dam; support of the IUCN projects of conflict resolution of natural resources within the inner delta, and restoration of "bourgu" by improved local management; investigation of possibility of establishing a reserve in the Adrar des Iforhas range in the north; better definition of areas with endemic birds in enclosed forest and the northern finger of the Guinean/Congolian rain forest near the Côte d'Ivoire/Guinea border; establishment of Bafing National Park; responsibility for mitigation methods following flooding by the Manantali Dam to be given to Senegal River Basin Authority (OMVS). According to the report, Mali has the best environmental education programme observed in West Africa. *Walia* magazine, based in Mopti, and school follow-ups already having begun to influence thinking among villagers in the inner Niger delta.

A more recent report by Warshall (1989) provides the most thorough survey of the country's biological resources, as well as a comprehensive bibliography. Three priority project proposals involve protected areas: the proposed Bafing and Gourma national parks, and redevelopment of the biosphere reserve comprising Boucle de Baoulé National Park and adjacent reserves. The proposed Gourma National Park, to the north-east of Mopti, has the last remaining viable population of elephants in Mali; the northernmost viable population in

Africa; and the only known Sahelian population. The proposed Bafing National Park comprises the last relatively intact Soudanian/Guinean woodland and forest in Mali. The biosphere reserve, badly degraded from lack of action, requires restructuring to create an integrated zone complex of forest reserves, biological reserves, relocated villages, buffer zones with game management, and natural resource agreements. The fourth project involves the inner delta, within which the three Ramsar sites are situated. Rather than gazetting the area, the overall goals of the project involve improved water management, and improved land management, soil conservation and plant usage by creating natural resource agreements between conflicting production systems, establishing firmer rights to land and fishing areas, and reducing conflicts between national administrative structure and traditional systems (Warshall, 1989). MacKinnon and MacKinnon (1986) make recommendations to extend and improve the protected areas system. IUCN (1987) largely repeats these proposals. A report by Newby (1984), although focusing on Niger, in general refers to the value of protected areas in the Sahel and hence is relevant to Mali. The protected areas network in the Sahel is also reviewed in IUCN (1989).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No. 86-43/AN-RM portant code de chasse et de conservation de la faune et de son habitat (concerning the hunting code and conservation of the fauna and its habitat)

Date: 24 March 1986

Brief description: Provides for general protection measures for the fauna as well as definitions of categories listed below, and clarifies customary rights of use

Administrative authority:

Designations:

Réserve naturelle intégrale (Strict nature reserve)
Areas set aside "for the free play of natural ecological factors" with no external intervention except to allow measures to protect the reserve itself

Activities strictly prohibited include: hunting, fishing; forest, agricultural or mining exploitation; grazing; any prospecting, drilling or mining or activity altering the ground; water pollution; any act to harm or alter the fauna and flora; any introduction of exotic plant or animal species.

Also prohibited are: residence, entrance; circulation; camping; flying below 200m without special permission from the Director of Water and Forests.

Parc national (National park) For the protection, conservation and propagation of natural flora and fauna and for the protection of sites, landscape or geological formation of scientific or aesthetic value, in the public interest and for recreation, providing this does affect the previously listed goals

Activities prohibited include: hunting, slaughter or capture of animals, destruction or collection of plants, other than for scientific reasons or management needs; in which case necessary measures are taken by the park authorities or under their control.

Activities prohibited in strict nature reserves are equally prohibited in national parks, other than in cases of necessity.

Classification and alienation of strict nature reserves and national parks is by legislative authority following the classification procedure of the classified forest domain described in the Forest Code.

Réserve de faune (Faunal reserve) Area for the conservation, management and propagation of wildlife, and for the protection and management of its habitat. Except for the achievement of these objectives, hunting, killing or capture of fauna is prohibited.

Habitation or other activities are regulated or prohibited.

The decree creating the reserve determines the particular conditions applying.

Réserve spéciale (Special reserve) or Sanctuaire (Sanctuary) For the protection of characteristic communities of wild animals or birds or the protection of particularly threatened animal or plant species as well as the biotopes indispensable for their survival and in which all other interests or activities are subordinate to the realisation of this objective.

Management favours in particular those species for which the sanctuary was created, the decree creating the sanctuary determines the particular conditions and the management regime.

Faunal reserves and sanctuaries are classified by decree of the Council of Ministers, following proposition of the Minister responsible for Water and Forests.

Zone d'intérêt cynégétique (Sport hunting zone) Area in which game and hunting are of scientific interest or economic importance and where the fauna is sufficient, such that, without putting undue stress on other sectors of the economy, it may be managed

to reach an optimum yield compatible with other forms of exploitation.

May be established around all categories of protected area listed above.

All sport hunting must be registered at the hunting office of the Service des Eaux et Forêts, and hunters must be accompanied by an agreed agent.

Areas are designated by order of the Minister responsible for Water and Forests following proposition by the National Director for Water and Forests. Management methods and planning measures are the object of regulations.

Source: Original legislation in French

Title: Loi No. 86-42/AN-RM portant code forestier (promulgating the Forest Code)

Date: 30 January 1986

Brief description: Provides definitions of protected areas listed below.

Also concerns: conditions governing land clearance; classification procedures; use rights; working of the state forest domain; brush fires.

Administrative authority: Service des Eaux et Forêts, de l'Élevage et de l'Agriculture

Designations:

Forêt classée (Classified forest) Naturally forested land or land planted with species not providing agricultural produce.

Part of the state forest domain.

Land which is the object of an act of classification, subjecting them to a special restrictive regime concerning rights of use and exploitation.

Périmètre de protection (Protected area) Land which is the object of an act of classification.

Land in which forest clearance is prohibited.

Includes: mountain slopes presenting a gradient of 33° or more; land susceptible of gullying and dangerous slumping; shifting sand dunes; seriously depleted land in the vicinity of urban built-up areas.

Optional classifications as protected areas may be made in respect of any land without plant cover or insufficiently wooded requiring regeneration, in particular land in the Sahel zone.

Any reforestation carried out by the state outside classified areas shall automatically fall within such areas irrespective of whether or not explicit provision has been made in a classification enactment for such reforestation.

Classification of both categories is by decree of the Council of Ministers by order of the governor of the region in which the land is situated. Precise details to follow to enable land to be classified and declassified are given. The classifying text for each area mentions rights of use permitted. Hunting may in no instance be considered a right of use. Rights of use may concern: the forest soil; circulation on foot or by vehicle; forest fruit and produce; grazing for domestic animals.

Protected forest area All remaining forest land, not subject to a classifying order.

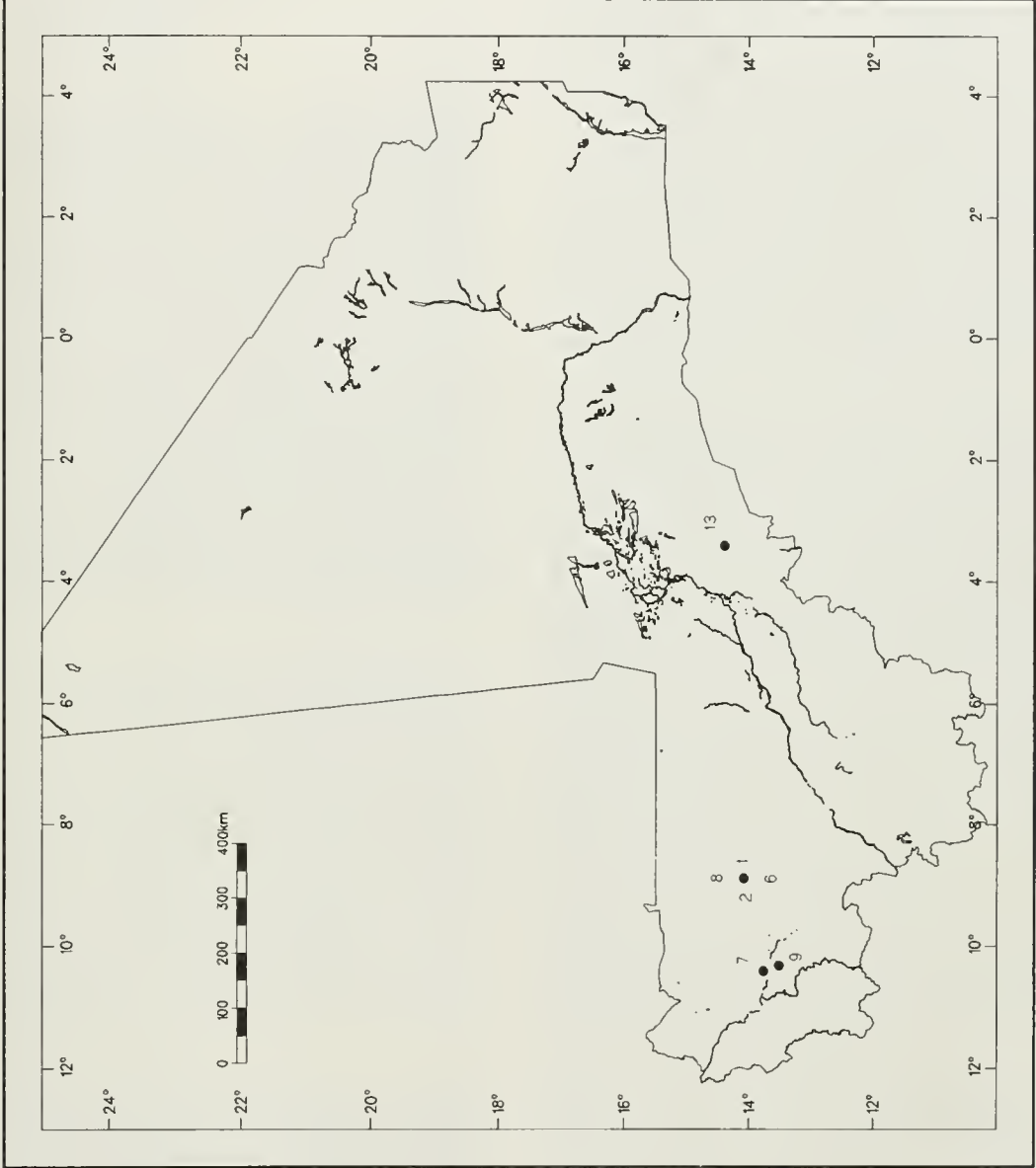
Protected by general regulations.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Park</i>			
1	Boucle du Baoule	II	350,000	1954
	<i>Faunal Reserves</i>			
2	Badinko	IV	193,000	1951
3	Bafing Makana	IV	158,989	1990
4	Banifing-Baoule	IV	13,000	1954
5	Doventza	IV	1,200,000	1960
6	Fina	IV	136,000	1954
7	Kenie-Baoule	IV	67,500	1952
8	Kongossambougou	IV	92,000	1955
9	Sounsou	IV	37,600	1954
10	Talikourou	IV	13,900	1953
	<i>Partial Faunal Reserves</i>			
11	Ansongo-Menaka	IV	1,750,000	1956
12	Gourma Elephant	IV	1,200,000	1960
	<i>Sanctuary</i>			
13	Falaise de Bandiagara Natural/Cultural	VII	400,000	
	<i>Classified Forests</i>			
14	Bossofola	VI	12,000	1944
15	Faya	VI	79,822	1954
16	Nafadji	VI	43,000	1952
	<i>Ramsar Wetlands</i>			
	Lac Horo	R	18,900	1987
	Seri	R	40,000	1987
	Walado Debo/Lac Debo	R	103,100	1987
	<i>World Heritage Site</i>			
	Falaise de Bandiagara	X	400,000	1989

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Mali

MAURITANIA

Area 1,025,520 sq. km

Population 2,000,000 (1989)

Natural increase: 2.7% per annum

Economic Indicators

GDP: US\$ 453 (1987)

GNP: US\$ 440 (1988)

Policy and Legislation Legislation providing for protected areas is given in Law No. 75-603 of 15 January 1975 concerning the hunting code and protection of fauna (Code Loi No. 75-603 portant Code de la Chasse et de la protection de la faune) (see Annex). This provides definitions of: national park (parc national), regional park (parc régional), faunal reserve (réserve de faune), hunting reserve (réserve de chasse) and special reserve (réserve spéciale). Decree No. 82 171 concerning the forest code (Ordonnance portant code forestier) of 15 December 1982 (see Annex) provides definitions of areas within the classified forest domain, comprising classified forest (forêt classée); protection area (périmètre de protection); reforestation area (périmètre de reboisement), as well as land in the protected forest domain (domaine forestier protégé). The forest code also provides details of procedures to follow to classify land, regulations concerning customary rights of use, and penalties to be imposed for infractions against the code.

International Activities Mauritania became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 2 March 1981, under which one site has been inscribed. The country acceded to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) on 22 October 1982, under which the same site is also inscribed. No biosphere reserves have been established under the Unesco Man and the Biosphere Programme. Mauritania is a signatory to the 1968 African Convention on the Conservation of Nature and Natural Resources, which provides definitions for strict nature reserve, national park and special reserve.

Administration and Management According to the Draft Environmental Report on Mauritania (Unesco, 1979), the Nature Protections Service within the Ministry of Rural Development (Ministère du développement rural) is responsible for the conservation of waters and forests and the protection of wildlife and control of hunting. The Committee for Conservation and Nature Protection (Comité pour la protection et la conservation de la nature) is under the aegis of the Ministry of Rural Development. Preliminary advice must be obtained from this committee for: any activity liable to change the natural environment: all questions relating to the protection of soils, water resources, flora

and fauna; the conservation and rational use of natural resources; national parks and nature reserves.

IUCN has signed an agreement with the government which confirms officially the cooperation that has existed for many years between the government and IUCN Mauritania. The agreement provides for cooperation in establishing a national conservation strategy, technical support and training, and helps in coordinating activities (IUCN, 1990a, 1990b). IUCN, with backing from the Dutch government, is working with the Ministry of Development to provide technical support to the newly-created Diawling National Park, and to help provide a management plan (CNPPA, 1991; Thiaw, 1991). The Stichting Den Helder Wereldwijd, a Dutch research organisation, is providing help for Banc d'Arguin National Park. WWF also has a project there concerning management and sustainable use, and the provision of logistical support (WWF, 1991).

The Senegal River Basin Development Authority is responsible, amongst other things, for producing environmental impact assessments of the river. The authority, in collaboration with the Ministry of Rural Development and other national organisations (in particular the National Association for Rural Development), undertook several feasibility studies which, in 1988, enabled the adoption of the blueprint for management of the Mauritanian delta. This management plan divides the delta into various areas and basins according to the aptitude of the soil for irrigated agriculture, cattle grazing or nature conservation. It was on the basis of these studies that the government adopted the decree for the creation of Diawling National Park, prepared by experts from the Department of Nature Protection. The long period over which the park was planned has enabled the involvement of all departments and organisations concerned, and allowed a close dialogue with local people living on the edge of the park. An important aspect of the management plan was to find solutions to the problems affecting the standard of living of local populations. The management plan includes the inundation of a buffer zone where cattle grazing and traditional fishing will be allowed (Thiaw, 1991).

Following proposals from the Department for Nature Protection, anxious to make hunters more responsible, a Hunting Association (Association de Chasseurs) was established and recognised by the Ministry of the Interior in 1985. Objectives of the association include participation in faunal management, and assisting the Department in the battle against poachers (Thiaw, 1989). A sport hunting zone (zone d'intérêt cynégétique), Keur Macene, was established, which the multinational company, Air Afrique, was initially allowed to manage. However, in 1983 the contract enabling this was denounced by the Department for Nature Protection, as they considered the lease to be harmful. The touristic

potential of Keur Macene is considered to be particularly good, in view of the construction of the international route between Saint-Louis and Nouakchott, the proximity of Djoudj National Park and Djeuss Sport Hunting Zone in Senegal and Diawling National Park (Thiaw, 1989).

Systems Reviews Mauritania, the most western of the Sahel countries, borders the Atlantic Ocean on the west. To the north the country largely borders the Spanish Sahara, with Algeria bordering its north-east tip. Mali borders all the east and much of the south. The Senegal River forms the remainder of the southern border between Mauritania and Senegal. The country has an Atlantic coastline of 815km and a broad coastal plain below 100m. This extends inland for over 300km in the south and 70km in the north. East of this is a flat interior peneplain (Hughes and Hughes, 1991).

The Sahara desert occupies the eastern two-thirds of the country. On the north bank of the Senegal River, a band of Sahelian *Acacia* deciduous bushland and wooded grassland stretches the width of the country. Another band further north comprises a semi-desert shrubland mosaic transition zone. North and west of this zone, vegetation of regs, hamadas and wadis is interspersed with desert dunes with vegetation. To the west, on the coast, is an area of Atlantic coastal desert. To the east, desert dune with vegetation gives way to desert dune without vegetation. The middle, north and north-east is absolute desert (IUCN, 1983; J.C.J. van Wetten, pers. comm., 1991). Levels of endemism of the flora are not known, but probably low (Davis *et al.*, 1986). By far the most important wetland is the complex of Banc d'Arguin just off the coast between Nouadhibou and Cap Timiris (Hughes and Hughes, 1991). Other wetlands of international importance are present. Due to the rarity of water points in the Sahel, however, they are under great demand from developers (Thiaw, 1989).

Mauritania is a "front-line" state in the war against environmental degradation. Over the last 200 years, and particularly over recent decades, sub-soil water levels have dropped by many metres, which has had a significant impact on the vegetation (IUCN, 1982). The drought has led to rapid desertification, and consequent loss of land to both grazing and subsistence agriculture (IUCN, 1986; Unesco, 1979). An overview of the problems of desertification in the Sahel is given in IUCN (1986). The tidal flats of Mauritania form one of the most important wintering areas for migratory birds along the East Atlantic flyway (Ens *et al.*, 1989). Although still an extremely important country for migratory birds, the fauna is seriously depleted. Regular poaching has eliminated the resident elephant population; a few individuals appear seasonally from Niokolo-Koba National Park in Senegal (Thiaw, 1989).

Agriculture is based mainly on rainfed crops and on the seasonally flooded alluvial zones along the Senegal River and its tributaries. Recent embankments and dams in the river have reduced this recession agriculture in

favour of irrigation agriculture (J.C.J. van Wetten, pers.comm., 1991). Nomads have, to a large extent, become sedentary: of the people nomadising in 1972, only 17% were doing so in 1982. This reduction is due to financial constraints which have prevented nomads from building up their herds after the 1972/3 droughts; exodus of young people from the rangelands; reduction in quality of rangelands; disappearance of wildlife, especially addax (IUCN, 1982).

The protected areas system currently consists of nine reserves, covering only 1.7% of the country. The first protected area, El-Aguer Faunal Reserve, was created in 1937. At the time, the zone contained an important fauna: until 1920, 400 elephants inhabited the area but the introduction of fire-arms led to their extermination by 1964. Banc d'Arguin National Park was created in 1976, and in 1991, after approximately 10 years of preparatory studies, the second national park, Diawling, was created. Situated on the right bank of the Senegal River opposite Djoudj National Park in Senegal, Diawling is designed to ensure the conservation of a significant part of the delta in the face of considerable alterations brought about through the Senegal River Basin Development Programme (Thiaw, 1991).

Establishment of a new Ramsar site, Aftout-es-Saheli, in the northern part of the Senegal River delta, is recommended by van Wetten (1990). This area is one of the last remaining undisturbed wetlands in the Mauritanian part of the Senegal delta. The same recommendation is given in Van Wetten *et al.* (1990) in which recommendations are also made for establishment of lakes Aleg and Rkiz as reserves as well as protection of inundated forests. In MacKinnon and MacKinnon (1986) support proposals to create the now established Diawling Reserve. IUCN (1987) repeats the same proposal, and also includes recommendations for more intensive management of the Plateau d'El Aguer, and improved protection and management of Banc d'Arguin National Park, to include incorporation of Cap Blanc to protect adequately what is possibly the world's only viable population of monk seals. A report by Newby (1984), although focusing on Niger, in general refers to the value of protected areas in the Sahel and hence is relevant to Mauritania. The protected areas network in the Sahel is also reviewed in IUCN (1989).

Addresses

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Centre National de Recherches Océanographiques et des Pêches, BP 22, NOUADHIBON

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No. 75-603 portant Code de la Chasse et de la protection de la faune (Law No. 75-603 concerning the hunting code and protection of fauna)

Date: 15 January 1975

Brief description: Provides amongst other things, definitions of the protected areas listed below

Administrative authority:

Designations:

Parc national (National park)

Parc régional (Regional park)

Réserve de faune (Faunal reserve)

Réserve de chasse (Hunting reserve)

Réserve spéciale (Special reserve)

Source: Original legislation in French

Title : Ordonnance No. 82 171 portant code forestier (Decree concerning the forest code)

Date: 15 December 1982

Brief description: Provides amongst other things, definitions of the protected areas listed below

Administrative authority:

Designations:

Domaine Forestier Classé

Forêt classée (Classified forest) Area in which clearing is not permitted.

Vegetated areas, of which the principal products are wood, bark and gum, which have been the object of a classification text, subjecting them to a particular strict regime concerning the exercise of customary rights of use and exploitation.

Périmètre de protection (Protection area) Area in which clearing is not permitted.

Officially classified as périmètre de protection.

Périmètre de reboisement (Reforestation area)
Area in which clearing is not permitted.

Land which is little or insufficiently wooded, comprising: sloping land of 35° or more; dunes or moving sand; degraded land in the urban areas.

Domaine Forestier Protégé

Land outside the domaine forestier classé, in which clearing is not permitted, but which has not been the object of a classification order.

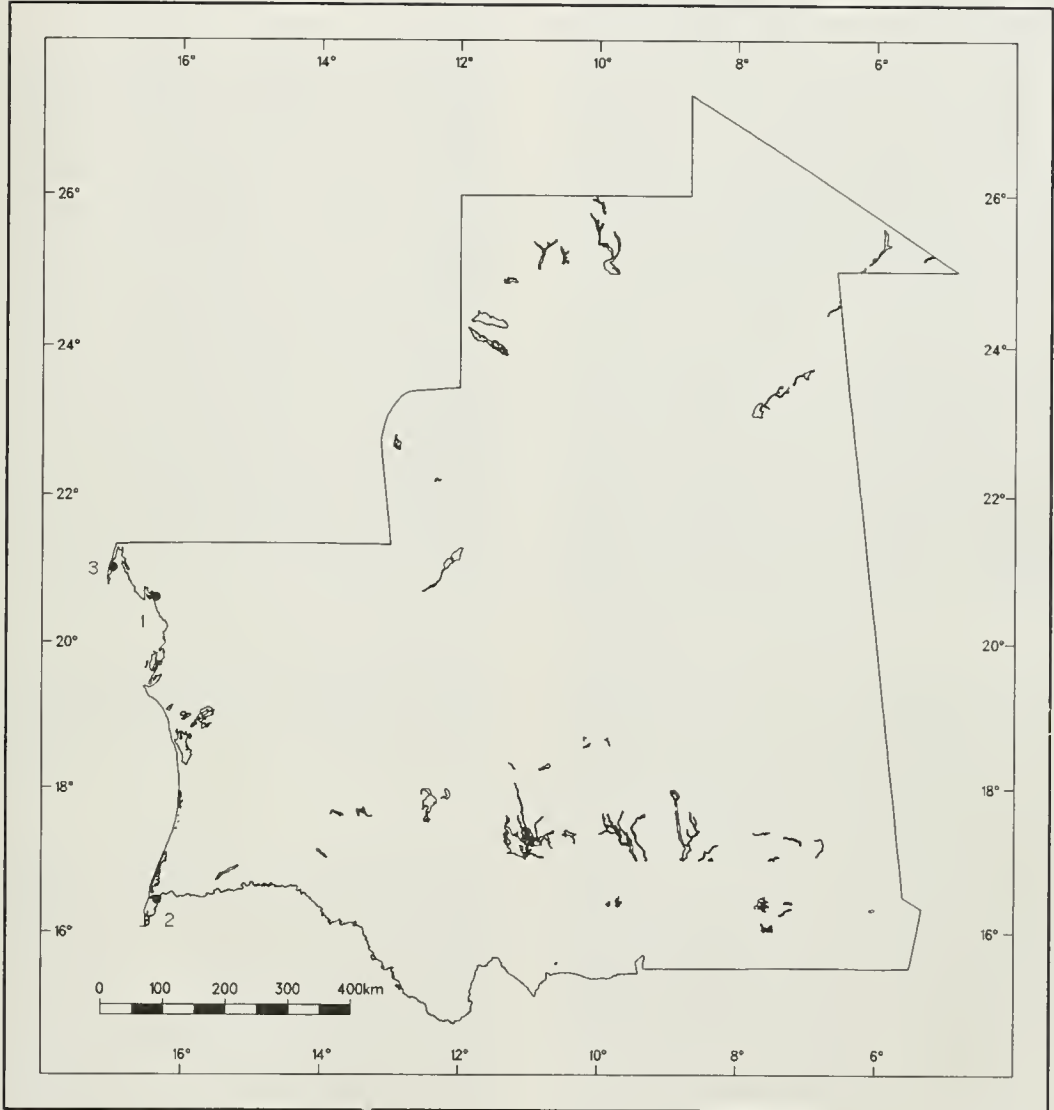
Throughout the country, forest clearing is prohibited: on slopes of mountains, hills or plateaux where there is a risk of erosion; along banks of permanent or semi-permanent water courses; head waters; in areas populated with economically important species; in zones protected for public health reasons or for national defence.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Banc d'Arguin	II	1,173,000	1976
2	Diawling	II	13,000	1990
	<i>Integral Reserve</i>			
3	Baie du Levrier (Cap Blanc)	I	310,000	1986
	<i>Partial Faunal Reserve</i>			
4	El Agher	IV	250,000	1937
	<i>Biosphere Reserve</i>			
	Macchabee/Bel Ombre Nature Reserve	IX	3,594	1977
	<i>Ramsar Wetland</i>			
	Banc d'Arguin	R	1,173,000	1982
	<i>World Heritage Site</i>			
	Banc d'Arguin National Park	X	1,200,000	1989

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Mauritania

MAURITIUS

Area 1,860 sq. km

Population 1,082,000 (1990)

Natural increase: 1.08% per annum

Economic Indicators

GDP: US\$ 1,673 per capita (1987)

GNP: US\$ 1,810 per capita (1988)

Policy and Legislation Arising from the World Conservation Strategy (1980), and the reports of Sir Peter Scott (1973) and Proctor and Salm (1975), a conservation strategy has evolved. The objectives are, *inter alia*, to ensure the sustainable utilisation of species and ecosystems, including fish, wildlife, forests and grazing lands (MAFNR, 1985). In conjunction with this strategy, marine conservation policies support the establishment of specially protected areas to protect and preserve the marine environment and its resources, encourage the formulation and/or enforcement of appropriate legislation, and make provision for the development of management plans for important marine areas (MAFNR, 1985). The approved forest policy, under which the Crown forest estate is managed, aims *inter alia* to reserve forest areas which will supply in perpetuity all forest produce required by the people for agricultural, domestic and industrial purposes, and to plan cooperatively with other land interests for the successful management of the forest estate (Forestry Service, 1988).

Overall planning and development is guided by the Town and Country Planning Act, 1954. Under this Act, protection of the environment is taken into account in any development schemes and the Act may be used to safeguard natural areas, as well as coastal and marine parks.

The first comprehensive game law, offering protection to certain species and restricting hunting, was proclaimed in October 1767 (Cheke, 1987a). A decade later, the Game Ordinance of 1869 and the Rodrigues Game Regulations of 1883 were enacted. Subsequent laws were passed, culminating in Wildlife Act No. 33, 1983 which amends and consolidates laws relating to game, camarons and shrimps, and makes stronger provision for the protection of wildlife. Under this Act, the Minister may prohibit the hunting of game in any specified area. The Ancient Monuments and National Reserves Ordinance of 1944, provided for the establishment of nature reserves and the appointment of the Ancient Monuments and Nature Reserves Board. Under this Act, nature reserves could be established on public or private lands and the Board advised the government on matters related to protected areas and the preservation of flora and fauna. This Act was replaced by the National Monuments Act No. 9, 1985 which makes provision for nature reserves and the creation of a new National Monuments Board (Annex). The Forest

and Reserves Act No. 41, 1983, together with its amendment (The Forests and Reserves (Amendment) Act No. 1, 1986), consolidates and repeals earlier laws, including the Rodrigues Forests Regulations, 1882, the Wood and Forests Act, and the Forests and Mountain and River Reserves Act No. 18, 1971. This Act makes provision for the creation and management of road and nature reserves, national forest and the protection of privately-owned mountain and river reserves (see Annex). It also makes provision for the use of unsurveyed forest, sets out procedures to deal with offences concerning forest resources and reserves, and provides for the establishment of a Nature Reserves Board. The Crown Land (Amendment) Act No. 6, 1986 and the Pas Géométrique (Amendment) Act No. 7, 1986 give powers to the Minister of Housing, Lands and the Environment (MHLE) to evict squatters on Crown lands and pas géométriques (Forestry Service, 1988).

The Maritime Zones Act, 1977 makes provision for the protection of the marine environment through the creation of designated areas and historic waters, while the Fisheries Act, 1980 provides for the creation of reserved areas (see Annex). The Fisheries Act also prescribes matters in relation to the trading and sale of fish, licensing, the use of fishing implements, closed periods, offences and penalties, and the creation of a Fisheries Advisory Board. The Fisheries Regulations, 1983, under the Fisheries Act, provides for the establishment of six reserved areas.

Although protected areas legislation and policy has generally been adequate in answering the country's needs, it has evolved piecemeal without a view to the overall national picture (D'arif, 1983; Proctor and Salm, 1975). As a result of this pragmatic approach, gaps have arisen in the development of legislation. One such gap is the lack of formal gazetteement and land dedicated to forestry or wild-land uses. Apart from nature reserves playing a conservation role and privately-owned mountain and river reserves serving a predominantly protection function, Crown lands have loosely been regarded as forest reserves by the Forestry Service, available for afforestation until they were required for some other purpose. The creation of a category of forest, denoted as national forest under the Forest and Reserves Act of 1983 has, in part, addressed this issue.

Legislation dealing with the creation, protection and management of marine nature reserves and turtle reserves will be promulgated in the near future to safeguard these critical ecosystems. Regulations with respect to the protection of mangroves are also to be enforced (MAFNR, 1985). Scott (1973), together with Proctor and Salm (1975), were in favour of an enabling act (National Parks and Nature Conservation Act) which would allow for the creation of national parks. To date, this recommendation has not been taken further,

although this could soon change with the establishment of Black River National Park (Owadally, pers. comm., 1991).

International Activities At an international level, Mauritius participates in the Unesco Man and the Biosphere Programme, under which one site was designated a biosphere reserve in 1977. Mauritius is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) nor to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention). At a regional level, Mauritius is signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area (Annex).

Administration and Management The Mauritius Forestry Service has been in existence since 1777, although it did not become fully autonomous until 1883. In 1849, a Forest Department was established on the island of Rodrigues, which in its early days was involved in tree planting and exchanges with the Botanic Garden on Mauritius (Gade, 1985; Proctor and Salm, 1975). Today, the Forestry Service, a department in the Ministry of Agriculture, Fisheries and Natural Resources (MAFNR), is responsible for all silvicultural operations within the Crown forest estate ensuring the protection of water supply and soils, for protecting privately-owned mountain and river reserves, and for managing state-owned nature reserves, plantations, national forests and *pas géométriques* (Forestry Service, 1985, 1988). The Forestry Service is comprised of a Conservator of Forests, three assistant conservators of forests, two divisional forest assistants and a number of technical officers, clerical employees, nurserymen, artisans and labourers (Forestry Service, 1985; 1988). The total number of staff in 1988 was 3,277, with 1,453 vacancies (Forestry Service, 1990). Territorially, Mauritius is divided into two forest divisions (north and south) which are further subdivided into ranges and sections. Rodrigues constitutes a separate range comprised of three small sections. Its staff are subject to technical direction from the Conservator of Forests, while day-to-day matters are handled by the Island Secretary of the Ministry for Rodrigues (Forestry Service, 1988). As of 1988, the total number of staff on Rodrigues was 275, including 10 vacancies (Forestry Department, 1990). In 1983/84, the Forestry Service accounted for 0.3% of the total national budget and 13.5% of the MAFNR budget (Forestry Service, 1985). The Forestry Service works in close collaboration with the Government Tourist Office, the National Monuments Board, the Nature Reserves Board and the Town and Country Planning Board, along with several other governmental and para-governmental organisations (Forestry Service, 1988).

The Fisheries Division of the MAFNR is responsible for the management of the marine environment including reserved fishing areas. In practice, it has also undertaken

the guardianship and the servicing of certain islets that have been declared nature reserves (Proctor and Salm, 1975). Officers of the Coast Guard, who fall under the Prime Ministers Office, are responsible for guarding designated areas, historic waters and territorial areas (Owadally, pers. comm., 1990). The Fisheries Protection Section and the Forestry Service will, in future, be required to enforce regulations pertaining to the protection of mangroves (MAFNR, 1985).

The Nature Reserves Board, established under the Forests and Reserves Act of 1983, advises the Minister of Agriculture, Fisheries and Natural Resources on all matters relating to the creation and management of nature reserves. The Board consists of a Chairman (Permanent Secretary) and five to eight other members. As outlined in the White Paper for a National Conservation Strategy (1985), a Turtle Reserves Board is to be constituted which would plan management programmes for turtle reserves. The Board will be comprised of individuals from the Ministry for Rodrigues and the Outer Islands, the MAFNR, and the MHLE (MAFNR, 1985). A Marine Nature Reserves Board, under the MAFNR, is also to be created. Over the past two decades, proposals have been put forward for the creation of a Board of Trustees under a National Parks Act. This Board would be responsible to the MAFNR and would advise the Government on matters of policy and legislation. The executive responsibilities of the Board would be carried out by a National Parks and Wildlife Service. This Service would execute government policy as set out in the White Paper and manage national parks and nature reserves (Proctor and Salm, 1975).

There are a number of constraints to protected areas management. The Forestry Service suffers from high labour and transport costs, staff vacancies at all levels, high absenteeism among labourers and inadequate technical training for foresters (Forestry Service, 1985; Proctor and Salm, 1974). Fisheries Laws have not been enforced at times due to a lack of manpower and equipment (D'arif, 1983). This situation has improved, however, with an increase in the number of coastguard officers (Fagoonee, pers. comm., 1986). An expansion of the protected areas network to include marine nature reserves, turtle reserves and national parks may necessitate the constitution of new boards and departments to ensure effective management and protection (Proctor and Salm, 1975).

Systems Reviews Mauritius is a large, volcanic island located off the east coast of Africa. Rodrigues (108 sq. km), which is the furthest east in the Mascarene group, and a number of other smaller islands, come under Mauritian jurisdiction (UNEP/IUCN, 1988). The biogeographic affinities are Mascarene, with some Malagasy links on the main islands; Indo-Pacific Oceanic on remote coralline islands (Stuart and Adams, 1990).

Until 400 years ago, there were three main forest types: a rather open, dry, palm forest in the north; a lowland, semi-wet evergreen forest rich in black ebony; and an upland wet forest (Vaughan and Wiehé, 1937). At high elevations, stunted heath and dwarf forest were also found (Vaughan and Wiehé, 1937). In the 17th century, however, the forests were logged by the Dutch for ebony, in the 18th century by the French for shipbuilding and agriculture, and in the 19th century by the British for land to grow sugar and to establish upland settlements. The 20th century has witnessed further deforestation for sugar, tea and pine plantations, and for the extraction of timber during the two world wars (Cheke, 1987b). Today, natural forest has been reduced to less than 1% of its original cover (Curry-Lindahl, 1971; IUCN/UNEP, 1982; Scott, 1973; Temple, 1974; Temple et al., 1974; UNEP, 1982; UN/Unesco/UNEP, 1982). Coastal ebony no longer exists on mainland Mauritius and only survives on the offshore islet, Ile aux Aigrettes (Parnell *et al.*, 1989). More than 60% of the land area of Mauritius is under sugar cane production with tea cultivation prominent in higher areas (Proctor and Salm, 1975). On the island of Rodrigues, a stratified evergreen forest, 15-20m high, covered most of this volcanic island before human interference (Gade, 1985). By the mid-1800s, most of the indigenous forest had been removed, and since 1879 almost one-third of the native plant species has disappeared (Gade, 1985).

Mangroves are found on the east, south-east and north-east coasts of the country and are relatively abundant in the region of Ile d'Ambre and Ile aux Cerfs (UNEP, 1984). Mangroves have disappeared almost completely from the west coast and the government has made it a matter of priority to establish mangroves where they have been eliminated (MAFNR, 1985). Little remains of upland marsh habitat, apart from a few scattered examples at Petrin which is protected as a nature reserve. These areas may, however, disappear as these lands are to be flooded for the creation of reservoirs. It has been proposed that if Plaine Champagne were protected as a nature reserve or national park, some upland marsh habitat might survive (Proctor and Salm, 1975).

Mauritius is surrounded by 150km (300 sq. km in area) of fringing reef, much of which is under threat from siltation, pollution, and tourist trade exploitation (Stuart and Adams, 1990). This has prompted a few detailed surveys of the reef ecosystem, with subsequent recommendations for protection and management through a system of marine nature reserves (MAFNR, 1985). The Four-year Plan for Social and Economic Development, the definitive statement of government policy for 1971-1975, outlined proposals for the creation of three marine national parks (Government of Mauritius, 1971). Other recommendations have included the creation of special marine areas around Ile aux Aigrettes and Ile Marianne to protect the molluscan fauna there (UNEP, 1984), the creation of turtle reserves at Pearl and Fregate islands in the St Brandon Shoal

(MAFNR, 1985) and the designation of Ile du Nord, Ile Paul, Ile Poulailleur, Ile Puit à Eau, Petit Capitaine and Grande Capitaine as bird sanctuaries (Staub and Gueho, 1968). In addition to the creation of marine protected areas, it has been suggested that a coastal zone management plan be developed to deal with the mounting pressure on coastal wildlife (Stuart and Adams, 1990). To alleviate the problem of overfishing, reserved fishing areas were established in 1983. Lagoonal fisheries have been particularly affected, however, leading the government to consider delineating important shallow areas of the lagoons, especially in reserved fishing areas, where all forms of fishing will be prohibited (MAFNR, 1985). Currently, marine resources are being studied by the University of Mauritius under its Mauritius 2000 Programme (Manrakhan, 1983) and a second project, supported by Unesco, to map the reefs, lagoons and coastal systems is being conducted in order to assess the status of reefs (Fagoonee, pers. comm., 1986).

Efforts to conserve forests dates back to the late 1800s with the establishment of the current mountain and river reserves to protect watersheds (Cheke, 1987a). Following the Ancient Monuments and National Reserves Ordinance, 1944, the first nature reserves were established from 1951 in a number of different vegetation types (Cheke, 1987a, 1987b). The establishment of these reserves was based on strong botanical considerations and did not necessarily reflect the distribution of non-floral species (Proctor and Salm, 1975). These reserves were extended in the 1970s, the most significant being the linkage of Macchabee and Bel Ombre to create a new nature reserve of 3,611ha. The remaining nature reserves were constituted in the early 1980s. In total, protected areas comprising nature reserves (4,665ha) and privately-owned mountain (3,800ha) and river (2,740ha) reserves, cover about 6.0% of the total area. There is also an unspecified amount of national forest, the boundaries of which are not well defined (Forestry Service, 1990; Owadally, pers. comm., 1990).

Certain recommendations for action have been outlined in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams, 1990). Two recommendations of note are an intensified management effort in Macchabee/Bel Ombre Nature Reserve to prevent further habitat degradation, and protective measures for certain woodland sites on Rodrigues and Agalega. The Four-year Plan for Social and Economic Development 1971-75 contains an outline proposal for the establishment of one national park in the Mare aux Vacoas-Black River Gorges area (Government of Mauritius, 1971). With assistance from the World Bank, it is anticipated that Black River National Park will be created in the near future (Owadally, pers. comm., 1991). This national park would protect an important reservoir of lowland wet evergreen forest. Proposals to increase the number of nature reserves to protect remnants of native vegetation and the development of management

plans for nature reserves and potential national parks have also been put forward (MAFNR, 1985; Proctor and Salm, 1975). The restoration of Round Island to save its flora and fauna is of priority to the government, as outlined in its 1985 White Paper (MAFNR, 1985). A ten-year management plan for the island was drawn up in 1989, focusing on the restoration of the island's flora and fauna (Forestry Service, 1990; Bullock, pers. comm., 1991). The planting of native species once found on the island has since begun (WWF, 1989).

In 1984, a "Wildlife Research and Conservation Programme" was drawn up by the government, the International Council for Bird Preservation (ICBP) and the Jersey Wildlife Preservation Trust. One of the aims of the first phase (1984/85) was habitat improvement (UNEP/IUCN, 1988). IUCN and WWF are currently helping to preserve the flora of Mauritius through the creation of special reserves where exotic plants are removed and areas fenced to keep out pigs and deer (WWF, 1989). The goal of these reserves, although small in size, is to provide for the protection of every native plant in at least one reserve. It is hoped that this project can be expanded in future. The Royal Society of Arts and Sciences of Mauritius is managing and protecting Modrain Nature Reserve, which represents one of the last examples of ridge-type, mid-altitude vegetation (WWF, 1989). A major European Development Fund project has been instrumental in helping to create a 35ha nature reserve on Grande Montagne on the island of Rodrigues (WWF, 1989).

Threats to the integrity of the protected areas system include: degradation of habitat and displacement of native flora and fauna by such exotic animals as rabbits, goats, pigs, deer, monkeys, rats and giant snails, and by such exotic plants as strawberry guava *Psidium cattleianum* and privet *Ligustrum robustum* (Owadally, 1980; Round Island Expedition Report, 1982); high population growth and density with an ever-increasing demand for fuel wood (Proctor and Salm, 1975); and uncontrolled bush fires in the north and west, particularly within plantations (Forestry Department, 1988). Rodrigues has been under pressure from cattle encroachment and slash and burn agriculture (Gade, 1985; MAFNR, 1985; WWF, 1989). Goats and rabbits have been eradicated from Round Island within the past decade (Bullock, pers. comm., 1991).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: National Monuments Act No. 9

Date: 1 June 1985

Brief description: Provides for the creation of nature reserves and the establishment of the National Monuments Board.

Administrative authority: National Monuments Board

Designations:

Nature reserve Any forest, park, garden, or other open space which is to be preserved for aesthetic, geological, historical, archaeological or scientific interest.

A list of monuments and natural areas proposed by the Board is published in the *Gazette*.

Prohibited activities within ancient monuments and nature reserves include any work of demolition, removal, repair, alteration or additions without approval of the site's guardian.

Private nature reserves are to be maintained by the owner.

Source: Original legislation

Title: Forests and Reserves Act No. 41

Date: 11 November 1983, last amended 1986

Brief description: Amends and consolidates laws relating to forests and reserves.

Administrative authority: Forestry Service (Chief Conservator of Forests), Ministry of Agriculture, Fisheries and Natural Resources

Designations:

Reserve An area taken to mean Crown land, mountain, river, road or nature reserve

Prohibited activities include the introduction of any article injurious to plant life, the possession of firearms, the grazing of animals, the removal or destruction of forest products, littering, and the introduction of any plant or animal species, without the written authority of the authorised officer.

Under the amendment of 1986, the definition of "protected plant" is limited to those on Crown lands and reserves only.

Nature reserve New areas must first be approved by the Nature Reserves Board, then submitted for government approval.

Prohibited activities and management as outlined in the National Monuments Act.

The lighting of fires in such areas is prohibited without the written consent of the authorised officer.

Mountain reserve That land lying between the ridge line and the mountain reserve line on either side of a mountain range.

Plans for their creation are published in the *Gazette*.

The authorised officer may authorise the owner or occupier to remove dead or live trees in order to improve growing stock, or direct that reserve areas be planted or replanted in a manner which he sees fit.

Prohibited activities include the planting of trees, cultivation of crops or the building of any structure without written consent.

River reserve That area extending from the edge of a watercourse to the top of an escarpment, or where there is no escarpment, the land extending 16m away from a river, 8m from a rivulet and 3m from a feeder.

The authorised officer may authorise the owner or occupier to remove trees for the building of bridges or roads, for providing access to a stream, or for replanting the land.

Prohibited activities include the planting of trees, cultivation of crops or the building of any structure without written consent.

Road reserve That land on each side of a road which forms part of the *domaine publique*.

Prohibited activities include the destruction of trees without written authorisation – authorised officer may plant a row of trees along each side of the road reserve with consent of the owner.

National forest The Minister may declare any Crown land which is forest to be a national forest.

Such areas are not devoted to any use other than as forest land.

Unsurveyed forest Prohibited activities include the destruction of trees on forested land which is belonging to or claimed by the Crown, in possession or claimed by the Curator, or adjacent to a mountain reserve.

Source: Original legislation

Title: Maritime Zones Act

Date: 1 August 1977

Brief description: Allows for the creation of historic waters and designated areas.

Administrative authority: Fisheries Division (Director), Ministry of Agriculture, Fisheries and Natural Resources

Designations:

Designated area The Prime Minister may declare any area of the continental shelf or the exclusive economic zone to be a designated area.

Provision may be made by the Prime Minister with respect to exploration, exploitation, and protection of resources, the conduct of scientific research, the protection of the marine environment, and the passage of ships in designated areas.

Historic water Areas which may be designated and protected by the Minister by notice published in the *Gazette*.

Source: Original legislation

Title: Fisheries Act

Date: 24 May 1980

Brief description: Allows for the creation of reserved areas and management of the fisheries resource.

Administrative authority: Fisheries Division (Director), Ministry of Agriculture, Fisheries and Natural Resources

Designations:

Reserved area An area of the sea prescribed by the Minister, where fishing with a large net, gill net or canard net is prohibited.

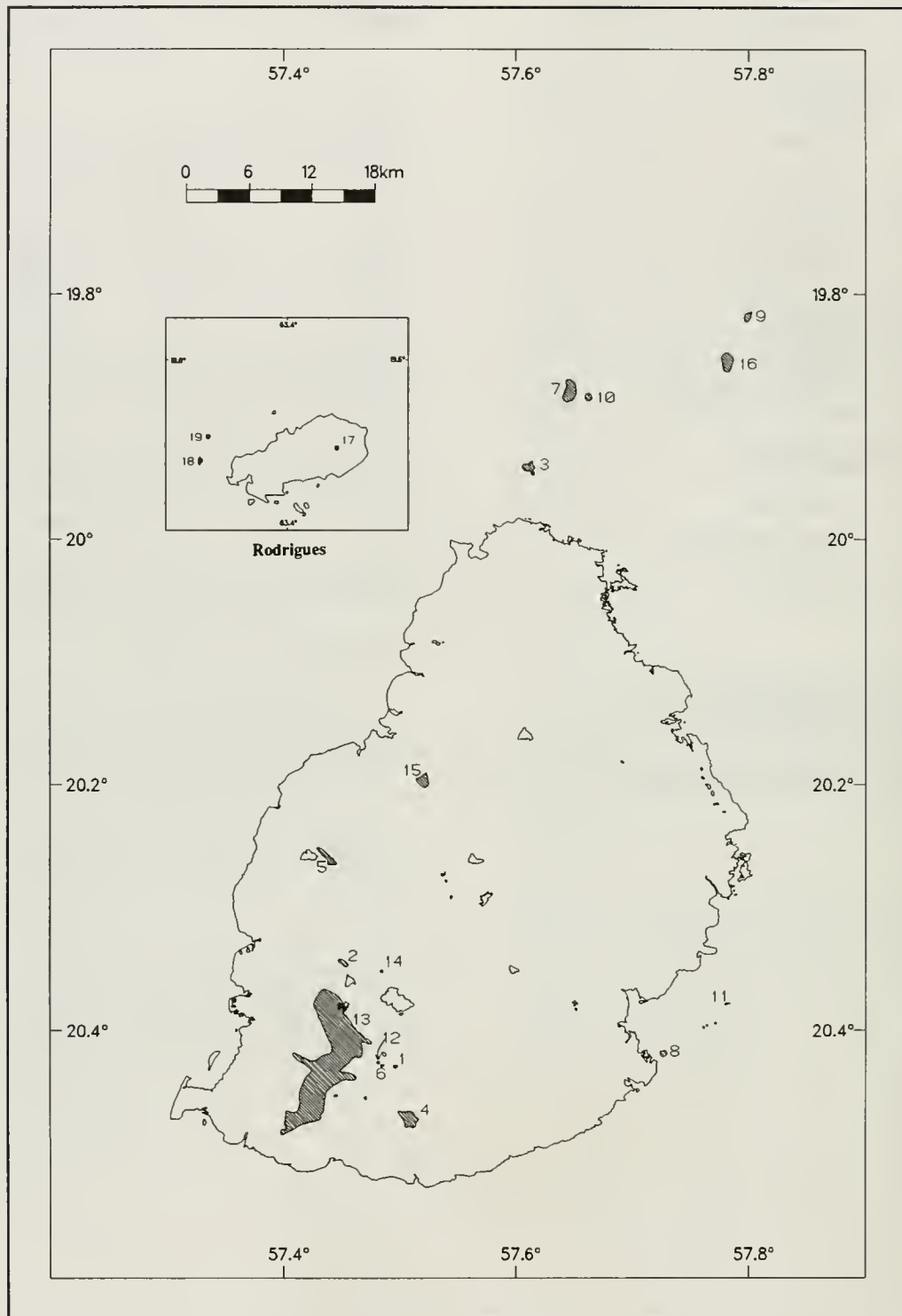
Other prohibited activities include luring fish out of reserved areas for catching.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>Nature Reserves</i>			
1	Bois Sec	IV	6	
2	Cabinet	IV	18	
3	Coin de Mire (Gunner's Quoin)	IV	76	1970
4	Combo	IV	207	
5	Corps de Garde	IV	90	
6	Gouly Pere	IV	11	
7	Ile Plate	IV	253	1972
8	Ile aux Aigrettes	IV	25	1965
9	Ile aux Serpents	IV	31	1983
10	Ilot Gabriel	IV	42	1972
11	Ilot Marianne	IV	2	1972
12	Les Mares	IV	5	
13	Macchabee-Bel Ombre	I	3,611	1951
14	Perrier	IV	2	
15	Pouce	IV	69	
16	Round Island	I	159	1957
	RODRIGUES			
17	Grande Montague	IV	35	
18	Ile aux Cocos	IV	15	1981
19	Ile aux Sables	IV	8	1981
	<i>Biosphere Reserve</i>			
	Macchabee/Bel Ombre Nature Reserve	IX	3,594	1977

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Mauritius

MAYOTTE

Area 373 sq. km (Paxton., 1990)

Population 67,138 (1985) (Anon., 1990)

Natural increase: No information

Economic Indicators

GDP: No information

GNP: No information

Policy and Legislation Mayotte was a French colony from 1843 until 1914 when it was attached, with the other Comoro Islands, to the Government-General of Madagascar. The Comoro Group was granted administrative autonomy within the French Republic and became an Overseas Territory. When the other three islands voted to become independent in 1974, Mayotte voted against this and, became a French dependency. Mayotte is thus nowadays subject to French legislation, details of which are given in the country sheet for France (Paxton, 1990).

International Activities See country sheet for France.

Administration and Management The Fisheries Service (Service de Pêches) was established in 1988. Following recommendations from the Centre Océanologique de Marseille, the Fisheries Service has developed a policy to protect the seas. The objective is to create a series of protected spots around the island (Anon., 1991).

Systems Reviews Mayotte, east of the Comoro Islands, consists of a main island of volcanic origin of 362 sq. km and a smaller island, Pamanzi (11 sq. km) lying 2km to the east. Mayotte is of volcanic origin and is almost entirely surrounded by a barrier reef. The reef lies 3-15km offshore, sheltering a deep lagoon, which generally slopes towards the island, the shallower parts

lying near the barrier reef. The reef is one of the few barrier reefs, and the least developed, in the Indian Ocean (UNEP/IUCN, 1988). The lagoon is one of the best preserved lagoons in the Indian Ocean. There is little pollution from hydrocarbons, but domestic refuse is habitually thrown in the lagoon, and soil erosion is leading to eutrophication of the water (Anon., 1991).

The main food crops are mangoes, bananas, breadfruit, cassava and pineapples. Chief cash crops are ylang-ylang, vanilla, coffee, copra, cinnamon and cloves. Fish form an important part of the islanders diet (Paxton, 1990; Anon., 1991).

The first two protected areas were established in 1991: a marine reserve in the Longogori Pass and a marine and terrestrial reserve in the south-east of the island, over the Saziley Gap, Parc naturel de Saziley. A third zone is planned on the north of the island (Anon., 1991; B.A. Thomassin, pers. comm., 1991).

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PEOPLE'S REPUBLIC OF MOZAMBIQUE

Area 799,380 sq. km

Population 15,656,000 (1990)

Natural increase: 2.7% per annum

Economic Indicators

GDP: US\$ 76 per capita (1987)

GNP: US\$ 100 per capita (1988)

Policy and Legislation Parks and reserves are gazetted under Decree No. 40040 of 20/1/1955. Protected areas fall into six categories: national park; game reserve; partial reserve; faunal reserve and hunting and photographic safari area (coutadas) and forest reserves (see Annex) (IUCN, 1987b; Tinley *et al.*, 1976). Statutory Instrument No. 7/78 of 18 April 1978 regulates hunting, and provides for the establishment of conservation areas in which hunting is not allowed (IUCN, 1986).

The country is heavily dependent upon coastal resources, but as yet has no comprehensive coastal resources policy (Forjaz, 1985).

Decree No. 13/81 of 25 July 1981 provides for the creation of the Empresa Moçambicana de Fauna (IUCN, 1986).

International Activities At an international level, Mozambique is signatory to the Convention on World Cultural and Natural Heritage (World Heritage Convention) since 1982, but no sites have been inscribed on the World Heritage List. It is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), nor does it participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Mozambique is signatory to the African Convention of Nature and Natural Resources 1968 (African Convention), which provides definitions of national parks, strict nature reserves and special reserves.

The Mozambican and South African governments are discussing the creation of a huge conservation area in central Mozambique, the Kruger/Limpopo International Park. This would link the Limpopo Wildlife Utilization Unit (including Banhine National Park) in Mozambique, with existing game reserves in neighbouring countries: Kruger National Park in South Africa; Gonarezhou in Zimbabwe, and reserves in Swaziland and in South Africa's Natal province to the south. The whole complex, if implemented, would comprise the biggest national park in the world (Ministerio de Agricultura, 1991).

Administration and Management The prime governmental agency responsible for environmental matters is the Ministry of Mineral Resources; the Ministry of Construction and Water is the deputy focal

point. The responsibility of coordinating environmental administrative action between the different bodies connected with natural resource use, falls to the National Institute of Physical Planning (INPF), a section of the Ministry of Planning. The INPF has four departments: regional planning, urban planning, housing, and training.

The National Directorate for Forestry and Wildlife (Unidade de Direcção de Fauna Bravia) within the Ministry of Agriculture is responsible for wildlife and forestry matters. Forest reserves come under the jurisdiction of the Forest Department (Unidade de Direcção Florestas) within the National Directorate (Stuart *et al.*, 1990). In 1986, the wildlife sector employed five game wardens, four senior game rangers, 51 game rangers, 67 senior game guards and 127 game guards (Tello, 1986).

In 1981 a parastatal known as Emofauna E.E. (the State Wildlife Corporation) was created by Statutory Instrument No. 13/81 under the control of the then Department of Wildlife and Forestry, with the objective of ensuring the full economic use of natural resources by means of wildlife cropping, marketing, safaris and ecological studies. Several areas have been set aside as wildlife utilisation and production areas under its control (IUCN, 1987b).

As part of the Bazaruto Archipelago project, an integrated management plan has been planned for the area. The project receives assistance from the Endangered Wildlife Trust. Training and financing of Mozambican park staff (including anti-poaching personnel) has been undertaken in collaboration with South Africa. Eduardo Mondlane University (Maputo) manages the partially-protected Inhaca Island (UNEP/IUCN, 1988). Coral reef protection is under the control of the Instituto Investigação Científico de Moçambique, and various port captains (UNEP/IUCN, 1988).

No "protected area" in Mozambique currently has any protection (Ministerio de Agricultura, 1991). The protracted guerilla war has had a severe effect on the management of protected areas. No wildlife areas have had any permanent field staff for several years, and in general the wildlife and forestry departments have been struggling for years with extreme shortages of equipment and staff. A wildlife school in Maputo Game Reserve was closed down in 1985 due to this situation ((Ministerio de Agricultura, 1991; Tello, 1986). Gorongosa National Park was put onto the IUCN list of threatened protected areas in 1984, and Banhine and Zinave national parks in 1985.

A coastal zone management project, in collaboration with IUCN and NORAD, has been approved in principle (Stuart *et al.*, 1990). The National Water Directorate (NWD) in the Ministry of Construction and Water is

connected with the Zambezi River Basin Action Plan, developed in collaboration with UNEP (IUCN, 1987).

The World Bank, interested in the commercial possibilities of the proposed Kruger/Limpopo International Park, is considering a US\$ 12 million loan to Mozambique to get the scheme started (Caplan, 1991).

It is believed that negotiations are in progress between the Direcção Nacional de Florestas e Fauna Bravia and the South African non-governmental organisations, Endangered Wildlife Trust and World Wide Fund for Nature/South Africa (WWF/SA) for the possible privatisation of the management of Mozambique's wildlife resources (Ministerio de Agricultura, 1991).

Systems Reviews Mozambique is relatively low-lying. The north of the country is mountainous, reaching its highest point of 2,419m at Mt Namuli on the eastern edge of the East African Rift Valley. The centre of the country is dominated by the lower Zambezi Valley and delta, and the mountainous western rim of the Rift Valley, here reaching 2,095m at Mt Domue. The south is low-lying and undulating, more than 85% lying below 200m (Hughes and Hughes, 1991).

The biogeographical affinities of the country are predominantly Zambezian, with a broad band of Zanzibar-Inhambane regional mosaic along the coast and in larger river valleys in the north. A limited area of Tongaland-Pondoland regional mosaic occurs in the extreme south, and very limited areas of Afromontane elements on higher ground, especially in the west. The vegetation is predominantly dry miombo woodland, wetter in the north, with large areas of modani and acacia savanna and alluvion grassland in the southern two-thirds of the country. The coastal woodland and thicket mosaic is fairly dry. Montane forest and grasslands occur in the west along the border with Zimbabwe (Davis *et al.*, 1986; Forjaz, 1985; Ministerio de Agricultura, 1991; Stuart *et al.*, 1990).

Approximately 20 million ha (19%) of total land area is under indigenous forest cover; the deforestation rate of closed broad-leaved forest in the country was estimated at 100 sq. km/annum out of a total of 9,350 sq. km (Davis *et al.*, 1986). Forestry plays a minor role in the economy; plantation forests (mostly pine and eucalyptus) covered about 38,964ha in 1987 (Hofstad, 1989).

Important wetlands occur primarily on the coastal plain, consisting of riverine floodplains, seasonal pans and abundant mangroves, the latter covering about 500,000ha. There are about 400 coastal lagoons, over 1,000 lakes and numerous artificial impoundments. Coral reefs are common along the coastline, especially in the north, and are protected around Inhaca Island and the Bazaruto Archipelago in the south. All major rivers flow from west to east, most of which rise in other countries. Mangroves are also found along much of the coastline (Forjaz, 1985; Hughes and Hughes, 1991; Ministerio de Agricultura, 1991; UNEP/IUCN, 1988).

Conservation areas comprising national parks, faunal reserves, game reserves and wildlife utilisation areas cover 6,979,000ha, or about 8.7% of the total land area. There are 14 forest reserves, covering over 4,200ha. The total area of the protected areas network, including proposed areas, is in excess of 8,483,200ha. About 51% of the total protected coastal areas of East Africa occur in Mozambique (UNEP/IUCN, 1988).

Priorities to the protected area network have recently been identified in a report by the Ministerio de Agricultura (1991), cessation of the current civic strife being of obvious primary importance. Following this, proposals include details concerning the development and expansion of reserve areas and re-establishment of the Direcção Nacional de Florestas e Fauna Brevia.

Recommendations given in earlier reports include: improved protection for existing reserves; the establishment of protected areas in highland and coastal forests, particularly in the areas of Mt Namuli, Mt Chipirone, the Njesi Plateau, Mt Gorongosa, the Vumba Highlands and the Chimanimani Mountains; the extension of Gorongosa National Park to include Mt Gorongosa; the extension of Niassa Game Reserve to include the important Lugenda Valley; the establishment of marine reserves at Quirimba Island, Primeira, Segundo and Nacala-Mossuril to protect coral reefs, seabird colonies, seagrass beds and turtle-nesting beaches; and the creation of a protected area in the Mozambique section of Lake Malawi (IUCN, 1987a; MacKinnon and MacKinnon, 1986; Stuart *et al.*, 1990). It has been recommended that illegal human settlement in Maputo Game Reserve should be moved (IUCN, 1987a; Stuart *et al.*, 1990).

There are a number of threats to the protected areas network. Despite negotiations for peace which began in 1991, Mozambique continues to suffer from the many effects of over two decades of intermittent civil war. The consequences of almost 26 years of civil unrest have been catastrophic for the people, the once abundant natural resources and the once world famous national parks. All areas containing national parks and protected areas have been destabilised by the war. With the breakdown of law and order in rural areas, conservation and protection activities have collapsed and poaching for subsistence and profit is rife. Army units, guerilla bands, the People's militia and bandit groups all hunt wildlife to feed themselves and to sell the meat, hides and ivory through a network of corrupt officials in the towns (Ministerio de Agricultura, 1991). Drought and commercial poaching have also taken their toll of wildlife populations, and many large conservation areas are being encroached by settlement (IUCN, 1987b).

Addresses

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(Director), Ministerio de Agricultura, CP 1406,
Praça dos Heróis Moçambicanos, MAPUTO

Emofauna E.E., Departamento de Floresta e Fauna, Ministério da Agricultura, CP 2706, MAPUTO
 Marine Biological Station (Director), Inhaca Island, Centro de Ecologia, Faculdade de Biología, CP 257, MAPUTO
 Unidade de Direcção da Fauna Bravia (Director), CP 1072, MAPUTO

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their legislation

Title: Decree No. 40040

Date: 20 January 1955

Brief Description: Provides for the establishment of six categories of protected conservation area

Administrative Authority: National Directorate for Forestry and Wildlife (Director)

Designations:

Parque nacionais (National park) Managed for ecological, cultural, aesthetic and socio-economic objectives.

Reserva especiais (Game reserve) Similar to national parks, excluding the socio-economic objectives.

Reserva parciais (Partial reserve)

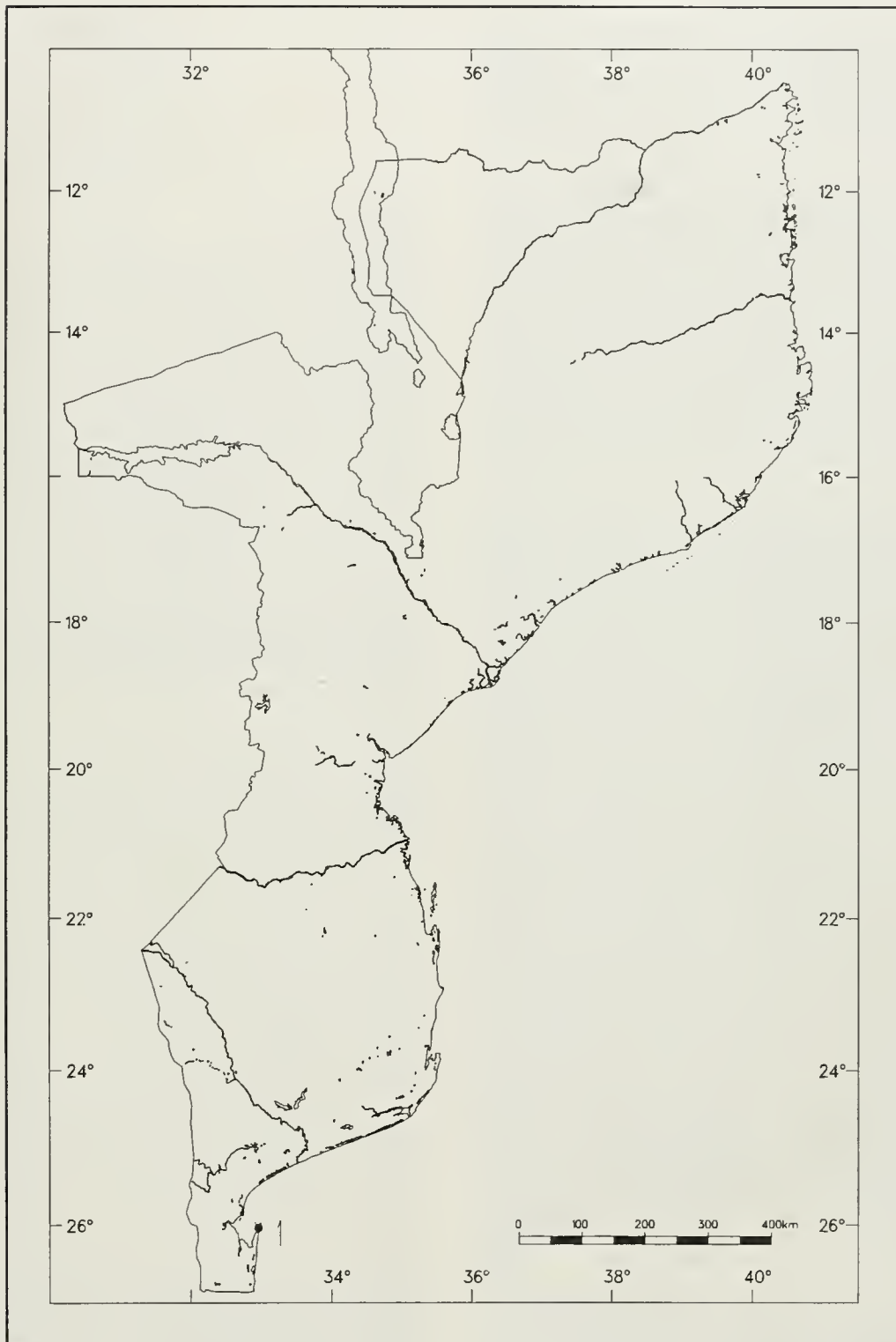
Regimen de vigilancia (Faunal reserve) Have one or more species protected, although others may be excluded.

Coutada (Hunting/photographic safari area) Concession areas in which commercial safaris of various kinds may be undertaken by the leaseholder.

Reserva florestais (Forest reserve) Areas intended to protect representative examples of vegetation-types.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	<i>Faunal Reserve</i> Ilhas da Inhaca e dos Portugeses	IV	2,000	1965



Protected Area of Mozambique

NAMIBIA

Area 824,290 sq. km

Population 1,781,000 (1990)

Natural increase: 3.1% per annum

Economic Indicators

GDP: US\$ 1,002 per capita (1987)

GNP: No information

Policy and Legislation Principles of state policy, as outlined in the national constitution adopted at independence (1989), include the "maintenance of ecosystems, essential ecological processes and biological diversity and utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future ...". Duties of the Ombudsman include the investigation of complaints concerning the over-utilisation of natural resources, the degradation and destruction of ecosystems, and failure to protect the beauty and character of the country. Complimenting these aspects of the constitution are the following philosophical principles which have been adopted for the practice of nature conservation: conservation is a human activity performed for the benefit of humanity; conservation comprises a number of management options, ranging from total protection to intensive multiple use of natural systems and resources; and, conservation includes the protection of products of civilization of cultural value (van der Walt, pers. comm., 1989).

Parks and reserves are declared under the Nature Conservation Ordinance No. 4, 1975, as amended in 1987. Definitions used include national park, game park, national recreation area, nature reserve and recreation resort (see Annex). Private nature reserves may be proclaimed on privately-owned land (Berry, 1990).

National monuments, including natural sites, may be declared under the National Monuments Act, 1969, amended to 1979 (see Annex). This Act establishes the National Monuments Council and specifies its powers, functions and duties. It also specifies prohibited activities and accompanying penalties in connection with national monuments. This Act repeals a number of earlier acts, ordinances and proclamations dealing with natural and historical monuments, relics and antiques, dating from 1934. Although this Act is South African by origin, it has remained in force in the country by virtue of Clause 140 of the Constitution of the Republic of Namibia (Bruwer, pers. comm., 1991).

As a result of the growth in tourist numbers over the past decade, a national tourism strategy has been developed to identify needs and to coordinate further development. An integral part of this strategy is utilisation of Caprivi Nature Park, for which a management plan is being initiated (Stuart and Adams, 1990; van der Walt, pers. comm., 1988). Further, developing a national policy on

environmental impact assessments (EIAs) is one objective of the Ministry of Wildlife, Conservation and Tourism (Grobler, 1991). As the country develops, legislation will need to be enforced to protect national parks and nature reserves from encroachment and from the side-effects of resettlement (Bass and Lungu, 1985).

International Activities Namibia is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Namibia is not party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), but is a member of the Subcommittee of Forestry, Fisheries, and Wildlife of SADCC.

Administration and Management In 1969, state-owned protected areas were placed under the jurisdiction of the Directorate of Nature Conservation and Recreation Resorts, Department of Agriculture and Nature Conservation. In 1980, this Directorate was made responsible for all conservation activities in the country (van der Walt, pers. comm., 1989). Following independence, the Ministry of Wildlife, Conservation and Tourism was formed. The aims of this ministry, which follow the objectives of the World Conservation Strategy are: to maintain and rehabilitate essential ecological processes and life support systems; to conserve biological diversity; and to ensure the sustainable utilisation of resources. This ministry is responsible for all conservation activities in the country; for wildlife on state-owned land; for the administration of national parks, game reserves and other protected areas; for all aspects of tourism, including the registration of private game ranches and hunting farms; and for liaising with other ministries regarding controlling the impact of various economic activities on the environment (Grobler, 1991). For the purposes of management, conservation areas under the jurisdiction of the Ministry are divided into two main categories, game reserves and/or nature reserves; and recreation reserves. The former category is further zoned into four areas, namely, special protected area, wilderness areas, natural areas and development areas (Grobler, 1991). Currently, there are a total of 1800 people working in the wildlife service and in 1990, there was a budget of R 11 million for wildlife conservation (Grobler, pers. comm., 1991).

The Directorate of Wildlife, Conservation and Research, within the Ministry of Wildlife, Conservation and Tourism, is headed by a Director who is supported by a Head of Research and a Head of Management. Chief researchers are found in Windhoek, Etosha and Namib.

This Directorate has a Planning Section which is responsible for strategic planning for environmental conservation, the setting of conservation priorities in terms of the National Policy, and the co-ordination of land-use and management plans, among others (Grobler, 1991). Achievements of the Directorate over the past decade have included game censuses, the development of local participation programmes in conservation, and wetlands monitoring. The Directorate of Tourism and Resorts, also within the Ministry of Wildlife, Conservation and Tourism, is responsible for the maintenance and development of resorts and tourist facilities, and is assisting in the development of a tourism strategy for the SADCC region (Grobler, 1991).

Falling under the Ministry of Agriculture, Fisheries, Water and Rural Development are the Directorates of Agriculture, Inland and Sea Fisheries, Veterinary Services, Forestry, Water Affairs, and Rural Development (Stuart and Adams, 1990). National monuments fall under the jurisdiction of the National Monuments Council, a corporate body within the Ministry of Education and Culture (Bruwer, pers. comm., 1991). It is the responsibility of the Council to preserve and protect the historical and cultural heritage, to promote the preservation and protection of that heritage, and to coordinate all activities in connection with monuments. The Council consists of not less than seven members appointed by the Minister.

Technical training in wildlife management is conducted at Technicon Namibia in conjunction with the Ministry of Wildlife, Conservation and Tourism. The Desert Ecological Research Unit of Namibia (DERUN), a private foundation established in 1966, runs a programme of desert research and education (DERUN, 1990).

Systems Reviews Namibia is located in the south-western part of Africa and is bordered by Angola, Zambia, Zimbabwe, Botswana and South Africa. To the west, it has a coastline of more than 1,400km (Hughes and Hughes, 1991). The main geographic regions are: the 80-140km wide coastal Namib desert; the central plateau, characterised by mountains of up to 2,585m (Brandberg); the Kalahari Desert Basin, which has an elevation between 1,000m and 1,500m and which dominates northern and eastern Namibia; and the eastern Caprivi spur (FAO, 1981; Mitarbeiter and Skrywers, 1974). Land-use classes comprise cultivated land (1%), pasture (64%), forest/woodland (22%), and land used for other purposes (Stuart and Adams, 1990).

The aridity of the country is such that 22% is extremely arid, receiving less than 100mm precipitation per annum; 33% is arid, receiving between 100mm and 300mm per annum; 37% is semi-arid, with 300-500mm per annum; and 8% is subhumid, with more than 500mm per annum (van der Walt, pers. comm., 1989). This range is reflected in the vegetation zones which comprise a desert biome in the south, savanna biome in the central regions, and a woodland biome comprised of forest savanna and

woodland in the moister north (Stuart and Adams, 1990; van der Merwe, 1983). Biogeographic affinities are Zambezi in the north and north-east, and Karoo-Namib in a belt from the south to the northwest. Between these two is the Kalahari-Highveld transition zone (Stuart and Adams, 1990).

The only perennial rivers are the Orange River on the southern border, and the Kwando, Cunene, Kavango, Linyanti/Chobe and Zambezi rivers on the northern borders (Hughes and Hughes, in press; Stander, pers. comm., 1991). Wetlands are associated with the perennial rivers of the north; seasonal pans, such as that found at Etosha; coastal wetlands in sheltered bays on the Namib coast, freshwater lakes in the dunes of the Namib desert, and a number of artificial impoundments (Hughes and Hughes, in press). Caprivi Game Reserve protects wetlands in the western Caprivi, while the proclamation of Mudumu and Mamili national parks in 1990 has afforded a degree of protection to wetlands of the eastern Caprivi (CNPPA, 1990; Grobler, 1991). Natural lakes such as Lake Otjikoto are currently unprotected and an identified priority is for wetland assessment and monitoring (Hughes and Hughes, 1991; Stuart and Adams, 1990). The establishment of a conservation area in Bushmanland (rain water pans wetland system) is currently being considered (Grobler, 1991).

The establishment of game reserves dates from 1907, with the establishment of three game reserves, one of which being Etosha (Bass and Lungu, 1985). Up until 1963, however, only two conservation areas were in existence, Etosha National Park and Namib Desert Park. Consequently, one of the early aims of the Directorate of Nature Conservation was the diversification of game reserves to include the various biotic regions throughout the country. Subsequently, the majority of modern reserves were proclaimed, with important additions being made during the late 1980s and early 1990s. Currently, there are 21 publicly-owned conservation areas, comprising about 13.5% of total land area (Grobler, 1991). These areas cover 11 of the 14 major vegetation zones recognised by Geis (1971). The three vegetation zones not currently protected are mountain savanna and Karstveld around Otavi and Tsumeb, Camelthorn savanna in the central Kalahari, and mixed tree and shrub savanna of the southern Kalahari (Grobler, 1991). As of 1990, there were 359 farms, with a total area of 46,000 sq. km, which were registered as private hunting and quest farms for the purpose of commercial wildlife utilization (Berry, 1990; Grobler, pers. comm., 1991).

Certain priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990), and most recently the Ministry of Wildlife, Conservation and Tourism has set out a number of aims and objectives for the next decade (Grobler, 1991). These include: developing and maintaining a network of conservation areas which will contain at least 10% of each habitat type

in the country; updating park conservation strategies and management practices; proclaiming marine reserves; expanding (Etosha) and unifying conservation areas (Mahango and West Caprivi; Etosha-Skeleton Coast corridor), and establishing buffer zones along park borders to encourage free movement of game; proposing cross-border conservation relations with Angola (Iona National Park); acquiring core conservation areas; and proclaiming national heritage sites at Spitzkoppe, Brandberg, Twyfelfontein and the Petrified Forest (Bass and Lungu, 1985; Grobler, 1991; Stuart and Adams, 1990). Further, the development of master plans and management policies for each conservation area are currently being undertaken (Grobler, 1991).

Colonial governments paid little attention to forests and forestry, including research and training activities. The Nationhood Programme for an Independent Namibia, prepared by the United Nations Institute for Namibia in Lusaka, has however, emphasised the environmental and economic role of forests: "The future development of forestry must be based on environmental planning principles with emphasis on coordination with development efforts in population resettlement and agricultural development, and wildlife conservation. A community-based approach integrating communal and individual woodlot planting with agriculture is more likely to succeed in the peasant areas" (United Nations Institute, 1986). Priority areas with respect to forestry include research and data collection, design of a national afforestation programme with the objective of conservation of forests and the environment, and the training of Namibians in forest management. Following from this programme, the government has recently asked that a baseline study entitled, "Forests and woodlands in the development of Namibia", be conducted. The aims of this study, financed by FINNIDA, are to collect and analyse information concerning forest resources, their utilisation and importance, from which future afforestation and reforestation programmes can be based (Erkkila and Siiskonen, 1990). This baseline study, concentrated on the northern region, is also considering biodiversity aspects in relation to the forest resource (Erkkila and Siiskonen, 1990).

Threats to the forests include shifting cultivation, overgrazing, over-exploitation of fuelwood and uncontrolled bushfires (FAO, 1981). Off-road driving in desert parks is posing a threat to this critical ecosystem, while poaching is becoming an increasing problem in a number of protected areas (DERUN, 1990). Small-scale prospecting and diamond mining, illegal nomadic farming, and boundary fencing which is disturbing migratory patterns among some wildlife species, are other issues of concern. Although the majority of reserves are relatively small in size, they are generally well protected and managed (MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990).

Other Relevant Information A high conservation awareness among the farming community, along with a well-coordinated, multi-faceted game industry

supported by a network of private nature reserves bodes well for future conservation programmes (van der Walt, pers. comm., 1989). Income from hunting, tourism and wildlife products is second only to the mining and fishing industries (Berry, 1990).

Addresses

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Directorate of Forestry (Director), Ministry of Agriculture, Fisheries, Water and Rural Development

National Monuments Council (Director). Ministry of Education and Culture, P/Bag 13335, WINDHOEK (Tel: 061-293456/293463; Fax: 061-293345; Tlx: 3347)

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FINNIDA (Finnish International Development Agency), Mannerheimintie 15 C, SF-00260 HELSINKI

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Nature Conservation Ordinance (Act No. 4)

Date: 1975, last amended 1987

Brief description: An ordinance which provides for wildlife management and the establishment of protected areas

Administrative authority: Directorate of Wildlife Conservation and Research (Director)

Designations:

National park The purposes of such areas are for the propagation, protection, study and conservation therein of wild animal life, wild plant life and objects of geological, ethnological, archaeological, historical and other scientific interest and for the benefit and enjoyment of the inhabitants of the Territory and other persons.

Prohibited activities include the production of wood or the collection of any forest produce.

Game park Game parks, including those which are privately owned, are not maintained for hunting.

National recreation area

Nature reserve

Recreation resort

Sources: FAO, 1981; Grobler, pers. comm., 1991.

Title: National Monuments Act (Act 28)

Date: 1 July 1969, amended 1970, 1971, 1975 and 1979

Brief Description: Allows for the declaration of national monuments and the establishment of the National Monuments Council

Administrative authority: National Monuments Council (Director)

Designations:

National monument These may include buildings, historical sites and unique natural features.

Whenever the Minister considers it to be in the national interest that any property of aesthetic, historical or scientific interest be preserved, protected and maintained, he may, on the recommendation of the Council, declare any such property to be a national monument by notice published in the *Gazette*.

Prohibited activities include destroying, damaging, excavating, altering, removing from its original site or exporting from the Republic any monument except under the authority of a permit issued under this Act.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Etosha	II	2,227,000	1958
2	Mamili	II	32,000	1990
3	Mudumu	II	101,400	1990
	<i>Nature Reserve</i>			
4	Cape Cross Seal	IV	6,000	1967
	<i>Game Parks</i>			
5	Ai-Ais Hot Springs & Fish River Canyon	VIII	346,117	1969
6	Daan Viljoen	IV	3,953	1962
7	Hardap	VIII	25,177	1964
8	Kaudoim	VIII	384,162	1989
9	Mahango	VIII	24,462	1990
10	Namib/Naukluft	II	4,976,800	1979
11	Skeleton Coast	II	1,600,000	1967
12	Von Bach	VIII	4,285	1972
13	Waterberg Plateau	II	40,549	1972
14	Western Caprivi	IV	600,000	1968
	<i>Recreation Areas</i>			
15	National Diamond Coast	V	2,900	1977
16	National West Coast Tourist	V	780,000	1974

Category VIII forest reserves are neither listed nor mapped.



Protected Areas Namibia

NIGER

Area 1,267,000 sq. km

Population 7.9 million (1990)
Natural increase: 3% per annum

Economic Indicators

GDP: US\$ 333 (1987)
GNP: US\$ 310 (1988)

Policy and Legislation Current legislation relating to protection of natural resources has its origins in two decrees promulgated by the French colonial authorities during the era when Niger formed part of the territory known as French West Africa. A decree of 4 July 1935 established the forestry regime in French West Africa, and another decree of 18 November 1947 controlled hunting in French overseas territories (Sanogho, 1983). Niger subsequently became an autonomous republic within the French Community on 18 December 1958 and achieved full independence on 3 August 1960. As in many of the other countries which comprised French West Africa, from the early days of independence, Niger had adequate legislative texts and regulations concerning the protection of fauna and hunting (DFF, 1987).

Law No. 62-28 of 4 August 1962 fixing the hunting regime (*Loi fixant le régime de la chasse*) (Annex) provides regulations concerning activities prohibited within partial and total faunal reserves (*réserves totales et partielles de faune*). The law states that these regulations apply to previously gazetted faunal reserves, and also provides for future reserves to be created by decree, as well as providing general conditions concerning hunting.

Legislation concerning the forests is provided in Law no. 74-7 of 4 March 1974 concerning the forest regime (*fixant le régime forestier*) (see Annex) which provides for classified forests (*forêts classées*), protected forests (*forêts protégées*) and restoration areas (*périmètres de restauration*). Two further pieces of legislation which relate to this law were passed the same year. Decree (*décret*) No. 74-226 PCMS/MER/CAP of 23 August 1974 fixing the conditions of application of Law No. 74-7 of 4 March 1974 fixing the forest regime (*fixant les conditions d'application de la Loi No. 74-7 fixant le régime forestier*) provides for procedures for the classification of land within the forest regime, and provides further details concerning the exercise of customary rights of use as well as modifications to regulations concerning cultivation of soil in classified forests (see Annex). Decree (*Ordonnance*) No. 4/16 of 23 August 1974 modifying and completing Law No. 74-7, fixing the forest regime (*modifiant et complétant la loi fixant le régime forestier*) provides further details of procedures to follow concerning infractions against the forest law.

Decree No. 88-019/PCMS/MAG/E of 22 January 1988 concerning classification of the Aïr and Ténéré National Nature Reserve (*portant classement de la Réserve Naturelle Nationale de l'Aïr et Ténéré*) (see Annex) and Decree No. 88-020/PCMS/MAG/E of 22 January 1988 concerning classification of the "Sanctuaire des Addax" strict nature reserve (*portant classement de la Réserve Naturelle Intégrale dite "Sanctuaire des Addax"*) (see Annex) contain regulations relating to activities permitted within the reserves. Both pieces of legislation stipulate activities which are permitted and prohibited within the reserves.

Decree (*Décret portant organisation du Ministère de l'Agriculture et de l'Environnement*) No. 88-015/PCMS/MAG/E of 22 January 1988 provides for the establishment of the Ministry of Agriculture and the Environment.

International Activities Niger accepted the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 23 December 1974. Aïr and Ténéré National Nature Reserve has been recommended for inscription as a World Heritage site (IUCN, 1991). The country signed, without reservation as to ratification, the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) on 30 April 1987, under which one site has been inscribed. No sites have been designated as biosphere reserves under the Unesco Man and the Biosphere Programme. Niger is a signatory to the 1968 African Convention on the Conservation of Nature and Natural Resources, which provides definitions of strict nature reserves, national parks and special reserves.

The Lake Chad Basin Commission, uniting representatives of four countries bordering the lake, was established in 1964 (Anon., 1990). A proposal to set up a single authority to manage the three contiguous "W" national parks in Burkina Faso, Benin and Niger, totalling over 1 million ha, and to raise funds for its operation, is being considered (Thorsell, 1990).

Administration and Management Administration of protected areas is currently the responsibility of the Department of Wildlife, Fisheries and Fish Farming (*Direction de la Faune, Pêches et Pisciculture*). This department, which belongs within the environment section, formed part of the Ministry of Hydrology and Environment (*Ministère de l'Hydraulique et de l'Environnement*) in April 1990, but from 1988 to March 1990 was within the Ministry of Agriculture and Environment (*Ministère de l'Agriculture et de l'Environnement*). Previously the body responsible for management of protected areas was the Service Aménagement de la faune, within the *Direction des Eaux et Forêts-Chasse-Pêche*.

In practice, in 1987, only 40 people were responsible for guarding and managing wildlife throughout an area of 1,267,000 sq. km (DFF, 1987).

Since 1979, IUCN and WWF have been assisting the government in the development of a natural resource conservation and management programme in the Aïr and Ténéré. In 1987, they were joined by Band Aid and the Swiss development agency DDA in providing financial and technical assistance to ensure the programme's continuation. There is currently one WWF project within the country, project 1624, concerning the conservation and natural resource management of Aïr and Ténéré National Nature Reserve (WWF, 1991). IUCN – The World Conservation Union now has a full time officer in the country.

The emergence of national NGOs is proceeding slowly. A national seminar convened by the Ministry of the Interior in May 1990 laid the basis for the development of local NGOs and village associations (IUCN, 1990).

Despite the establishment from an early date of adequate legislation to protect wildlife and create protected areas, protection has never been effectively enforced. Uncontrolled hunting throughout the country has resulted in devastation of the once prolific fauna. This has culminated in the near extinction from Niger of addax *Addax nasomaculatus*, and lack of sighting in the country since 1983 of scimitar-horned oryx *Oryx dammah* (IUCN, 1991).

Although better managed than the "W" national parks in Burkina Faso and Benin, threats to "W" National Park in Niger include: "subsistence" poaching, illegal grazing (mainly by large herds brought in from outside the park, rather than by animals owned by local villagers), proposed mining of phosphates, bushfires, and deforestation along water courses (DFF, 1986; IUCN, 1984; C. Magin, pers. comm., 1991). Threats to the management of Aïr and Ténéré National Nature Reserve come from: poaching by the military; insensitive tourist disturbance of wildlife (particularly the motorised pursuit of animals to obtain photographs, which can result in their deaths from exhaustion or heat stress) and littering; over grazing and exploitation of firewood (near centres of population); illegal commercial wood collecting; and the failure of reserve authorities to obtain complete political recognition by other governmental departments (IUCN, 1991; C. Magin, pers. comm., 1991). Gadabedji and Dosso total faunal reserves exist only in name, management never having being effective. Tamou is reasonably well managed (DFF, 1987).

A School's Environmental Education Project in the departments of Agadez and Tahoua was started in 1990, which produces a quarterly magazine, distributed to schools, called "Alam" (camel in Tamasheq, the language of the Twareg) (IUCN, 1990).

Systems Reviews Niger is a land-locked country bounded by Nigeria and Benin in the south, Burkina and Mali in the west, Algeria and Libya in the north, and

Chad in the east. The lowest land, below 200m, penetrates the country in the extreme southwest along the valleys of the Niger River and its affluents. Most of southern Niger is a sandy plateau, of 200-500m, with lowlands around Lake Chad in the southeastern corner. The Aïr Mountains, a chain of isolated massifs, reach southwards into the country from Algeria. The interior plateau, 400-700m, is a peneplain, topped in the Aïr region with mainly granitic intrusions (Hughes and Hughes, 1991; C. Magin, pers. comm., 1991).

The country is mostly desert and semi-desert, and comprises three identifiable ecological zones (DFF, 1987). In the north, the Sahara desert zone covers two thirds of the country. South of this, a Sahelian-Saharan zone of wooded grassland and semi-desert grassland covers 25% of the country. In the south, a Sudanian-Sahelian zone of Sudanian woodland with abundant *Isobertinia* covers less than 15%. The northernmost summits of the Aïr Mountains form one of the relatively few massifs sufficiently elevated to support distinct Saharomontane vegetation, this being markedly different from vegetation found at lower altitudes. The only perennial watercourses are the Niger River in the south-western extremity and the Gada River in the south. Some 421,250ha of Lake Chad and its peripheral marshes is situated in Niger, in the south-east corner (IUCN, 1989). The south of the country has largely been turned over to agriculture, millet being the principal crop. Above 15 north, "rain-fed" agriculture is prohibited, although this is often ignored in wet years. Some crops are grown in this area on land irrigated from wells.

The protected areas system currently comprises six reserves, which cover over 6.6% of the country. The system encompasses all vegetation types except swamp, though there is little wooded grassland or Sudanian woodland. "W" National Park was originally established as a "parc de refuge" in 1937. It was classified as a total faunal reserve in 1953, and in 1954 was redefined by decree as a national park. Gadabedji Total Faunal Reserve and Classified Forest, created in 1955 for the conservation of scimitar horned oryx (now extinct in the country) and gazelle, is the only reserve in Niger within the Sahel-Saharan zone. Tamou Total Faunal Reserve was established in 1962, to form a buffer zone for "W" reserve. Dosso Reserve was created at the same time. Aïr and Ténéré National Nature Reserve, and a core zone, Addax Sanctuary Strict Nature Reserve, were established in 1988, covering semi-desert and desert vegetation. Covering 77,360 sq. km, Aïr and Ténéré National Nature Reserve is the largest protected area in Africa under active management, and is thus far the most important in the Sahel zone (IUCN, 1989).

Classified forest reserves, which include classified forest, and defence and restoration areas (périmètres de mise en défense et de restauration), were created between 1937 and 1956. The 66 classified forests cover an area of 205,308ha, and 51 restoration and defence areas cover a further 68,986ha (MERC, n.d.).

The country's first seminar on wildlife management was held in March 1986, to plan safeguards for the area's rapidly vanishing wildlife. The subsequent report outlined the general policy towards wildlife, proposed a strategy for wildlife management, and made a number of specific recommendations concerning the threats to 'W' National Park, and the establishment of Aïr and Ténéré National Nature Reserve. The strategy proposed by the seminar involved: drawing up an inventory of the remaining refuges for wildlife within the country; increasing public awareness and involvement; strengthening of staff and material resources; development and implementation of a wildlife management master plan; a legislative review; and encouraging national and international tourism (MHE, 1986).

Principal recommendations given in a report by the government on the management of fauna and protected areas include increasing general awareness of the value of protected areas in maintaining the ecological equilibrium; creation of new protected areas, with consideration to the needs of local people; increasing the number of trained personnel to manage protected areas; greater support from donors and greater commitment from official authorities to ensure protected areas remain accessible to local people for reasons of culture, education, science and leisure (DFF, 1987).

Despite the fact that all hunting in Niger has been banned, it is widely practised in the absence of law enforcement. Traditional hunting, devoid of modifying factors such as modern weapons, vehicles and changing land-use patterns, probably does not have a significant effect on wildlife numbers. Hunting by the armed forces is of more concern, and considering its widespread nature, is difficult to control. Other management problems include desertification and periodic drought, which exacerbate human/wildlife conflict.

Recommendations for action to improve the management of protected areas and for other conservation measures are also given in MacKinnon and MacKinnon (1986), IUCN (1987) and in IUCN (1989). A report by Newby (1984) focuses on Niger, and refers, in general to the value of protected areas in the Sahel.

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Loi No. 62-28 fixant le régime de la chasse (Law No. 62-28 fixing the hunting regime)

Date: 4 August 1962

Brief description: Provides, amongst other things, for regulations within total and partial faunal reserves, as well as for general hunting regulations, including lists of strictly and partially protected species.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Réserve totale de faune (Total faunal reserve) All hunting is prohibited, other than by permit for reasons of science, hunting or capture.

Includes currently existing faunal reserves.

Réserve partielle de faune (Partial faunal reserve) Created by decree.

Hunting is subject to particular restrictions concerning category of permit, animal species, limits of slaughter, method of hunting and open and closed periods.

Source: Original legislation in French

Title : Loi No. 74-7 fixant le régime forestier (Law fixing the forest regime)

Date: 4 March 1974

Brief description: Provides, amongst other things, for designation of land within the forest regime.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Forêt classée (Classified forest) Constitute the state classified forest, including forests classified prior to the promulgation of the present law, i.e. already subject to a special restrictive regime concerning their exploitation and exercise of customary rights of use.

Includes forests classified by decree made by a council of ministers in conformation with arrangements in the present law.

Areas may not be partially or totally disposed or except following declassification pronounced by decree of council of ministers.

The only customary rights of use permitted are collection of dead wood, exudation products, fruit, medicinal and food plants, and those stipulated in the acts regulating the classification of the site.

Commercial exploitation is permitted by customary collectives of products other than wood, providing this is done in a manner which avoids harming the plants concerned.

Cultivation of forest soil is prohibited.

Limits of classified forests are fixed such that sufficiently wooded areas remain outside them to enable free exercise of customary rights of use to local populations.

Customary rights of use are always subordinate to needs of the state and the forests. In particular, when use of the forest as a thoroughfare (especially by goats and camels) presents a threat, this may be prohibited, without compensation being payable.

Clearance of wood or scrub in a 10m-band along watercourses is prohibited without special authorisation.

Pruning of branches is prohibited.

Forêt protégée (Protected forest) Constitutes the state protected forest.

Includes all state forests which have not been subject to a formal act of classification.

Customary collectives may continue to exercise their customary rights of use, these being limited to personal and collective needs.

Commercial exploitation is permitted by customary collectives of products other than wood, providing this is done in a manner which avoids harming the plants concerned.

Cultivation of forest soil following clearing and incineration may be prohibited.

Clearance of wood or scrub in a 10m-band along watercourses is prohibited without special authorisation.

Trimming, but not pruning of branches is permitted.

Périmètre de restauration (Restoration area)

Areas obligatorily included in this category include non or insufficiently wooded land, comprising: mountain slopes, for which establishment as a reserve is essential; unstable or sandy river banks; land liable to form ravines and dangerous caving in.

Following reforestation, areas may be incorporated in the forest domain by decree of the council of ministers.

Customary rights of use are not permitted.

Cultivation of forest soil is prohibited.

Clearance of wood or scrub in a 10 metre band along watercourses is prohibited without special authorisation.

General conditions concerning lighting of fires throughout the forest domain are given.

Source: Original legislation in French

Title: Décret No. 88-019/PCMS/MAG/E portant classement de la Réserve naturelle nationale de l'Aïr et du Ténéré (Decree concerning classification of the Aïr and Ténéré National Nature Reserve.

Date: 22 January 1988

Brief description: Provides for the gazettelement of Aïr and Ténéré National Nature Reserve, and stipulates activities which are and are not permitted within it.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Aïr and Ténéré National Nature Reserve
Detailed provision is given concerning the exercise of customary rights of use in the reserve, as well as regulations concerning circulation within the reserve.

Source: Original legislation in French

Title : Décret No. 88-020/PCMS/MAG/E portant classement de la Réserve naturelle intégrale dite "Sanctuaire des Addax" (Decree concerning classification of the "Sanctuaire des Addax" Strict Nature Reserve)

Date: 22 January 1988

Brief description: Provides for the gazettelement of Aïr and Ténéré national nature reserve, and stipulates activities which are and are not permitted within it.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Réserve naturelle intégrale dite "Sanctuaire des Addax" ("Sanctuaire des Addax" Strict Nature Reserve) Activities prohibited include: hunting; forest exploitation; agriculture; pastoralism; mining or prospecting; any activity modifying the surface of the land or vegetation; any activity tending to harm or modify the fauna or flora; penetration, circulation or camping or residence; flying at low-altitude.

Declassification or modification of the reserve is done by decree.

Source: Original legislation in French

Title: Décret No. 74-226 PCMS/MER/CAP fixant les conditions d'application de la Loi No. 74-7 fixant le régime forestier (Decree fixing the conditions of application of Law No. 74-7 fixing the forest regime)

Date: 23 August 1974

Brief description: Provides, amongst other things, for activities permitted within classified forests.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

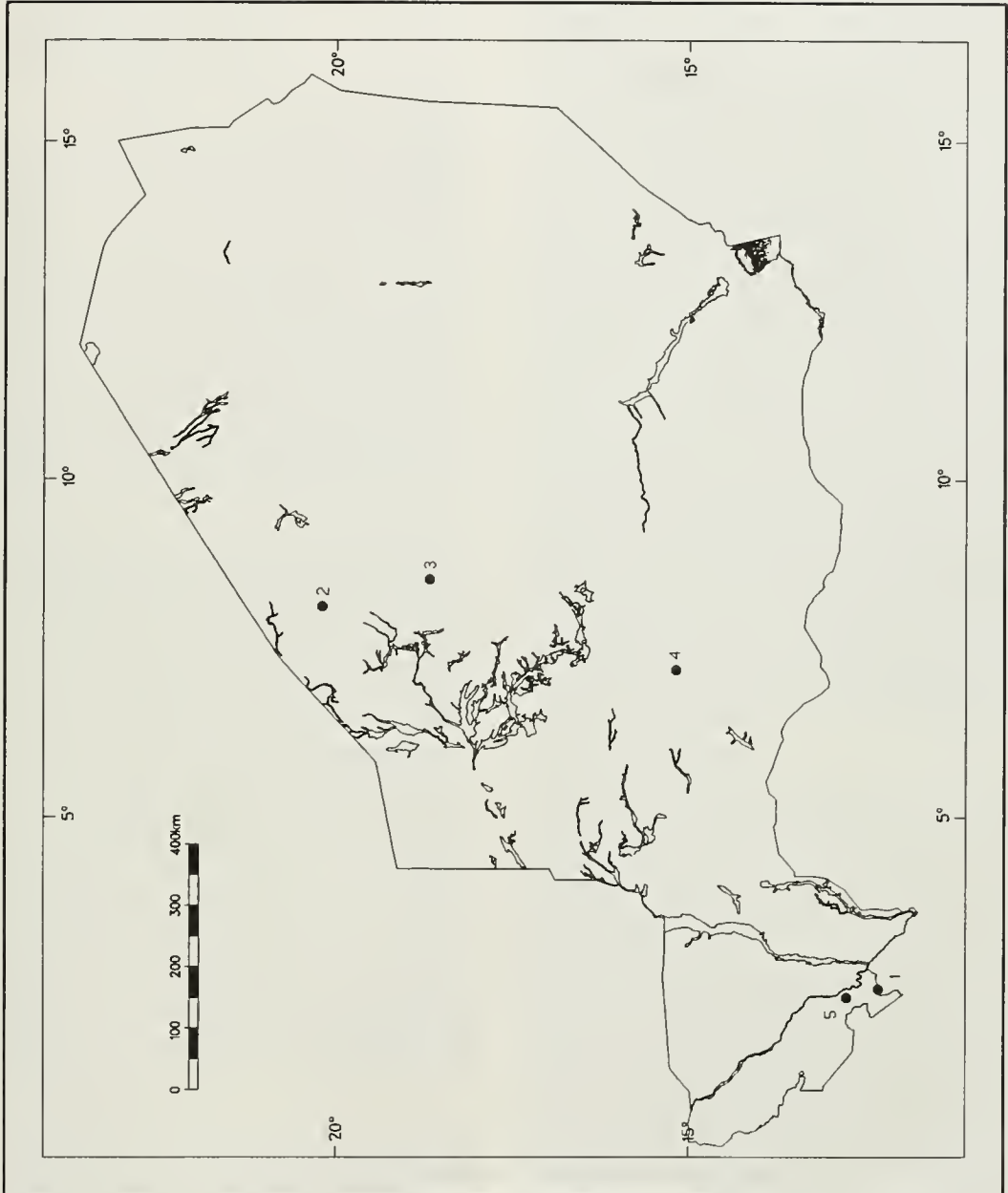
Forêt classée (Classified forest) Although cultivation of the soil is prohibited, authorisation for temporary cultivation may be granted to areas destined to be enriched with valuable species. Authorisation is by "contrats de culture" (cultivation contracts) established by the Service des Eaux et Forêts. These contracts state: identity of cultivator; the importance and situation of the land; dates of validity of the authorisation.

Collection of fruit and seed of the plant (rônier) known locally as "Miritchi" is prohibited.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
1	<i>National Park</i> W du Niger	II	220,000	1954
2	<i>Strict Nature Reserve</i> Addax Sanctuary	I	1,280,500	1988
3	<i>National Nature Reserve</i> Air and Ténéré	VIII	7,736,000	1988
4	<i>Total Faunal Reserves</i> Gadabedji	IV	76,000	1955
5	Tamou	IV	77,740	1962
6	<i>Partial Faunal Reserve</i> Dosso	IV	306,500	1962
	<i>Ramsar Wetland</i> Parc national du "W"	R	220,000	1987



Protected Areas of Niger

NIGERIA

Area 923,770 sq. km

Population 118.8 million (1990)

Natural increase: 2.9% per annum

Economic Indicators

GDP: US\$ 205 per capita (1987)

GNP: US\$ 290 per capita (1988)

Policy and Legislation The protection of wildlife began with the creation of Nigeria, soon after the amalgamation of the northern and southern parts of the country in 1914. Regional game laws were enacted, initially by eastern Nigeria in 1916 and later by the western and northern regions in 1928 and 1963, respectively. The conservation and protection of wildlife is still governed by these three game laws and their subsequent modifications commensurate with the creation of states in 1967 and 1976. In 1973 a more unified and detailed national wildlife conservation law, entitled the National Fauna Conservation Law was drafted (TWCC, 1983). It has subsequently been revised and updated by the Endangered Species (Control of International Traffic and Trade) Decree No. 11.

The three categories of protected area recognised within the wildlife sector are strict nature reserve, game reserve and national park, all of which were formerly reserved forest (see Annex). Strict nature reserves, which were first constituted in 1954, were established in accordance with the 1933 London Convention (see Annex). Modern game reserves, created by state legislation, incorporate areas where hunting is strictly regulated, habitat is protected, and where wildlife is conserved, managed and propagated (Anadu and Oates, 1982). The first national park to be created was Kainji Lake National Park in 1975 by a Federal Military Government Decree (Afolayan, Ajayi and Ayeni, 1982). This decree was repealed with the enactment of the National Parks Decree No. 36 of 26 August 1991. By virtue of this Decree, Kainji Lake was reconstituted as a national park, and five new national parks were established. The Decree also makes regulations for the administration and management of national parks in the country, and provides for the establishment of a National Park Governing Board and National Park Management Committees for each national park (see Annex).

Under the current national wildlife policy, all aspects of wildlife utilisation are emphasised, namely, recreation and tourism, bushmeat production and preservation for future generations (TWCC, 1983). Further, the policy states *inter alia* that wildlife shall be conserved in order to protect the national heritage (Anadu, 1987).

Forestry legislation was originally promulgated under the Forest Ordinance of 1937 (Chapter 75) and has since undergone numerous revisions. This has been applied to the principal states by a series of amendments. The

revised Northern Nigerian Forestry Ordinance of 1960 is significant in that provisions are made for a dual system of land tenure and forest reservation involving both government and local communities. Part II of the Ordinance is concerned with the constitution of government forest reserves and protected forests (see Annex), usage of rights, boundary modifications based on land claims, and the dereservation of such reserves. Parts III, IV and V of the Ordinance deal with the constitution of native authority and local government council forest reserves and protected forests (see Annex). Provisions and regulations for these reserves are largely similar to those for government forests reserves and protected forests. Local authorities are responsible for the protection, control and management of such areas and have the power to revise reservation orders and to dereserve areas, subject to ministerial approval. Under certain conditions, government forest reserves can be converted to native authority or local government council reserves. The state forest service supervises the protection, control and management of such reserves by local bodies. In the event of serious shortcomings or deficiencies, the Chief Conservator of Forests may guide and direct the management and control of local reserves on behalf of the local bodies involved. Communal forest areas (Part VII) may be declared and dereserved by a local government council or native authority on behalf of an interested community. Local authorities make rules on the utilisation of communal forests, outline duties of native communities, make restrictions on sale or export of forest products, allow for the establishment of nurseries and agro-forestry activities, and provide for the protection of forest areas.

There are a number of shortcomings to current protected areas legislation. Legal and financial support for the implementation of the national wildlife policy have been lacking, and state wildlife laws need revamping. At present, the pace and focus of development (e.g. tourism, bushmeat production) in game reserves is completely at the discretion of the various state departments of forestry. Currently, there is no legal distinction between strict nature reserves and either forest or game reserves in which they may be situated (Ola-Adams and Iyamabo, 1977). A legal distinction between these categories would enable authorities to prohibit activities which are incongruous with the objectives for their establishment. Current forest legislation is ineffective because it does not control the exploitation or management of valuable forest resources. Further, there is a need for new legislation to control the management and protection of forest reserves to promote conservation of biological diversity and genetic resources (WCMC, 1988).

International Activities At an international level, Nigeria is party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), and participates in the

Unesco Man and Biosphere (MAB) Programme. To date, no natural sites have been inscribed on the World Heritage List, and one site was accepted as a biosphere reserve in 1977. Nigeria is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).

At the regional level, Nigeria is party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area. Nigeria also signed an agreement in 1977 with the Republics of Chad, Niger and Cameroon for the joint control of the fauna and flora of the Lake Chad basin.

Administration and Management In the late 1980s, the Federal Natural Resource Conservation Council (NRCC) was created. This Council is chaired by the President with representatives from a number of Ministries and from the Nigerian Conservation Foundation. This Council provides coordination for the conservation of natural resources, develops policies, can take direct measures to secure the status of species and sites, monitors conservation activities within the forestry and wildlife sectors, and provides funds for conservation and research work. A great deal of the Council's work is carried out by state government agencies, and the NRCC is responsible for promoting the National Conservation Strategy (Stuart and Adams, 1990; WCMC, 1988). The Federal Environmental Protection Decree of 1988 authorised the constitution of an Environmental Protection Agency (EPA) which has advisory powers at the national level (Caldecott *et al.*, 1989, 1990).

At the national level, the mandate for wildlife conservation and protected areas management is the responsibility of the Federal Department of Forestry in the Ministry of Agriculture, Water Resources and Rural Development (Caldecott *et al.*, 1989, 1990; Holland *et al.*, 1989). Within this Department, is the Division of Wildlife and Conservation, which is responsible for wildlife development and extension, and the enforcement of international wildlife conventions (Anadu, 1987). Responsibilities of the National Park Governing Board, established by virtue of the National Parks Decree (1991), include: advising the federal military government and the state governments on the development and preservation of national parks; promoting the protection and conservation of flora and fauna in such areas; and coordinating the activities of the various national park management committees. These committees are responsible for ensuring that the provisions of the National Parks Decree are carried out within each national park. Each state Department of Forestry is responsible for the creation and management of forest reserves, game reserves and strict nature reserves.

Within the wildlife sector, management of protected areas stretches as far back as 1932 when Colonel A.H. Haywood suggested the creation of a game department to coordinate wildlife development and the establishment

of game reserves in the savannah area (Anadu and Oates, 1982). A Wildlife Standing Committee, to become known as the National Wildlife Conservation Committee (NWCC) in 1967, was established by the National Council for Natural Resources in 1958. This was followed by the creation of the Division of Wildlife and Conservation in 1972. Historically, a number of initiatives have been undertaken at the regional level. In 1953, a Northern Regional Game Preservation Committee was set up, closely followed by the establishment of a Game Preservation Unit within the Forestry Division in 1956 (Mshelbwala, 1988). In that same year, the eastern region created a Wildlife Advisory Committee, followed by the establishment in 1963 of a Game Preservation Unit in the western region (Anadu, 1987).

Within the forestry sector, management of forest reserves stretches back to the turn of the century when the first forest reserves were created. Regional forestry services were created in 1952, with the northern region taking the lead (Anadu, 1987). In practice, reserve management often emphasises participation of the local community in conservation programmes, providing employment within the reserves for local people where possible.

Under the Forestry Amendment Edict of 1969 (Western State), provision was made for the creation of a Forest Advisory Commission. One of the functions of this commission is the formulation of short and medium-term policies on all aspects of forestry.

The National Wildlife Conservation Committee (NWCC), which is an appendage of the National Forestry Development Committee (NFDC), plays a significant role in protected areas establishment and management. The NWCC gives formal approval to the creation of national parks and, at the state level, approves the transformation of forest reserves to game reserves. It is also responsible for reviewing progress in wildlife management; discussing strategies for future development; coordinating and formulating policy on wildlife management at the national level; maintaining uniformity of standards and coordinating development programmes for game reserves and national parks; developing effective conservation laws which apply to conservation and non-conservation areas alike; and serving as a clearing house for the creation of game reserves, based upon proposals from state Forest Departments (TWCC, 1983). This committee, a parastatal of the Federal Department of Forestry, was instrumental in the creation of the national park. Research and training in wildlife management is handled by the Federal Forestry Research Institute of Nigeria.

The Nigerian Conservation Foundation (NCF), a private non-profit organisation, was established in 1982, and actively promotes all aspects of conservation in the country (Anadu and Green, 1990). NCF is active in conducting baseline surveys of representative game reserves, providing funds and support for conservation

projects, and in 1985, assisted the Federal Department of Forestry in drawing up a national conservation strategy (Anadu, 1987; Ebin, 1983; WCMC, 1988). In collaboration with IUCN – The World Conservation Union, African Wildlife Federation, International Council for Bird Protection (ICBP) and Royal Society for the Protection of Birds (RSPB) efforts have been focused on the conservation of important wetland habitats (WCMC, 1988). WWF-UK has been active in the preparation and implementation of management plans for the recently established Cross River National Park.

There are a number of constraints to protected areas management. Policy implementation and law enforcement is lacking, infrastructural facilities (e.g. vehicles, communications equipment, road and track networks) are limited, and a lack of basic information necessary for effective management in wildlife sector and forest reserves is preventing sound management (Afolayan, 1980; Anadu, 1987; Ola-Adams, 1987). It has been recommended that fully-fledged federal and state wildlife departments be created to address some of these constraints (TWCC, 1983).

Systems Reviews Nigeria is bordered by Cameroon and Chad to the east, Niger to the north, and Benin to the west. To the south is the Gulf of Guinea, the country having a 780km long coastline, excluding the indentations of Lagos Lagoon, the Niger Delta and Cross River Estuary (Hughes and Hughes, 1991). Most of the country is relatively low-lying and flat, with about 80% of the area below 600m. Highlands greater than 1,000m are restricted to the Jos Plateau in the north-central region and montane areas in the east (Anadu and Green, 1990).

The biogeographic affinities are predominantly Guinea-Congolian in the south and Sudanian in the north with a broad transition zone across the centre of the country. Afromontane elements are found in the east, while Sahel regional transition zone is found in the extreme north-east (Stuart and Adams, 1990). Two broad ecological zones in Nigeria are: a mosaic of savanna and wooded savanna, which occupies four-fifths of the land area; and forest which constitutes the remainder. Lowland rain forest, a mosaic of lowland rain forest, woodland and secondary grassland, Sudanian woodlands, plateau and montane vegetation, Sahel vegetation, herbaceous, swamp and aquatic vegetation, and mangrove are the major vegetation formations in the country, most of which have been extensively modified (WCMC, 1988).

In 1876, it was estimated that 60 million ha of total area was under forest. By 1985, this figure had fallen to 9.4 million ha (Nwoboshi, 1986). Further, Anadu and Green (1990) have estimated that Nigeria has lost more than 90% of its primary moist lowland forest. Most rain forests only remain as small isolated reserves (WCMC, 1988). Drought-induced desertification in the Sahelian region has been exacerbated by impoundments and

agricultural developments, particularly irrigation schemes (WCMC, 1988).

The coastal wetland system includes large lagoonal systems with mangrove swamps, palm-pandan swamps and reed swamps in the west, while in the east, the Niger Delta and Cross Estuary support large areas of mangrove forest and freshwater swamp forest (Hughes and Hughes, 1991). Inland, there are flood plains on many rivers (Niger/Benue River System; Komadugu Yobe; and the Ngadda, Yedseram, and El Beid rivers) and in the north of the country, a number of other seasonal wetlands away from rivers. Mangrove swamp forest has been estimated at 970,000ha, extending from Cameroon to the Benin coast (FAO/UNEP, 1981; WCMC, 1988). Moses (1985) has estimated that mangroves cover 504,800ha in the Niger Delta alone. Mangrove and marine elements are currently missing from the protected areas network, although the federal government is drawing up proposals for mangrove conservation. Lake Chad and the riverine wetlands are afforded a degree of protection in the current reserve network. Further, protection of the Hadejia-Nguru Wetlands, tributaries of Lake Chad, received a boost with the launching of the Hadejia-Nguru Wetlands Conservation Project in 1987 (Stowe and Coulthard, 1990). Threats to coastal areas include potential damage from oil exploration activities, while dam construction is having serious impacts on wetlands and floodplain forests (Start and Adams, 1990).

The constitution of forest reserves stretches back to the turn of the century, followed by a vigorous period of reserve expansion in the 1920s and 1930s (Ola-Adams, 1987). By 1933, the Fauna Preservation Society of London was mounting pressure on Nigeria to increase from 12 the number of game reserves created in 1916 (Anadu, 1987; Ayeni *et al.*, 1982). Although the number of reserves rose to 29 by 1960, it was only after independence that vigorous attempts by federal and state authorities were embarked upon to promote conservation objectives (Anadu, 1987). Subsequently, an additional number of game reserves were proposed and gazetted, Kainji Lake National Park was formed in 1975, and a number of other national parks were created by virtue of the National Parks Decree of 1991. Strict nature reserves had their beginnings as inviolate plots laid down by the Nigerian Forest Department in 1946. Since 1954, these areas have been designated as strict nature reserves by the Federal Department of Forest Research, now the Forestry Institute of Nigeria. Currently, about 4.5% of total area is under some form of protection for wildlife conservation (WCMC, 1991). Nearly 12.5 million ha is reserved forest estate, of which 80% is found in savanna woodland and 20% is in closed forest (Ola-Adams, 1987; WCMC, 1991). While national parks, strict nature reserves and game reserves serve a conservation function, the remainder of the forest reserves serve a production function and are managed primarily for timber extraction (WCMC, 1988).

Certain recommendations for action have been outlined in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). The protected areas network is inadequate, particularly as most of it lies in the savanna biome (Drolet, 1990; WCMC, 1988). Areas of lowland, swamp and montane forest, and forest outliers need to be identified and protected (WCMC, 1988). The formulation of management plans for the majority of game reserves, comprehensive ecological monitoring programmes of wildlife species in wildlife sector reserves, and improved management and protection of forest reserves in the lowland rain forests are priorities (Afolayan, 1980; Ola-Adams, 1987). In addition, integrating conservation with the sustainable use of natural resources is a priority in the context of establishing rural development programmes. In general, protected areas that exist in forests are too small for viable populations of many species (Stuart and Adams, 1990).

Recent conservation initiatives include: a national review of the protected areas system, conducted in 1991 under the auspices of the Tropical Forestry Action Plan and funded by the EC; the formulation of a conservation action plan by the federal government; a government/IUCN wildlife study which is looking at the current status of wildlife resources, is assessing species conservation priorities, and is designing a long-term monitoring programme; and a number of multi-agency projects aimed at protecting and managing a number of specific protected areas (Stuart and Adams, 1990; Caldecott, pers. comm., 1991). The legal establishment of Cross River National Park has improved protected areas coverage in the rain forest zone.

Threats to the protected areas system include: shifting cultivation and over-exploitation of indigenous plant species; subsistence and commercial agriculture; illegal grazing in protected areas; cattle migration; poaching; uncontrolled bushfires; drought, particularly in savanna regions; an ever-increasing fuel wood and timber demand; unsuccessful plantation establishment and settlements within reserves; expansion of road networks; oil exploration and extraction activities (Bendel state); and local irrigation and damming schemes (Afolayan, 1980; Anadu, 1987; Anadu and Oates, 1982; Ola-Adams, 1987; Osemeobo, 1988). Several areas of the forest estate are being dereserved for agricultural, industrial or pastoral purposes (Ola-Adams, 1987).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: International Convention for the Protection of Fauna and Flora (London Convention)

Date: 1933

Brief description: Promotes the establishment of protected areas and the conservation of wildlife.

Administrative authority: State Departments of Forestry (Chief Conservator)

Designations:

Strict nature reserve An area under public control in which prohibited activities include: any hunting or fishing; activities related to forestry, agriculture or mining; any work which alters the configuration of the soil or the character of the vegetation; any activity which is likely to harm flora and fauna; and the introduction of any indigenous or imported species of fauna and flora.

Written consent is required to enter, traverse or camp in such areas. Scientific research may only be undertaken with permission from the competent authorities.

Source: Original legislation

Title: Federal National Parks Decree (No. 36)

Date: 26 August 1991

Brief description: Allows for the creation of national parks in areas of national significance.

Administrative authority: National Parks Board (Chairman)

Designations:

National park The President is empowered by virtue of this decree to declare National Parks anywhere in the Federation with the States' consent.

Previous legislation pertaining to national parks is repealed by this decree.

Such areas are set aside exclusively for the propagation, protection, conservation and management of the vegetation and wild animals therein.

Unless authorised, the following activities are prohibited: forestry, agriculture, grazing, mining,

excavation, or prospecting; flying over a national park at altitudes lower than 200m; any drilling, levelling of the ground or construction; any water pollution; the hunting or capturing of any animal; uprooting, burning or damaging any tree or plant; setting fire to any vegetation; introducing any plant into such areas; cultivating of the soil or making a farm or plantation; obstructing the channel of any river or stream; fishing or attempting to fish; the setting of any snare, trap or other instrument for the purpose of capturing animals; and any act likely to harm or disturb the flora and fauna of such areas.

Sources: Original legislation; Caldecott *et al.*, 1989, 1990

Title: Forestry Ordinance – Northern Region

Date: 1937, last amended 1960

Brief description: Allows for the establishment and management of reserves in the Northern Region.

Administrative authority: Department of Forestry, Northern Region (Chief Conservator)

Designations:

Government forest reserve and Protected forest
Any lands at the disposal of the government, native lands or lands to be protected or reserved for forest growth may be constituted by an appropriate Governor.

Three months after a notice is published in the regional *Gazette*, an order issued by the Governor constitutes land as a forest reserve.

Within any forest reserve, the Minister of the Region may close any right of way or watercourse for its protection.

Prohibited activities include: the taking and selling of forest produce without a licence; any act which leads to the destruction of the forest estate;

obstruction of waterways; and the kindling of fires without consent.

Native authority or Local government council forest reserve Any land within the jurisdiction of a native authority or local government council may be constituted as native authority or local government council forest reserves by these bodies.

All orders constituting native authority or local government council forest reserves shall, after approval by the Minister, be published in the regional *Gazette*.

Any sale, mortgage or transfer of land within a native authority or local government council forest reserve shall be null and void without the consent of the constituting native authority or local government council.

Prohibited activities are generally as for government forest reserves and protected forests.

Native authority or Local government council protected forest Any native authority or local government council may, by notice, declare any land within its jurisdiction to be a native authority or local government council protected forest with the approval of the Minister of the Region.

Prohibited activities are generally as for government forest reserves and protected forests.

Communal forestry area Any area within the jurisdiction of a native authority or local government council may be declared a communal forestry area with the approval of the local Resident.

Prohibited activities include the taking or sale of forest produce without consent and any acts which lead to the destruction of the forest estate.

Other prohibited activities are as prescribed for government forest reserves and protected forests.

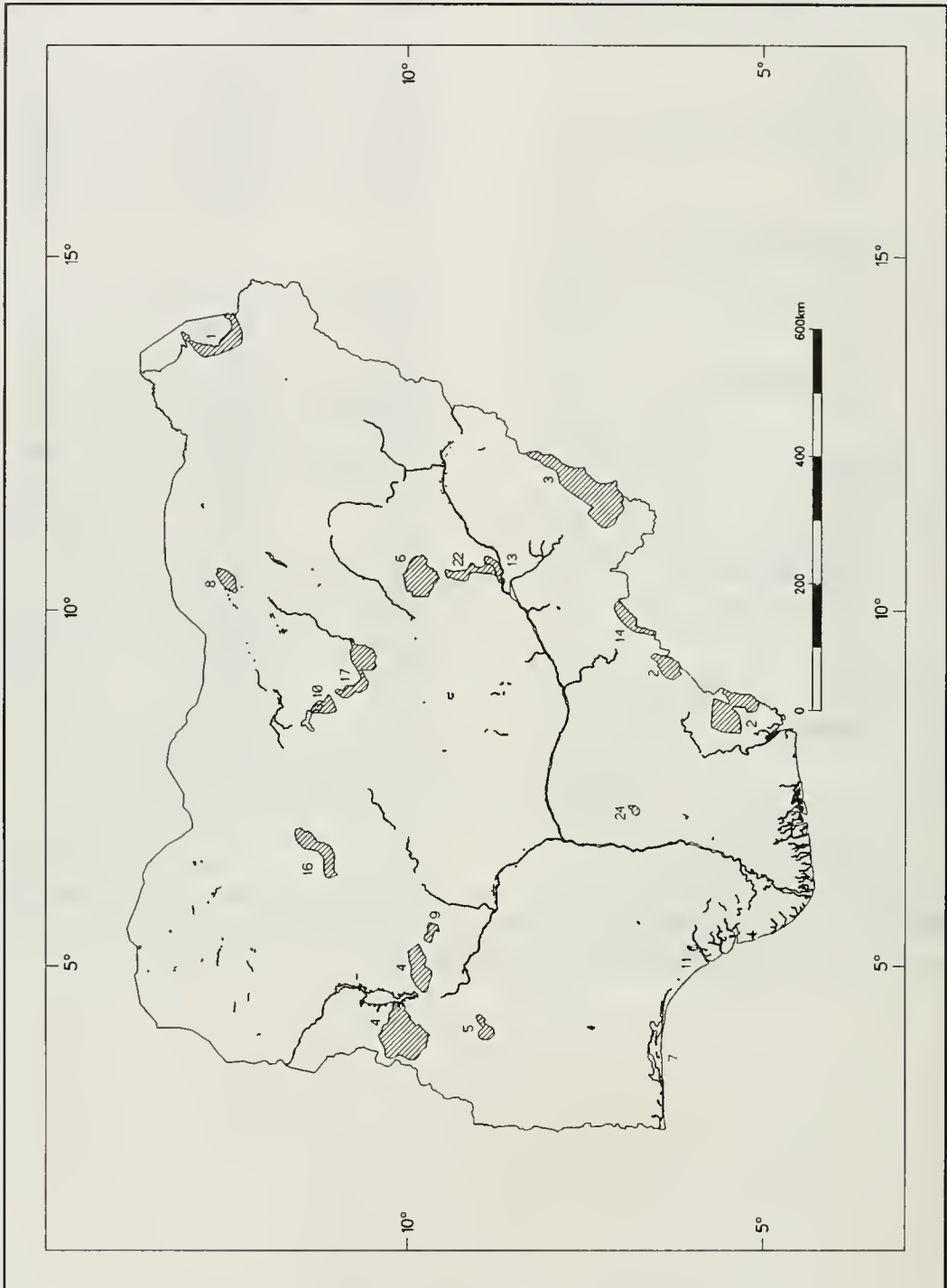
Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Chad Basin	II	45,696	1991
2	Cross River	II	422,688	1991
3	Gashaka/Gumti	II	636,300	1991
4	Kainji Lake	II	534,082	1975
5	Old Oyo	II	251,230	1991
6	Yankari	II	224,400	1991
	<i>Strict Nature Reserve</i>			
7	Lekki	I	7,800	
	<i>Game Reserves</i>			
8	Baturiya Wetlands	IV	29,700	1976
9	Dagida	IV	29,422	1971
10	Falgore (Kogin Kano)	IV	92,000	1969
11	Gilli-Gilli	IV	36,300	1916
12	Ibi	VIII	156,000	1972
13	Kambari	IV	41,400	1969
14	Kashimbila	IV	139,600	1977
15	Kwale	IV	1,340	1916
16	Kwiambana	VIII	261,400	1971
17	Lame/Burra	IV	205,767	1972
18	Margadu-Kabak Wetlands	IV	10,000	
19	Nguru/Adiani Wetlands	IV	7,500	
20	Ologbo	IV	19,440	1981
21	Orle River	IV	110,000	1916
22	Pai River	VIII	248,600	1972
23	Pandam	IV	22,400	1972
24	Udi/Nsukka	IV	5,600	1981
	<i>Biosphere Reserve</i>			
	Omo Strict Natural Reserve	IX	460	1977

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Nigeria

FRANCE – REUNION

Area 2,510 sq. km

Population 0.6 million (1989)

Natural increase: 1.8% per annum

Economic Indicators

GDP: US\$ 5,996 (1987)

GNP: US\$ 4,400 (1986) (ATLAS ECO, 1988)

Policy and Legislation Since March 1946 Reunion has been considered as a Department of France. In 1974 it also became an administrative region. The territory is covered by French legislation, some of which is applicable specifically to Reunion. For a complete list of legislation concerning protected areas under French jurisdiction, see the country sheet for France. Pieces of French legislation providing definitions of current protected areas of Reunion (nature reserves, fishing reserves and forest reserves) are listed in the Annex, as well as legislation which is specific to Reunion.

Law No. 76-629 of 10 July 1976 (Loi relative à la protection de la nature) (see Annex) applies to the protection and preservation of natural areas, plant and animal species, and natural resources, as well as the maintenance of biological equilibrium. Chapter III of the law concerns nature reserves. Decrees Nos 77-1298 of 25 November 1977 and 86-1136 of 17 October 1986, and the Circular No. 87-87 of 2 November 1987 relate to the implementation of the Law and to the management of reserves. Classification decisions are made by decree.

An Order of 8 May 1963 provides for the establishment of strict biological reserves (réserves biologiques intégrales) (see Annex). Decree No. 77-1295 of 25 November 1977 notifies the methods for establishing the orders fixing the lists of protected non-domestic animals, and non-cultivated plants. On the basis of this list, the prefect can, by an order for the protection of the biotope (Arrêté de Protection de Biotope), take measures to improve the preservation of the environment of these species (Doumenge and Renard, 1989). A decree (arrêté) of 6 February 1987 fixes the list of plant species protected in Reunion. A decree (arrêté) of 17 February 1989 fixes protection measures for animal species represented (S. Ribes, pers. comm., 1991).

Order No. 1905/DAG.R/2 of 25 May 1976, concerning the institution of marine reserves (portant institution de réserves dans les eaux maritimes du département de La Reunion), provides for the creation of fishing reserves (see Annex).

The forestry regime is fixed by an ordinance of 2 March 1949. The Forestry Code (Code forestier) currently in force in France was drawn up in 1827 and amended in 1951 and 1964. However, this has been updated by a more recent forest code of 25 January 1979 (Cutrera, 1991) (see Annex). The Law of 16 June 1977 and

decrees Nos 79-430 and 431 of 31 May 1979 recognise certain characteristics of the forests of Reunion, and provide an adaptation of the Forest Code for their management. The adaptations specific to Reunion concern the steep relief, tropical climate, cyclones and volcanic soil, and provide for constraints in clearing, exploitation and protection work in forests and for the reinforcement of the forest regime concerning the protection of "forêts soumises", as well as the extension of certain arrangements concerning the notification and follow up against infractions within private forests (Doumenge and Renard, 1989).

A piece of legislation specifically relates to areas prone to erosion: peaks, ravines etc. All clearing, exploitation and grazing is prohibited within these areas, and within 10m of rivers and ravines. Protection areas around water sources extend up to 100m: around lakes the minimum protection area is 50m.

Under Law No. 83-663 of 22 July 1983, the possibility of establishing protection areas (périmètres de protection) is provided for. Following a demand from proprietors, a decree of the Council of State (Décret en Conseil d'Etat) provides for a category of private reserve: voluntary nature reserve (réserve naturelle volontaire). For these, Circular No. 87-87 notifies that the agreement is valid for six years, renewable by mutual agreement (Doumenge and Renard, 1989). A Law of 2 May 1930 allows for the protection of natural monuments and sites of artistic, historic, scientific, legendary or aesthetic importance.

Following a tripartite agreement between the Minister for the Environment, the Minister for Agriculture and the National Forest Office, territories may be classified as state biological reserves (réserves biologiques domaniales). A Decree of the Minister of Agriculture in agreement with the Minister for the Environment, officially confirms their classification. This type of reserve permits the assurance of the protection of biotypes and rare or threatened species; the protection may be total or directed.

Under Article 86 of the Code of the State Domain (Code du Domaine de l'Etat), a littoral band is defined. Areas within the littoral zone are preserved if they are: wooded, beaches, parks, public gardens or covered in natural vegetation. Law No. 86-2 of 3 January 1986 concerning the management, protection and development of the littoral zone (in application of Article L 111-1 of the Urban Code) (Loi relative à l'aménagement, la protection et la mise en valeur du littoral) is the general law concerning the littoral area. Wooded parts of the littoral benefit from special arrangements under this law, for touristic and leisure as well as for ecological reasons (Doumenge and Renard, 1989).

Forest policy is drawn up by the National Forest Office for the government. The National Forest Office also prepare and implement management plans for specific areas (C. Doumenge, pers. comm., 1991). The National Forest Office is provided for under "Loi de finance rectificative du 23 décembre 1964 créant l'Office national des forêts" (Cutrera, 1990). The Law of 10 July 1975 provides for the creation of the Conservatoires de l'Espace Littoral et des rivages lacustres. The Decree of 1 September 1977 institutes the Council for Shores (Conseils des Rivages) within the Overseas departments (Départements Outre-Mer), which in the instance of Reunion is the Council for French Shores in the Indian Ocean (Conseil des Rivages Français de l'Océan Indien). Legislation is reviewed in SREPEN (n.d.).

International Activities See country sheet for France.

Administration and Management Management of nature reserves is the responsibility of the National Forest Office, a national, public organisation with an industrial and commercial character, which benefits from relatively autonomous management. It is involved not only with state, departmental, communal and regional forests, but also acquisitions within the Conservatoire de l'Espace Littoral et des Rivages Lacustres. By tradition, the office also manages private forests. Its activities are diverse, and concern all aspects of management of the forest domain: maintenance, reforestation, exploitation, surveillance and protection, although its main responsibility concerns forest production. The office is also responsible for executing police duties, in particular combatting infractions against the law where forests, hunting and fishing are concerned, despite the creation by Decree of 31 October 1986 of the Department of Agriculture and Forests (Direction de l'Agriculture et de la Forêt) which allocates these tasks to the public sector (Doumenge and Renard, 1989). The National Forest Office is responsible for the management of around 1,000 sq. km, which accounts for 40% of the island.

Management of reserves is the responsibility of agents of the National Forest Office, aided by the gendarmerie. However, there are still insufficient staff for the work involved, and no staff are employed within reserves. The reserves are open to public access and although established in areas of low human activity, with the tradition of gathering firmly established and high unemployment, many people are tempted by poaching (Cheke, 1987b; Doumenge and Renard, 1989). Fishing reserves are the responsibility of the Administration of Marine Affairs (Administration des affaires maritimes).

The Ministry of the Environment is normally present within each region as a Délégation Régionale à l'Architecture et l'Environnement (DRAE). However, due to the single department status of Reunion, the Ministry of the Environment, by a decision of 5 March 1982, created a Chargé de Mission, with the function of a DRAE (Doumenge and Renard, 1989). Responsibilities of the Mission include activities

necessary for the protection of the natural heritage, such as environmental impact studies, procedures for the creation and management of reserves, education and awareness programmes.

The Conservatoire de l'Espace Littoral et des Rivages Lacustres was created in 1975 to manage the coastal zone in France and its departments, including Reunion, and plays an important role in appropriating land for protection and management (Doumenge and Renard, 1989; UNEP/IUCN, 1988). The Council for French Shores in the Indian Ocean (Conseil des Rivages Français de l'Océan Indien) is responsible for protecting natural areas and maintaining the ecological equilibrium. Areas acquired under this management are inalienable.

Although laws concerning protection of areas liable to erosion are precise, application of these laws is in contrast very vague (Doumenge and Renard, 1989). Although the legislation providing for conservation appears impressive, the current system is widely thought to be inadequate (Cheke, 1987b; SREPEN, 1981).

Systems Reviews Reunion, the most south-westerly, as well as the youngest, of the Mascarene Islands, is situated about 650km south-east of Madagascar, and 164km west-south-west of Mauritius. The island dependencies of Reunion are located over a wide area of the south-west Indian Ocean and Mozambique Channel: Tromelin to the north of Reunion; Europa and Bassas da India in the Mozambique Channel; Juan de Nova off the west coast of Madagascar; and the Iles Glorieuses to the north of the Mozambique channel off the north-west coast of Madagascar (UNEP/IUCN, 1988).

Formed from two volcanic cones, one of which is still active, Reunion is mountainous, and has the highest peak (3069m) in the Indian Ocean. Relief in general is highly contrasted, the volcanic massifs being cut by deep erosion ravines, with cliffs commonly over 1,000m high. Geologically, there are two overlapping shield volcanos: an older extinct one, centred on the Piton des Neiges, much dissected into gorges and erosion basins surrounded by ramparts known as cirques, and the still active Piton de la Fournaise. A flat littoral plain encircles the island. There are no reefs on the north, east or south-east coasts, but 10-12km of fringing reef are found on the south-west coast. The island's youth and the narrow, insular shelf surrounding it are presumed to explain at least partially the relative lack of reef development found here compared with the other Mascarene Islands. Tromelin, Juan de Nova, Europa, Bassas de India and Iles Glorieuses are coralline islands or atolls.

High degrees of endemism are found in both flora (30% of flowering plants out of around 500 species and about 12% from more than 200 ferns and allies) (Baumer 1981; Cadet, 1977; Davis *et al.*, 1986) and fauna (Cheke, 1977, 1987b). Introduced plant species may number up to 1,000 (Doumenge and Renard, 1989).

Prior to the arrival of the first human inhabitants at the beginning of the 17th century, the island was entirely forested. Four types of forest were recognised: dry, megathermic (leeward side) and humid megathermic (windward side) at low altitudes; mesothermic hygrophile forest at mid to high altitude; and ericaceous thicket at high altitude. The altitude and the ruggedness of the terrain has meant that large areas of upland vegetation have remained more or less untouched by man's influence, although these have come under progressively greater pressure from fires and as use for pasture. The relatively small area of lowland forest, however, has been all but totally destroyed for agriculture and by fire, grazing and competition from exotic species. Some areas of mangrove occur. Invasion by alien plant species is widespread throughout the remnant native ecosystems. Outside these remnants, alien plants completely dominate the modern Reunion landscapes (Bossler, 1983; Cheke, 1987b; Macdonald *et al.*, 1991; White, 1983). Threatened plants of Reunion are listed by Dupont and Girard (1989).

Sugar cane, introduced in the first half of the 19th century, is the principal crop grown, occupying around 65% of cultivable land. Other export crops includes perfume plants (geranium and vetiver), vanilla and tobacco. A diverse range of crops is grown for local consumption (Cheke, 1987b; Doumenge and Renard, 1989).

Protected areas were first established in 1963 with the creation of two strict biological reserves. The islands of Tromelin, Iles Glorieuses, Europa and Bassas Da India were declared nature reserves in 1975. An earlier piece of legislation protected Juan de Nova though not Bassas Da India. Three fishing reserves have been established within the lagoons, and offshore from the reefs which lie between Cap la Houssaye and the Etang-Salé. These fishing reserves are managed in rotation. At any time fishing is prohibited within one of the reserves for a period of three years. Recently the National Forest Office created four state biological reserves (Doumenge and Renard, 1989).

In 1982, a study of the national forests, to identify sites for the creation of biological reserves, was undertaken by botanists of the University of St Denis and the Institut Français de Recherche Scientifique pour le Développement en Coopération, at the request of the National Forest Office (Bossler, 1983). The subsequent report has served as a guide for the implementation of conservation activities within Reunion (Doumenge and Renard, 1989). Recommendations are given for better management of the existing St Philippe-Mare-Longue Reserve, to prevent the invasion of non-indigenous plant species. Twelve areas of the least disturbed indigenous vegetation are proposed for establishment as managed biological reserves. Invasion by exotic plant species is such a problem that without management, attempts to preserve indigenous plant species would be futile (Bossler, 1983). The urgent need for the establishment of a reserve at Plaine des Chicots, particularly for the

preservation of the endemic tuit-tuit *Coracina newtoni* is stressed by Chereil *et al.* (1989).

Recently, there has been talk of a national park being established in addition to (and encompassing some of) the existing proposed protected areas (R. Safford, pers. comm., 1991).

In their review of the effects of alien plant invasions on native vegetation remnants in Reunion, Macdonald *et al.* (1991) conclude that it is not too late to halt further degradation of those habitats supporting remnants of native ecosystems. They recommend establishment of an overall policy to manage alien plants, of which one of the aims should be the establishment of "intensive control areas". A comprehensive report on the forests, which includes recommendations to improve the protected areas system, is given by Doumenge and Renard (1989). Despite the high rate of endemism and the rarity of certain plant and animal species, there are insufficient nature reserves.

Both MacKinnon and MacKinnon (1986) and IUCN (1987) include sections on Reunion. Proposals in the reports include establishing nature reserves to protect mountain forest, and improving the marine protected areas system.

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Loi No. 76/629 relative à la protection de la nature (Nature Conservation Act No. 76 629)

Date: 10 July 1976

Brief description: Provides definitions of the categories listed below, as well as modifications to the forest code and the rural code.

Administrative authority: Ministry responsible for nature protection

Designations:

Réserve naturelle (Nature reserve) Area in which conservation of fauna, flora, subsoil, water, mineral and fossil deposits and, in general, the natural surroundings is of particular importance or which require the suspension of all artificial intervention that might lead to their degradation.

Classification may involve "le domaine public maritime" or French territorial waters.

Factors taken into consideration include: preservation of species and habitats in danger of disappearing from part or all of the national territory; reconstitution of animal or plant populations and their habitats; conservation of botanical gardens and

arboretums which form reserves of rare plant species or those under threat of disappearance; preservation of biotopes and formations of geological, geomorphological or speleological interest; preservation or constitution of stop-over points on major migration routes; scientific or technical studies indispensable to the development of human knowledge; sites of particular interest for the study of evolution.

Alterations of any sort may only be made following special authorisation from the minister responsible for nature protection.

Sites are established by decree. Procedures to follow in order to classify or declassify a site are stipulated.

Penalties for infractions against the law are stipulated, and include fines of up to FF 80,000.

Réserve naturelle volontaire (Voluntary nature reserve) Privately owned land may be established as voluntary nature reserves, by mutual agreement with the owners.

A decree from the Conseil d'Etat states the length of the agreement, as well as general regulations concerning the reserve. Penalties for infractions

against state owned nature reserves apply equally to voluntary nature reserves.

Source: Original legislation in French

Title: Loi relative aux forêts de protection (law relating to forests required for protection); Décret portant règlement d'administration publique déterminant les conditions d'application de la Loi du 28 avril 1922 relative aux forêts de protection (Decree containing public administrative regulations determining the conditions of application of the Law of 28 April 1922, relating to protected forests)

Date: 28 April 1922 (amended 1976); 2 August 1923

Brief description: Provides for the designation of protected forests/forests required for protection.

Administrative authority: National Forestry Office

Designations:

Forêt de protection (Protection forest) State or privately owned forests, declared as such by the National Forestry Office after the production of a detailed survey report.

Private owners must submit their own regulations for approval by the Forestry Department if they wish to undertake forestry practises in these forests.

Special authorisation to make cuttings on a one-off basis, subject to conditions concerning the restocking of the area within a specified time limit, may be granted.

Removal of dead wood and wind fallen trees does not require administrative authority.

Excavation for the extraction of material is not permitted without prior authorisation from the administrative authorities.

Grazing is restricted, although permission may be granted for limited grazing in areas which the administrative authorities consider can be protected against injury. In no case are goats allowed.

The National Forestry Office may carry out such work as it considers necessary with a view to the consolidation of the soil, protection against avalanches, protection against fire, re-stocking the vacant spaces, and improving the forest stands.

Owners and persons having right of use of these forests may apply for compensation from the

Forestry Department, which is granted for five-year periods, and may be revised after these. There is also a provision for the acquisition of these forests by the state – this usually occurs at the request of the owner as a result of revenue lost from the classification of the forest.

Source: Anon. (1923?)

Title: Arrêté No. 1905/DAG.R/2 of 25 May 1976 portant institution de réserves dans les eaux maritimes du département de La Réunion (Order concerning the institution of reserves in the marine waters of the department of Reunion)

Date: 25 May 1976

Brief description: Provides for the creation or fishing reserves around Reunion

Administrative authority: Administration des Affaires Maritimes

Designations:

Réserve de pêche (Fishing reserve) All fishing within the Reunion lagoon for either professional or leisure purposes is prohibited, other than by fishing by line, on foot.

Fishing for small fish known as "capucins nains" and for bait may be permitted by the administrator of marine affairs.

Outside the lagoon, the reserve is divided into three parts. Fishing is prohibited in one of these for three years, in rotation with the other two

Source: Original legislation in French

Title: Arrêté portant réserves biologiques intégrales (Order concerning strict biological reserves)

Date: 8 May 1963

Brief description: Provides for the creation of two strict biological reserves

Administrative authority:

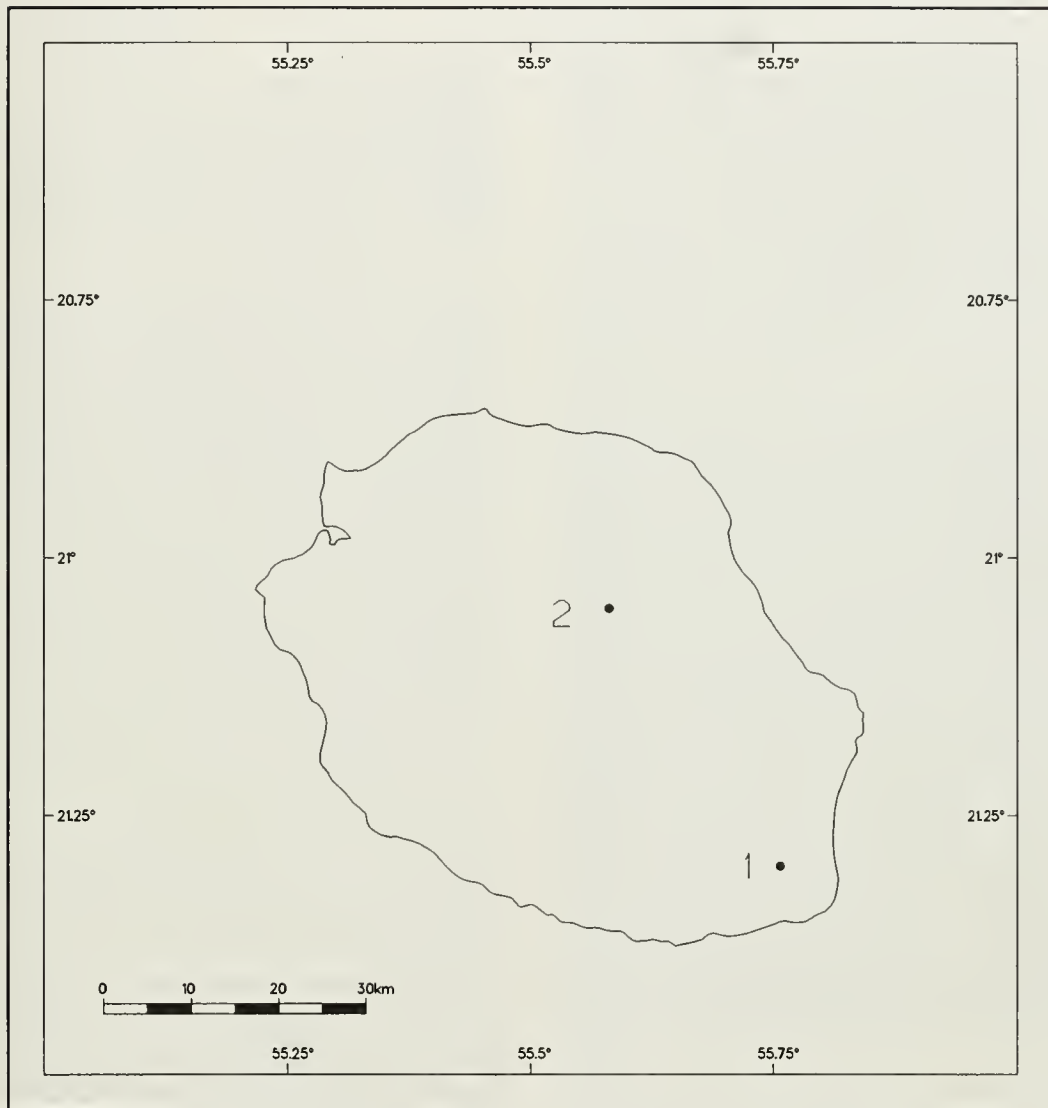
Designations:

Réserve biologique intégrale (Strict biological reserve) Area in which exploitation of any sort is prohibited.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>State Biological Reserves</i>			
1	Hauts de St Philippe	IV	4,073	1987
2	Mazerin	IV	1,869	1985



Protected Areas of Reunion

RWANDA

Area 26,340 sq. km

Population 7 million (1989)

Natural increase: 3.4% per annum

Economic Indicators

GDP: US\$ 320 (1987)

GNP: US\$ 310 (1988)

Policy and Legislation The first piece of legislation providing for protected areas created Virunga National Park in 1925. At the time Rwanda, together with Burundi and Zaïre (then known as the Congo), was under Belgian colonial rule (Spinage, 1972). In 1933 the Belgian authorities set aside all remnant forest lands as official reserves (Bissio, 1988; Weber and Vedder, 1984).

Since Rwanda achieved independence in 1962, establishment of managed areas has been provided for in several pieces of legislation. An Ordinance Law of 18 June 1973 established the National Rwandese Office of Tourism and National Parks. It provides for the integration of the former Institute of National Parks and the Office of Tourism into the new office, and for general rules applicable to national parks, hunting reserves and strict nature reserves. This piece of legislation is confirmed and modified by a Decree Law of 18 December 1973 (see Annex), (passed on the advice of the Government Council on 26 April 1974), which defines national parks, hunting reserves and special reserves or sanctuaries. Definitions follow those given in the African convention. The Decree Law of 18 December 1973 also states that special reserves are created by presidential decree, and national parks and hunting reserves are established by legislative text.

Rwanda has undertaken an extensive reshaping of its forestry legislation, with the adoption of Law No. 47/1988, shaping forest legislation (see Annex). Forestry legislation was essentially based on an old decree of 18 December 1930 that provided, amongst other things, for the creation of forest reserves and the protection of forest species. Dating from the Belgian mandate, this legislation no longer fitted the historical evolution of Rwanda. It applied to felling carried out by, or for, European settlers, leaving Rwandese nationals free to cut wood in conformity with their customary rights. Meanwhile, the rapid population growth resulted in serious deforestation which the old legislation was unable to control (FAO, 1989). To redress this state of affairs, the new legislation was adopted, the second chapter of which deals with the various components of the forest sector: public domain, community and private forest land. The public domain extends over virtually the whole of the natural area, with the exception of the public river sector, which carries other than agricultural wood or which requires reforestation for environmental conservation or rehabilitation purposes. The community forest sector consists of community forested land, public

forest land granted by the government to the community and of land to be reforested under the name of the community. The private sector comprises individually owned forest land. The Act stipulates the procedures for the classification and declassification of the lands. It also provides for the establishment of a Forest Service.

International Activities Rwanda has ratified the 1968 (Algiers) African Convention on the Conservation of Nature and Natural Resources, which provides definitions of strict nature reserves, national parks and special reserves. One site is listed as a biosphere reserve under the Unesco Man and the Biosphere (MAB) Programme. The country is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) nor does it participate in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).

Administration and Management The Rwanda Office of Tourism and National Parks (Office Rwandais du Tourisme et des Parcs Nationaux) (ORTPN), which incorporates the former Institute of National Parks and Office of Tourism, is responsible for the management of national parks, special reserves and hunting reserves. ORTPN is administratively and financially autonomous and is under the direct control of the President of the Republic. The Office is administrated by a council "Conseil d'Administration" composed of six members, including a president and vice-president. The council members are nominated for a period of four years, by the President of the Republic. The director general is responsible for daily management, including authorising tourism and scientific research within protected areas. Rangers of national parks, special reserves and hunting reserves are officers of the judiciary police. They are assisted by guards who are responsible for notifying the wardens of any infractions against the law, and for apprehending individuals who flout the law. ORTPN does not receive any money from the state, but is entirely financed by income generated through its activities. In September 1991, ORTPN had 365 employees, 194 of whom were employed in parks and reserves (ORTPN, 1991).

The Forest Service, provided for by the Forest Code, is responsible for the management of forests within the state sector and for the protection of wild fauna and flora, soil, water systems and the environment in general. It includes regional forestry commissions, responsible for the management of land within the forest domain.

The Ministry of Planning (Ministère du Plan) is responsible for outlining Rwanda's national environmental strategy (MDP, 1991). This strategy comprises nine major themes. Action needed to ensure the implementation of the strategy is specified, and

includes establishment of: an institution to coordinate management problems at all socio-economic levels; an information system on the country's environment; environmental impact studies; an environmental fund and continuous follow-up surveillance of environmental quality. The institution responsible for the first of these, the coordination of management problems, is the Environment and Development Project (Projet Environnement et Développement), which is currently very active in many areas (J. Uwilingiyama, pers. comm., 1991).

The Ministry of Agriculture, Livestock Breeding and Forests (MINAGRI) and official authorities from the east of the country are responsible for delimitation and closure of amenity forests (forêts d'agrément) and protected forests (forêts protégées).

Rwanda has received international aid for several years for nature conservation. In 1974 a large project was initiated by the Belgians called "Tourisme et Parcs Nationaux", the principal objectives of which were to develop infrastructure and tourism in protected areas, and to provide equipment and technical assistance in park planning and management. This project was completed in December 1990, and a new programme is currently being planned (ORTPN, 1991). In February 1990 the Flora and Fauna Protection Society, in partnership with the African Wildlife Foundation and the World Wide Fund for Nature, launched the International Gorilla Conservation Programme to help support conservation work throughout the range of the eastern lowland and mountain gorilla in Zaïre, Uganda and Rwanda (ORTPN, 1991; Wilson, 1991). Wildlife Conservation International supports a project in the Nyungwe forest. The World Bank is currently supporting a project to establish a forest inventory within a zone of forest (ORTPN, 1991).

Park management and protection are generally poor due to a lack of trained technical and administrative staff. The situation in Parc national des Volcans, where special efforts have been made to protect the endangered mountain gorilla, is better than in other reserves, but there are still considerable poaching problems (particularly of gorilla). The replacement of expatriate personnel by Rwandese in Parc national des Volcans has been proposed, this being considered a more effective way of maintaining the safety of the gorillas (IUCN/WWF, 1985).

Verschuren (1990), in an optimistic report after a visit to national parks in Zaïre and Rwanda, stated that protection of Parc national des Volcans was intensive and effective and demonstrated the importance that Rwanda was giving to nature conservation. He recommended that tourism in protected areas should continue to be promoted.

Poaching, using traditional techniques, occurs throughout the country. The only exception is in the use of steel cables to capture antelope and buffalo, this

method being used in both Akagera and Volcans (Volcanoes) national parks. Firearms are rarely employed, those that are used being mostly homemade and thus both ineffective for hunting as well as dangerous to use (ORTPN, 1991).

Systems Reviews Located in the heart of central Africa, astride the east African Rift, all of Rwanda lies between 1,000 and 4,500m. In general, the land mass is high and rugged, with an exceptional degree of relief in which hydrological features play an important role. The west is mountainous, the east is rolling terrain. From west to east the country may be divided into biogeographical regions: volcanic (in the extreme north-west); rift valley; the western slope; the Zaïre-Nile Massif (which divides the Zaïre and Nile watersheds); the central plateau and the eastern penepain. To the west of the mountains of the rift valley, which run north to south, the land slopes steeply to the surface of Lake Kivu on the floor of the rift valley. To the east it slopes more gently. The varied topography is responsible for diverse regional climatic conditions, rainfall being highly variable from year to year (Anon., 1981; Hughes and Hughes, 1991).

Rwanda thus contains a remarkable variety of different habitats and species. There are two major phytogeographic zones: a Sudano-Zambezian zone below 1,800m elevation, and an Afro-Alpine zone between 1,800m and 4,500m. The Sudano-Zambezian zone is sub-divided into secondary grassland mosaics, and east African bushland. This in turn is divided into shrub savanna with trees under 4m high, and acacia wooded savannah with trees over 4m high. The Afro-Alpine phytogeographic zone may be subdivided into an African montane zone above 2,000m and an African submontane zone below 2,000m. Secondary forest mosaics produced by human activity have generally replaced natural vegetation in the African submontane zone (IUCN, 1979; Rattray, 1960). Although vegetation throughout the country has been well studied, levels of endemism are unknown. However, they are thought unlikely to be high (Brenan, 1978; Davis *et al.*, 1986).

There are two great swamps, the Mugesera-Rugwero Swamps in the south and the Kagera Swamps along the Tanzanian border in the east. Minor swampy areas occur in the high valleys, as well as many extensive bogs in the mountains and on the high central plateau (Hughes and Hughes, 1991).

About 1.2 million ha is arable land, of which 1 million ha was cultivated in 1976, a wide variety of crops being grown. Eighty-seven per cent of cultivated land was devoted to subsistence crops. Principal cash crops were coffee, tea, pyrethum, cotton and quinine. Land classified suitable for agriculture is principally primary forest and artificial forest. Forest wood is used primarily for firewood and construction timber (Anon., 1981), wood being the country's main source of energy (Bissio, 1988). The dramatic recent regression in forest cover is

due principally to an extension of land used for agriculture, itself caused by demographic expansion.

In 1925 Volcans National Park was established, straddling the northern mountainous border of Rwanda and Zaïre (then known as the Congo). The park was extended in 1929 to cover the rest of the mountain chain, and adjacent areas in the Congo. The Zaïre border of the park comprises the Kivu National Park, and the Uganda side has the status of a gorilla sanctuary (Spinage, 1972). All remnant forest lands were set aside as official reserves in 1933, in response to the rapid conversion of montane forest to pasture land which had recently occurred (Bissio, 1989; Weber and Vedder, 1984). Rwanda is now one of the most densely populated countries in Africa, yet is one of the few nations in the world to have more than 10% of its land included within protected areas, most of which lies within the two national parks. The protected areas system (excluding forest reserves) now covers almost 17% of the country, in five reserves.

Proposals to improve the protected area system are given in ORTPN (1991), MacKinnon and MacKinnon (1986) and in IUCN (1987). These proposals include: the incorporation of Nyungwe Forest Reserve (a very important area for several species) in the protected area system; improvement of protection and management of existing protected areas; development of a scheme to involve local people in the management of protected areas; the extension of conservation education programme and for no further areas to be excised from the existing system. A management plan exists for Volcans National Park (Anon., n.d.). The need for a strong scientific input into the management of this park has been emphasised (IUCN/WWF, 1985). Major conservation problems for the parks are competition for land for agricultural use and poaching (MacKinnon and MacKinnon, 1986). Tourism, based on the national parks, has been vigorously promoted and was the third largest foreign-exchange earner in 1988 (Perlez, 1988; Wilson, 1991). Forest swamp reserves are under threat from drainage plans, excavation and felling (Rodgers, 1981). Problems have been reported in 1991 as a result of the incursion of armed aggressors from Uganda who have massacred animals in Akagera and Volcanoes national parks. However, by September 1991, calm had more or less returned, although shots were still being heard in the region of Volcans National Park (ORTPN, 1991; J. Uwilingiyimana, pers. comm., 1991; Vedder and Weber, 1991; Wilson, 1991).

Addresses

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Projet Environnement et Développement, Ministère du Plan, BP 46, KIGALI (Tel: 72235-72237)

Division de la gestion forestière, Ministère de l'agriculture, de l'élevage et des forêts, BP 621, KIGALI

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Décrét-Loi du 18 décembre 1973
Portant Confirmation et Modification de
l'Ordonnance-Loi du 18 juin 1973 Portant
Creation de l'Office Rwandais du Tourisme et
des Parcs Nationaux (Decree Law of 18 June
1973 confirming and modifying of
Ordinance-Law of 18 June 1973 concerning
the creation of the Office of Tourism and
National Parks of Rwanda)

Date: 18 December 1973

Brief description: Establishes the Rwanda Office
of Tourism and National Parks (ORTPN) and
designates protected areas.

Administrative authority: Office Rwandais du
tourisme et des parcs nationaux (Rwanda Office of
Tourism and National Parks)

Designations:

Parc national (National park) An area designated
exclusively for the propagation, protection,
conservation and management of flora and fauna,
and for the protection of geological formations of
scientific or aesthetic value.

Totally protected, with entry and research under
strict control.

Activities prohibited include: hunting and fishing;
digging and mining of any sort or disturbance to the
soil and vegetation unless officially authorised; any
damage to fauna or flora; blockage of any river and
directly or indirectly polluting water.

Activities for which previous authorisation from the
Director General of ORTPN is necessary are: the
introduction of any zoological or botanical
specimen; low-level flying below 300m and any
travelling or camping. Written permission is
necessary for scientific research to be carried out.

Réserve spéciale (Special reserve) Also called
réserve partielle (partial reserve) or sanctuaire
(sanctuary), they can be created under this Decree
Law by Presidential Decree.

Areas for the protection of characteristic
communities of animals, or threatened plant or
animal species and the habitat essential for their
survival.

Prohibited activities are the same as those for
national parks.

Domaine de chasse (Hunting reserve) Defined as
areas set aside for conservation, management and
protection of wild animals and their habitat. Hunting
within these areas is controlled, while all other
exploitation is prohibited, and again entry is
controlled.

Prohibited activities are the same as those for
national parks, except that hunting and fishing are
permitted, and acts which damage or disturb the flora
and fauna are not forbidden..

Hunting, shooting and capture or destruction of any
animal is forbidden in a 500m band around all these
categories of protected area.

Title: Loi No. 47/1988 portant organisation
du régime forestier (Law No. 47/1988
regarding organisation of the forest system)

Date: 5 December 1988

Brief description: Provides *inter alia* for the
establishment of the Forest Service and stipulates
activities permitted within the forest domain.

Administrative authority: Ministère de
l'Agriculture, de l'Élevage et des Forêts (MINAGRI)
Service Forestière (Forest Service)

Designations:

Forêt protégée (Protected forest)

Réserve forestier intégral (Integral forest reserve)
An area for the protection of the flora and fauna, in
which no cutting is permitted except in the interest
of protected plants.

Activities prohibited include any act which would
impede the conservation of flora and fauna,
particularly hunting and fishing, or collecting of
animals, plants or minerals.

Scientific studies are allowed by Ministerial permit.

**Zone de protection forestière (Forest protection
zone)** An area for the conservation of fauna, flora,
soil, water systems, and ecology in general. The
decree classifying each area states those activities
which are prohibited in each case, because of the
particular protection aims concerned.

**Zone de repeuplement d'essences autochtones
(Zone of restocking of indigenous species)** An
area for the preservation of the woody flora of
Rwanda

Only indigenous species may be used for replanting.

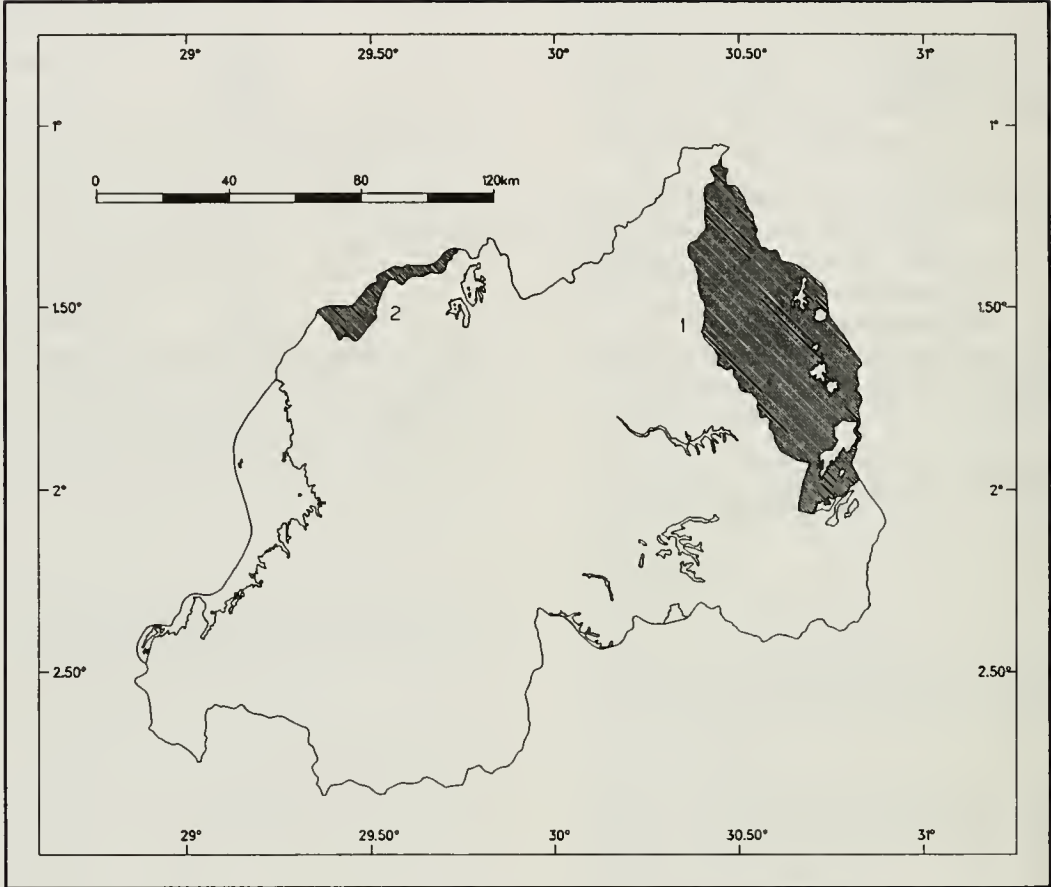
Bandes sur les routes (Wooded road borders) A 15m border along national roads is assigned to the control of the state forest domain to be wooded, unless technically impossible.

These areas are established by decree and have a management plan, giving consideration to the special conditions of this type of forestry.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Akagera	II	312,000	1934
2	Volcans	II	15,000	1929
	<i>Hunting Reserve</i>			
3	Mutara	VI	30,000	
	<i>Biosphere Reserve</i>			
	Parc national des Volcans	IX	15,065	1983



Protected Areas of Rwanda

DEMOCRATIC REPUBLIC OF SAO TOME AND PRINCIPE

Area 960 sq. km

Population 0.1 million (1990)

Natural increase: 2.7% per annum

Economic Indicators

GDP: US\$ 385 (1987)

GNP: US\$ 280 (1988)

Policy and Legislation Formerly a Portuguese colony, the islands became independent on 12 July 1975, a new constitution being approved on 12 December 1975. Portuguese colonial law relating to forestry and wildlife conservation was replaced, in effect, by Decree-Law 5/79 (Decreto-Lei 5/79) (RDSTP Diario 10 March 1979) which established the Department of Agriculture and Forestry (Direcção de Agricultura e Florestas) within the then Ministry of Agriculture and Fisheries (Ministerio de Agricultura e Pescas). However, regulations proposed under this authority do not appear to have been enacted yet (IUCN, 1989; Jones and Burlison, 1988).

Legislation on the conservation and exploitation of forests, the creation of protected areas, and the protection and management of fauna and wild flora has not yet been passed. This legislation needs to be established urgently (IUCN, 1989).

A comprehensive proposal for a coherent body of forestry law has been drawn up by Leite-Fischer (1985). It makes a distinction between "protection" forest and "production" forest. The former is subdivided into totally and partially protected forests. In totally protected forest, all tree felling is prohibited. This category includes forest bordering rivers, high altitude forest, forest of exceptional attractiveness or having a historic or scientific value, as well as forest proposed for protection of flora and fauna. Partially protected forest is that in which exploitation must be carried out with particular care to avoid damage to the environment.

International Activities Sao Tome and Principe is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) nor does it participate in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). No sites are inscribed under the Unesco Man and the Biosphere (MAB) programme. It is one of the few African countries not to be party to the 1968 (Algiers) African Convention of Nature and Natural Resources.

Administration and Management The present Ministry of Agriculture and Fisheries has established a Commission for Forest Coordination (Comissao de Coordenação Florestal) of three members, who are responsible for supervising all land within the forest sector, and for promoting the creation of a National Forest Service. This commission is responsible, amongst

other things, for the preparation of necessary legislation for the management of forests (IUCN, 1989).

Sao Tome and Principe has been the focus of an ongoing International Council for Bird Preservation (ICBP) programme, funded partly by the EEC (Harrison and Steele, 1989; Jones and Burlison, 1988; Jones and Tye, 1988; Jones *et al.*, 1991).

A local non-governmental organisation, the Society of the Friends of Nature (Associação dos Amigos da Natureza) has been established, and is awaiting official government statute. Its aims are to promote the ideas of habitat conservation, resource management and sustainable development, to undertake a range of conservation awareness activities, and to establish a wide-ranging public membership (Harrison and Steele, 1989).

The Ministry of Agriculture and Fisheries has not had the resources to carry out site inspections or assume a policing role, and while little or no damage has been done to the remaining natural forests so far, there has clearly been some abuse elsewhere of the safeguards to forest exploitation (Jones and Burlison, 1988).

Systems Reviews The main islands of Sao Tome and Principe comprise the middle pair of the chain of four islands that bisect the Gulf of Guinea. These four islands form the southern part of the Cameroon Line of Tertiary to Recent volcanoes, which also includes, on the mainland to the north, the mountains Cameroon, Manengouba and Oku and the volcanoes of Adamawa. From north to south the islands are Bioko (formerly Fernando Po), Principe, Sao Tome and Pagalu (formerly Annobon, now part of Equatorial Guinea). The islands comprising the Republic of Sao Tome and Principe are mountainous, reaching a height of 2,024m on Sao Tome (Jones and Tye, 1988).

Original cover was almost exclusively lowland rain forest, up to approximately 800m, with submontane evergreen forest and mist forest higher up. The forests' biological diversity is greatly enhanced by the high levels of endemism found in both the flora and fauna as a result of their long evolution in isolation from the African mainland (Jones and Burlison, 1988). The islands have floristic affinities with neighbouring Pagalu and Bioko and also with the countries of the African mainland round the Gulf of Guinea. In terms of their conservation value for birds alone (the most numerous and important group of terrestrial vertebrates), the islands rank second in importance among a list of 75 forests in the whole of Africa (Collar and Stuart, 1988; Jones and Tye, 1988).

On both islands, more than one-third of the land is still covered by untouched forest. This is due to the very broken terrain and precipitous slopes, which together

result in the forests being unexploitable economically. Small areas of mangroves occur around the coast (Jones and Burlison, 1988).

Much of the lower altitude forest was destroyed by the first colonists who arrived during the 1480s and began cultivating sugar cane. Sugar cane production declined during the 17th century, but more forest destruction up to 1,200m occurred following the introduction of coffee and development of coffee plantations in 1800, followed later by cocoa plantations. Between 1908 and 1919 Sao Tome was the world's largest cocoa producer (Jones and Tye, 1988). Since independence in 1975, many plantations have reverted to secondary regrowth. The changes have been greatest in former cocoa and coffee plantations; least affected have been those of coconut. There have been few recent agricultural developments on any large scale. Due to the intense agricultural activity, by the time the islands were first scientifically investigated, a very large proportion of the lowland forest and, presumably, its associated fauna had already been destroyed (Jones and Tye, 1988). Apart from their conservation value, forest resources are crucial to the islands' economy, both directly by supplying timber for construction and fuelwood for domestic and industrial use (especially for drying the cocoa crop, the republic's main export), and indirectly by protecting water-catchments from catastrophic erosion under the islands' high rainfall (Jones and Burlison, 1988).

There are no legally gazetted protected areas in the republic. However, proposals exist (BDPA, 1985; Interforest, 1990) for the establishment of completely protected ecological zones (zonas ecologicas) at higher altitudes and on very steep slopes. The ecological zone on Sao Tome covers approximately 245 sq. km; that on Principe covers approximately 45 sq. km. Both areas comprise undisturbed lowland and montane rain forest, with a closed canopy except on the steepest slopes, and small scattered areas of shrubs and thickets (Jones *et al.*, 1991).

Plans for the development of conservation education and training on the islands are outlined by Harrison and Steele (1989).

Recommendations to establish a protected area system are given in an ICBP report, which followed a joint Sao Tome government/ICBP survey project (Jones and Tye, 1988). These recommendations include establishing legislation which clearly identifies the boundaries of the most important or core forest areas with the legal status of a national park or its equivalent, and that the remaining forests outside such core areas should constitute buffer zones, where selective logging can be carried out. A forest inventory was published in 1990 (Interforest, 1990). They recommend that a new aerial and ground survey of forest resources should be written

into the government's development plans. Establishment of reserves to protect remaining lowland and montane forests is also recommended by MacKinnon and MacKinnon (1986) and IUCN (1987).

Addresses

Ministry of Cooperation, Sao Tome
Ministry of Agriculture and Fisheries, Sao Tome
Comissao de Coordenação Florestal, Direcção de Estudos e Planeamento, Ministerio da Agricultura e Pescas, CP 47, São Tomé

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SENEGAL

Area 196,720 sq. km

Population 7.4 million (1990)
Natural increase: 2.7% per annum

Economic Indicators
GDP: US\$ 680 per capita (1987)
GNP: US\$ 630 per capita (1988)

Policy and Legislation The first national park was created in 1925 whilst the country was under French colonial rule. Forest legislation dates back to 1935, with regulations concerning forest exploitation.

The principal pieces of conservation legislation now in force, which define protected areas, were produced after Senegal obtained independence in 1960 (Bissio, 1989). These are: the Forest Code (regulations) 1965, Decree No. 65-078 (Code forestier, partie réglementaire, 1965, décret no. 65-078); the Hunting and Wildlife Protection Code (regulations) 1986, Decree No. 86-844 (Code de la chasse et de la protection de la faune, partie législative, 1986, Loi no. 86-844), and the Forest Code (legislations) 1974, Law No. 74-46 (Code forestier, partie législative, 1974 Loi no. 74-46) (see Annex).

The Forest Code (regulations) defines classified forests, reforestation or restoration areas, national parks, strict nature reserves and special reserves, and provides, amongst other things, for the classification and declassification of classified forests, and for the administration of protected areas. The Forest Code (legislative part) puts extra restrictions on activities permitted in classified forests, and also provides for the administration of protected areas. The Hunting and Wildlife Protection Code (regulations) makes further provisions for national parks, strict nature reserves and special reserves, as well as for other categories of protected area, namely faunal reserves and hunting zones. The Hunting and Wildlife Protection Code (legislations) 1986, Law No. 86-04 (Code de la chasse et de la protection de la faune, partie législative, 1986, Loi No. 86-04) provides for the responsibilities of officers of the Department of Water, Forests and Wildlife, of the National Parks Office and police officers in regulating hunting and in protecting wildlife throughout the country.

A National Parks Bureau was created on 22 July 1969 by Presidential Decree No. 69-858 and subsequently upgraded to the status of National Parks Directorate in April 1973, under the authority of the Prime Minister and under the effective control of the Secretary General of the government. Presidential Decree No. 69-858 of July 1969 made the National Parks Office responsible for all parks, under the Minister for Nature Protection. Each national park is established by Presidential decree and has its own set of rules and regulations.

Legislation regarding protected areas is reviewed by Saussay (1981).

International Activities Senegal became party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 13 February 1976, under which two sites have been inscribed. The country has participated in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) since 11 July 1977, and four sites have been listed. Three sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Senegal has ratified the 1968 African Convention on the Conservation of Nature and Natural Resources, which provides definitions of strict nature reserves, national parks and special reserves.

In 1987, Senegal became the first African country to accede to the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), which is of particular importance to migratory birds.

Establishment of an international Senegambien park on the border with the Gambia has been proposed by both countries since 1980.

Administration and Management The Department of Water, Forests and Wildlife, the National Parks Service and the police are responsible for enforcing regulations protecting wildlife throughout the country. Penalties for any infractions against this and other laws are stipulated in the Hunting and Wildlife Protection Code (Legislative Part). The Department of Water, Forests and Wildlife is responsible for the management of the forest domain, which includes commercial forests and protected areas: classified forests; reforestation or restoration areas; national parks; strict nature reserves and special reserves. Eight regional commissions for soil conservation (each comprising nine regional and central government officials), established under the Forest Code (regulations), are responsible, within specific constraints, for the classification and declassification of classified forests. The regional commissions report to a national commission, comprising 11 government officials.

The Forest Code (legislations) provides for the powers of the Water and Forest Authority (Agents des eaux et forêts) and the police, in protecting: areas defined by decree; nationally owned land with artificial or natural woodland; public places with plantations for protection, or improvement of the environment and private property planted with forest species.

Since it was created in 1969, the National Parks Directorate has been the responsibility first of the Water, Forests and Wildlife Secretariat, then the General

Delegation of Tourism, then of the Secretary General of the Government and, since 3 April 1983, of the Ministry for the Protection of Nature. The National Parks Directorate is responsible for coordination, management and scientific research in national parks. Promotion of tourism within national parks is a particular responsibility of the National Parks Directorate, aided by the Ministry of Tourism. Tourism is seen as an invaluable way of safeguarding natural resources whilst at the same time aiding economic development. Scientific research is becoming more important with efforts being made to reintroduce animals to the park which are currently extinct or very rare.

The National Parks Service, incorporated within the National Parks Directorate, is primarily responsible for the protection of wildlife within national parks. Its functions in a similar manner to a paramilitary organisation, with a hierarchy of personnel, including well-trained, armed guards (Statute Law No. 79-33, 24 January 1979). The National Parks Service also organises village communities to combat poaching and to act as firefighters (Anon., n.d.). A five-year action plan for Service outlines its general goals and provides specific plans for each park or reserve under its control (Anon., n.d.).

The ivory trade was prohibited in 1982, and poaching has been taken very seriously. Anti-poaching measures include: poaching being taken as a capital offence; the imposition of jail sentences of up to 10 years and large fines (Dupuy, 1982). Heavy fines or jail sentences of up to five years are also imposed for illegal felling (Forest Code (legislations)) (see Annex).

A national conservation strategy has been produced in collaboration with IUCN (Journault and Burdock, 1983). This includes summaries of workshops discussing, amongst other things, the activities of the National Parks Directorate and the Water and Forests Directorate. Conservation education has been organised by the National Parks Directorate since 1977, aided by IUCN/WWF, with the production of films, books and a record of animal noises. Seven "Amis de la Nature" clubs, a mobile education unit and "Clubs jeunes-nature" for children, have been established, under the guidance of the National Parks Service, to explain the need to conserve and protect nature and the reasons for national parks (Diom, 1981; Dupuy, 1982).

The World Wide Fund for Nature (WWF) is currently involved in two projects in the country. One of these concerns assisting the National Parks Department in the preparation of a comprehensive management plan for Parc National des Oiseaux du Djoudj to provide a clear basis for future national and international investments in the management of the park. The second project aims to identify the social and economic requirements for local involvement in forest management projects (WWF, 1991).

Protection and management of existing protected areas is generally good, and Senegalese parks are now amongst the most heavily guarded in the world (Dupuy, 1982; Norton-Griffiths and Rydén, 1989; Sournia and Dupuy, 1990).

Systems Reviews Lying on the west coast of Africa, Senegal is almost divided into two parts by The Gambia. The country is generally flat or gently rolling, with hills above 100m found only in the south-east and the extreme west (Sournia and Dupuy, 1990). The topsoil is very thin, easily eroded by wind and rain (Journault and Burdock, 1983). Much of the country is covered by dry *Acacia* wooded grassland, with Sahelian deciduous bushland in the north, Sahelian woodland in the centre, and pre-Guinean lowland rain forest with derived secondary grassland in the south-west corner and along the southern border (Dupuy and Verschuren, 1977). Persistent drought since 1968 has accelerated deterioration of vegetation cover such that the Sahelian zone is in danger of becoming sub-desert (Anon., 1988; Voisin, 1983).

Major wetlands are the river systems of the Senegal, Gambia and Casamance, which flow from east to west. The Senegal River forms the northern border with Mauritania and marks the transition between the Sahara and the Sahel. It is the second largest river in West Africa, draining a watershed of 290,000 sq. km (Van den Top, 1990). Water levels in all these systems vary enormously throughout the year. In a wet year, by the end of the rainy season, the Sudan savannas and marshes are almost entirely inundated, but in May, at the end of the dry season, they resemble a semi-desert (Anon., 1990; Dupuy and Verschuren, 1977; Voisin, 1983). The most extensive mangrove tracts occur in the south of the country on the Casamance Estuary, particularly on the north bank of the river, where some tropical rain forest also occurs (Anon., 1990). The state of mangrove forests in the Casamance River delta is of great concern due to soil oversalinisation and acidification (C. Pomerleau, pers. comm., 1991). There are no coral reefs.

The less arid, west of the country, where the human population is concentrated, is farmed. Peanuts are the main cash crop, although production since 1983 has been badly affected by drought. Nomadic shepherds inhabit the drier hinterland (Bissio, 1988).

Senegal was one of the first African countries to be colonised by Europeans, and for many years wildlife was massacred. However, for a long time the government has given nature conservation high priority (Diom, 1981), so that there is now an extensive well-planned system of protected areas, which includes six national parks and five faunal reserves. The protected areas system, excluding forest reserves, currently covers over 11 % of the country and includes representative samples of the main vegetation types. This network is generally considered to be adequate (Dupuy and Verschuren, 1977; IUCN, 1983; MacKinnon and MacKinnon, 1986; Sournia and Dupuy, 1990). Effective protection of Niokolo-Koba National Park since independence (1960)

has resulted in this large park becoming one of the most important wildlife refuges in West Africa. Most of the other parks and reserves were established in the 1970s and 1980s. They include examples of all major vegetation types which were not already included in Niokolo-Koba (Dupuy, 1971; Dupuy and Verschuren, 1977). Considerable areas of relatively unmodified natural habitats with significant wildlife populations persist outside parks and reserves in some parts of the country, notably the south-western (Casamance) and eastern (Senegal Oriental) regions (Sournia and Dupuy, 1990).

Recommendations for action to improve the management of protected areas and for other conservation measures are given by MacKinnon and MacKinnon (1986), IUCN (1987) and Sournia and Dupuy (1990). These include: development of cooperative measures with Guinea to prevent cross-border poaching, including development of the protection and management of Guinea's contiguous, newly-gazetted Badiar National Park; increased staffing levels to implement greater protection and more effective management of some other areas. Promotion of public awareness of the value of parks and reserves in conserving nucleus populations of wildlife, as well as promotion of conservation and rational utilisation to ensure the continued availability of natural resources such as wildlife for the benefit of humans is also recommended.

Major threats facing the protected areas system come from the continued drought and desertification. Other problems have been mining exploration (particularly for iron in the north), the dam at Kereti and other irrigation projects. Mangroves on the Saloum delta are threatened by extension of the rice culture. Despite being taken very seriously, poaching is still a serious problem (Anon., 1990; Conde *et al.*, 1983; Dupuy, 1982; Dupuy and Verschuren, 1977).

Addresses

Service des Parcs nationaux (Le Directeur des Parcs Nationaux), Ministère de la Protection de la Nature, BP 5135, DAKAR FANN (Tel: 244221/250540)
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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title : Décrét No. 65-078 portant code forestier, partie réglementaire (Decree No. 65-078 concerning the Forest Code (regulations))

Date: 10 February 1965

Brief description: Defines five designations of forest land and provides for the establishment of commissions responsible for the classification and declassification of five categories of protected area.

Administrative authority: Service des Eaux, Forêts et Chasses (Water, Forests and Wildlife Service)

Designations:

Périmètre de réboisement ou de restauration (Reforestation or restoration area) Area denuded or insufficiently wooded where there is a risk of serious erosion such that reforestation is considered necessary for agronomic, economic or social reasons.

Réserve naturelle intégrale (Strict nature reserve) Natural habitat which needs to be conserved as an integral part of the national heritage.

Parc national (National park) Area where hunting, capturing animals or exploitation of flora, soil or subsoil is total prohibited. Where possible, public access for educational or recreational purposes is permitted.

Réserve spéciale (Special reserve) Areas in which partial or total, temporary or permanent restrictions may be necessary in certain circumstances (scientific, touristic, or climatic). For example, to control hunting, capturing of animals, exploitation of the flora, soil or subsoil and to construct buildings.

Forêt classée (Classified forest) Area of bamboo, forage trees, palms and other vegetation exploited for various products e.g. wood and fruit, but not agricultural produce.

Traditional users and rural collectives adjacent to special reserves and classified forests are permitted to exercise various rights of use without seeking formal permission, such as the right to collect dead wood, harvest wild fruit, food or medicinal plants, gums and resins, straw, honey or other traditional use are legally recognised by decree or by-law. In protected forests permission must be obtained from the head of the forest sector before rights to use wood for constructing or repairing buildings are exercised. The exercise of rights of use is strictly limited to

personal use; commercial transactions are not permitted. Needs of the state have priority; rights of use may be suspended if deemed necessary by the Forest Service. Exploitation of forest products except by virtue of rights of use is taxable.

Source: Original legislation in French

Title: Décrét No. 86-844 portant code de la chasse et de la protection de la faune, partie réglementaire (Decree No. 86-844 concerning the Hunting and Wildlife Protection Code (regulations))

Date: 14 July 1986

Brief description: Provides for the issue of hunting permits, protected areas and protection of people from dangerous animals.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service) Service des Parcs nationaux (National Parks Service)

Designations:

Réserve naturelle intégrale (Strict nature reserve) Prohibited activities include: all hunting and fishing; forest exploitation by agriculture, mining, soundings, terracing or construction; acts which damage or change the flora or fauna; any introductions of botanical or zoological species, either local or imported, wild or domesticated.

It is forbidden to: enter or circulate on the ground or in the air at low altitude; to camp or to do any scientific research without prior written authorisation from the Minister of Rural Economy.

Surveillance is confined to the Forest Service.

Parc national (National park) Access and presence of visitors is regulated. Tourists must buy a visitors permit; free entry can also be granted.

Prohibited activities include: circulation at night except along certain routes of general interest; circulation off tracks and roads open to the public; stopping during the day outside places indicated by the surveillance personnel or during the night except at agreed camping sites and hotels; and flying below 300m. Guns are permitted, but restrictions are imposed to prevent them from being used.

Special restrictions control activities in aquatic areas, including hunting, night navigation and any activity which exploits or degrades the site or resources.

These measures may only be waived by special registered authorisation from the Minister of Water and Forests, specifically for scientific purposes, or the protection of animals or humans.

Réserve spéciale (Special reserve) Protection is oriented towards economic exploitation or conservation aims. Protection measures are not generalised but are specified in the legislation for each reserve.

Réserve de faune (Faunal reserve) Any classified land which is not designated a strict nature reserve, national park or special reserve.

Hunting or capture of animals is forbidden except in certain circumstances.

Zone d'intérêt cynégétique (Hunting zone) Area where game and hunting are of major scientific or economic interest and where wildlife is likely to reach the highest level possible for scientific study and rational exploitation for tourism and hunting purposes, without having a noticeable impact on the other economic sectors.

Source: Original legislation in French

Title: Loi No. 74-46 Code forestier, partie législative (Law No. 74-46 Forest Code (legislative part))

Date: 18 July 1974

Brief description: Provides *inter alia* for the definition of classified forests and for the management of forested and other areas.

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Forêt classée (Classified forest) Activities prohibited include mining or alteration to the soil or forest without authorisation of the Minister of Water and Forests.

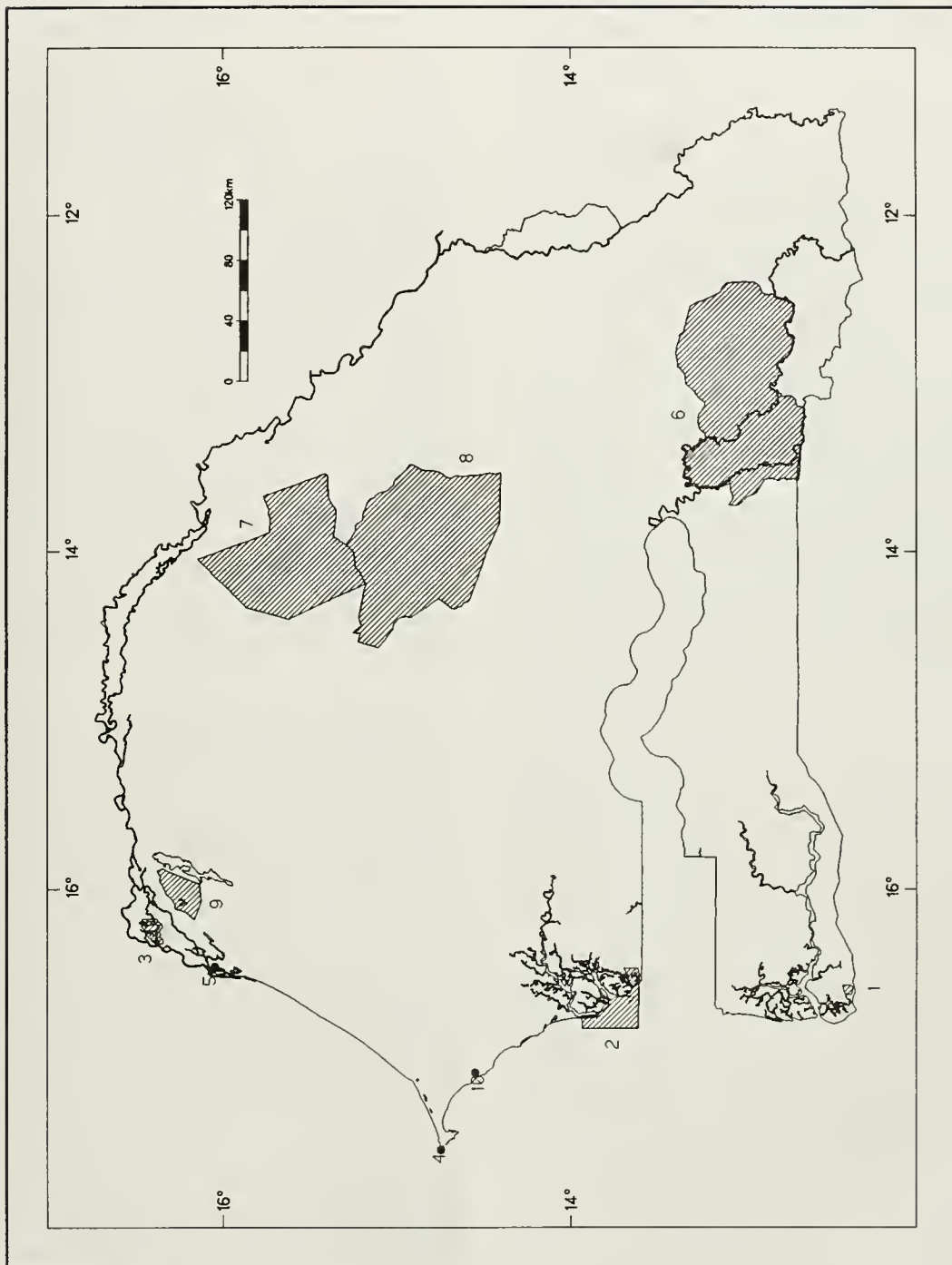
Dumping of material of any kind is prohibited.

Périmètre de réboisement ou de restauration (Reafforestation or restoration area) Dumping of material of any kind is prohibited.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Basse-Casamance	II	5,000	1970
2	Delta du Saloum	II	76,000	1976
3	Djoudj	II	16,000	1971
4	Iles de la Madeleine	II	450	1949
5	Langue de Barbarie	II	2,000	1976
6	Niokolo-Koba	II	913,000	1954
	<i>Faunal Reserves</i>			
7	Ferlo-Nord	IV	487,000	1971
8	Ferlo-Sud	IV	633,700	1972
9	Ndiael	IV	46,550	
10	Popenguine Special	IV	1,009	1986
	<i>Hunting Reserve</i>			
11	Maka-Diama	VI	60,000	
	<i>Biosphere Reserves</i>			
	Parc national du Niokolo-Koba	IX	913,000	1981
	Delta du Saloum	IX	180,000	1980
	Forêt classée de Samba Dia	IX	756	1979
	<i>Ramsar Wetlands</i>			
	Delta du Saloum	R	73,000	1984
	Djoudj	R	16,000	1977
	Gueumbeul	R	720	1986
	Bassin du Ndiael	R	10,000	1977
	<i>World Heritage Sites</i>			
	Djoudj National Bird Sanctuary	X	16,000	1981
	Niokolo-Koba National Park	X	913,000	1981



Protected Areas of Senegal

REPUBLIC OF SEYCHELLES

Area 280 sq. km

Population 100,000 (1990)

Natural increase: 1.7% per annum

Economic Indicators

GDP: US\$ 3,868 per capita (1987)

GNP: US\$ 3,800 per capita (1988)

Policy and Legislation The current basis for the network of conservation areas in the Seychelles is provided by The National Parks and Nature Conservancy Ordinance of 1969 and its various Amendments (Ordinances No. 14 of 1970 and No. 7 of 1973, Statutory Instrument (SI) No. 95 of 1975, and Act 19 of 1982), and the National Parks and Nature Conservancy (Procedure for Designation of Areas) Regulations (S.I. 110 of 1971). Section 2 of the Ordinance defines four types of protected areas, namely national park, special reserve, strict nature reserve and areas of outstanding natural beauty (see Annex). It also set up the National Parks and Nature Conservancy Commission, renamed the Seychelles National Environment Commission in 1982. Several nature reserves that had been declared under a 1961 law (the Wild Animals and Birds Protection Ordinance) were subsequently accorded the status of special reserves under the 1969 Ordinance (Government of Seychelles, 1971).

Numerous other ordinances and acts provide for the creation of protected areas for various categories of flora and fauna. These include: The Wild Animals and Birds (Protection) Ordinance of 1961, which allows for the establishment of nature reserves to specifically protect most birds, the giant land tortoise and the Seychelles pond turtle; the Turtles (Protection) Regulations of 1979, which protects all marine turtles on specified islands; the Wild Birds Protection (Nature Reserves) Regulation of 1966 (S.I. 27 of 1966), which created species-biased nature reserves on several islands; the Conservation of Marine Shells Act of 1981 (No.4 of 1981), which prohibits the taking of marine shells in designated shell reserves, subject to certain conditions; and the Marine Mammals Sanctuary Decree of 1979 (No.28 of 1979) which provides for the establishment of marine sanctuaries within Seychelles territorial waters (see Annex) (IUCN, 1986, 1987a).

The Ste Anne Marine National Park Regulations of 1973 are unusual, in that they accord residents on private land within the park the right of access by boat, and the right to carry out various lifestyle-related activities such as fishing (UNEP, 1980).

The Forest Reserves Ordinance of 1955 provides for the establishment and protection of forest reserves, but does not give a clear definition of this category; complete protection is given to woody vegetation and forest

produce on the islands. Woodlands may be protected under the Town and Country Planning Ordinance, in the "interests of amenity", and river reserves may be created under the government Land River Reserves Act (IUCN, 1987a).

In 1971, the government produced its White Paper on conservation policy stating that examples of natural habitats must be preserved for the people of the Seychelles, and that appropriate areas should be protected and developed for public recreation and enjoyment. It further mentioned several national parks that were to be given priority, and listed several areas deserving of protection (Government of Seychelles, 1971; Salm, 1978). The White Paper was replaced in 1990 by the Environmental Management Plan.

International Activities At an international level, Seychelles accepted the World Cultural and Natural Heritage Convention (World Heritage Convention) in 1980, and has two sites inscribed on the World Heritage list. Seychelles is not party to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At a regional level, Seychelles is signatory to the African Convention on Nature and Natural Resources (African Convention), which establishes several categories of protected area (IUCN, 1986; Sayer *et al.*, in press).

Administration and Management All matters relating to conservation fall under the President, although much of this devolves to the Department of the Environment, which is responsible for national parks and environmental protection through the office of the Seychelles National Environment Commission (SNEC), formerly the National Parks and Nature Conservancy Commission. The functions of SNEC include: development and review of policy matters relating to the environment; review of legislation; coordination of all activities relating to environmental conservation and management; and involvement in international environmental issues (IUCN, 1987a). SNEC consists of nine members, appointed under the 1969 Ordinance. Collectively, they are responsible for the creation and management of all protected areas apart from the islands of Aldabra, Cousin and Aride. Each protected area has a management plan, which has to be approved by the Council of Ministers. Most protected areas are manned by senior park rangers, park wardens, park rangers (grades I and II), assistant park rangers and labourers, employed by SNEC (IUCN, 1987a). In practice, SNEC is limited to the management and establishment of protected areas under the surveillance of the relevant ministries (UNEP, 1980). The management of forest resources and reserves falls under the mandate of the Forestry and Conservation Division, Ministry of

National Development, while fisheries management is the responsibility of the Ministry of Agriculture and Fisheries.

NGOs involved in conservation and protected areas management include: The Royal Society for Nature Conservation (RSNC), which controls Aride island; the International Council for Bird Preservation (ICBP), which owns and manages Cousin island; and the Seychelles Island Foundation (SIF), an international group established in 1979, which manages Aldabra Atoll as a strict nature reserve and is also involved with conservation programmes for Curieuse Island and the Vallée de Mai on Praslin (Stuart and Adams, 1990).

Systems Reviews The Seychelles consist of diverse and scattered groups of between 90 and 100 granitic and coralline islands in the western Indian Ocean just south of the equator. Their biogeographical affinities are "Seychelles, with Malagasy, African and minor Indian links on the granitic islands, and Indo-Pacific Oceanic on the coralline islands" (Stuart and Adams, 1990).

The granitic islands (numbering about 43) are rugged and often larger than the coralline ones, and are concentrated in the main island group on the Seychelles Bank; it is thought that they are ancient fragments of Gondwanaland (Salm, 1978). The largest island is Mahé, rising to 914m. Numerous other granitic islands include Praslin, Curieuse, Aride, Cousin, La Digue and Booby. They are the world's only oceanic archipelago of continental granitic origin, apart from St Paul's rocks in the South Atlantic (Diamond, 1985). The 49 or so coralline islands consist of either sandy cays on sea-level coral reefs (such as the Amirantes) or elevated limestone atolls, seldom rising more than 6m; they are vegetated by scrub and scrub-forest (Salm, 1978; Stuart and Adams, 1990).

The granitic islands do not support extensive coral reef formations, although they have been colonised by them. The *Vateria sechellarum* lowland forests of the granitic islands have largely been replaced by coconut plantations and housing, and indigenous woodland now only survives in inaccessible and upland localities. Species diversity is low, but the palm-dominated rainforest type that occurs on the drier parts of these islands is unique (Sayer *et al.*, in press). The original vegetation would have consisted of coastal formations (including coconuts and mangroves), lowland rain forest, intermediate forest, mossy montane forest and drier forest; of these, the lowland rain forest no longer survives and the other forest types survive as relics. Much of the current vegetation consists of secondary communities (White, 1983). Plantations of *Casuarina* and *Albizia* were started in the 1950s, and now cover about 9 sq. km (Sayer *et al.*, in press). Fringing mangroves occur in many sheltered bays along the east and west coasts of Mahé, as well as on the islands of Curieuse, Praslin, La Digue and Silhouette, and in the lagoons of the atolls of Aldabra and Cosmoledo. True

wetlands or swamps are rare (Salm, 1978; Stuart and Adams, 1990).

The Seychelles have been inhabited by man since 1770. Most of the islands are uninhabited, with 93% of the population living on the islands of Mahé, Praslin and La Digue. The Seychelles used to have an agro-economy based upon copra, cinnamon, vanilla and clove export; guano was also economically important. Other major exports in the past included timber and the giant tortoises *Testudo gigantea*, both of which exports dwindled away at the turn of the century. Tourism has been the backbone of the economy since the opening of the airport in 1971. Fisheries cater mainly to the local market, although there have been moves to increase its economic contribution (Salm, 1978).

The first protective measures taken were in the mid-19th century, when two areas on Praslin were purchased as Coco-de-Mer reserves (Sayer *et al.*, in press). In 1970, the "Procter Report" advised on the establishment of national parks and reserves (mainly in terrestrial areas), and a further report by Robertson in 1972 on the location and management of marine parks and reserves was used as a basis for early marine conservation action in the Seychelles (Procter, 1970; Salm, 1978). In 1982, SNEC set up sub-commissions to produce reports on various environmental issues, including national parks. These reports were used to structure the 1990 Environmental Management Plan which includes a major project with respect to the preparation and implementation of a national forest management plan. Under this plan, all forests will be surveyed and assessed with regard to erosion control, water retention, preservation of biodiversity, and for wood production and landscaping. Each forest will have its management objectives determined, and action taken to ensure that these are met (Sayer *et al.*, in press).

Currently, about 42,000ha are protected throughout the Seychelles; the largest single area is the Aldabra Atoll, a World Heritage site and the largest coral atoll in the world, covering 35,000ha. Most areas are much smaller, the bulk of them having been gazetted in the 1970s. The islands support rich biological resources such as seabird nesting colonies, coral reefs and turtle nesting beaches, and several marine national parks have been declared. The Amirantes, Farquar and Providence island groups are partly or wholly protected (Salm, 1978; Stuart and Adams, 1990).

Certain priorities to develop the protected areas network have been identified in the government White Paper, MacKinnon and MacKinnon (1986), IUCN (1987b) and Stuart and Adams (1990). Recommendations include: the creation of additional protected areas on granitic islands such as Silhouette, Frégate, Cousin and Félicité, and on the coral cay of Bird Island; an assessment of conservation requirements, particularly of seabirds, on the smaller coral islands, notably in the Amirantes group; and stronger protection afforded to marine turtle nesting

sites. In addition, ten new marine reserves have been recommended by the UNEP Regional Seas Programme.

Threats to the indigenous flora and fauna are numerous. Alien plants are spreading in many areas, and the introduced Indian house crow *Corvus splendens* is a threat to endemic birds and other species; feral goats on Aldabra are threatening endemic plants and, indirectly, the giant tortoise population. There is commercial exploitation of seabird and giant tortoise eggs and of marine turtles, and the coral reef systems are under threat from pollution, landfill and dredging. Some protected areas are under threat from development projects, such as in the case of St Anne Marine Park, and the potentially damaging environmental effects of tourism need to be assessed and monitored (Stuart and Adams, 1990). Fires are perceived as being the greatest threat to forests in the Seychelles, and there is a possible threat from potential oil-production developments (IUCN, 1987a; Sayer *et al.*, in press; Chown, 1991).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their legislation

Title: National Parks and Nature Conservancy Ordinance

Date: 1969

Brief Description: Defines four types of protected area and created the National Parks and Nature Conservancy Commission, which was later renamed the Seychelles National Environment Commission.

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

National park (including marine national park) Such areas are set aside for the propagation, protection and preservation of wildlife, or preservation of sites of aesthetic, geological, prehistoric, archaeological and/or scientific interest, for the benefit of the general public. Special mention is made of marine national parks.

Special reserve Such areas are set aside for the protection of characteristic wildlife, with all other interests subordinate to this aim.

Strict nature reserve Such areas are set aside to permit free interaction of ecological factors, without outside interference apart from that deemed necessary in safeguarding the reserve.

Area of outstanding natural beauty An area set aside due to its natural beauty or other characteristics, for the benefit, advantage and enjoyment of the general public.

Title: The Turtles (Protection) Regulations

Date: 1979

Brief Description: Turtle protection on particular islands

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

Protects all turtles on specified islands, except where the Minister has issued a permit for live capture and subsequent release for scientific purposes.

Title: The Conservation of Marine Shells Act

Date: 1981 (No.4 of 1981)

Brief Description: Provides for the establishment of shell reserves

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

Shell reserve No marine shell may be taken when such shells are on a reef, rock, bed of a lagoon or the sea or sea floor, within 400m from the low water mark (Section 3). There are a number of specifically exempted species, and the possession of explosives within such a reserve is prohibited.

Title: Wild Animals and Birds (Protection) Ordinance

Date: 1961

Brief Description: Allows for the establishment of nature reserves

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

Nature reserve Provides protective measures for most birds, giant land tortoise and Seychelles pond turtle

Title: Wild Birds Protection (Nature Reserves) Regulation

Date: 1966 (S.I. 27 Of 1966)

Brief description: Created nature reserves on the islands of Beacon (Ile Sèche), Booby (Ile aux Fous), Boudeuse, Etoile, King Ross (Lamperiaire), Les Mammeles, Cousin and Vache Marine, and Vallée de Mai (Praslin).

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

Nature reserve Emphasis is on species protection, without due regard for habitat conservation.

Title: Marine Mammals Sanctuary Decree

Date: 1979 (No. 28 of 1979)

Brief Description: Provides for the establishment of a sanctuary within territorial waters and exclusive economic zone

Administrative Authority: Seychelles National Environment Commission (Chairman)

Designations:

Sanctuary Harassment or killing of marine mammals is prohibited in such areas.

Title: Forest Reserves Ordinance

Date: 1955

Brief Description: Provides for the creation of forest reserves, and complete protection is given to woody vegetation and forest produce

Administrative Authority: Forestry and Conservation Division (Director)

Designations: *Forest reserve*

Title: Government Land River Reserves Act

Date:

Brief Description: River reserves may be created under this Act.

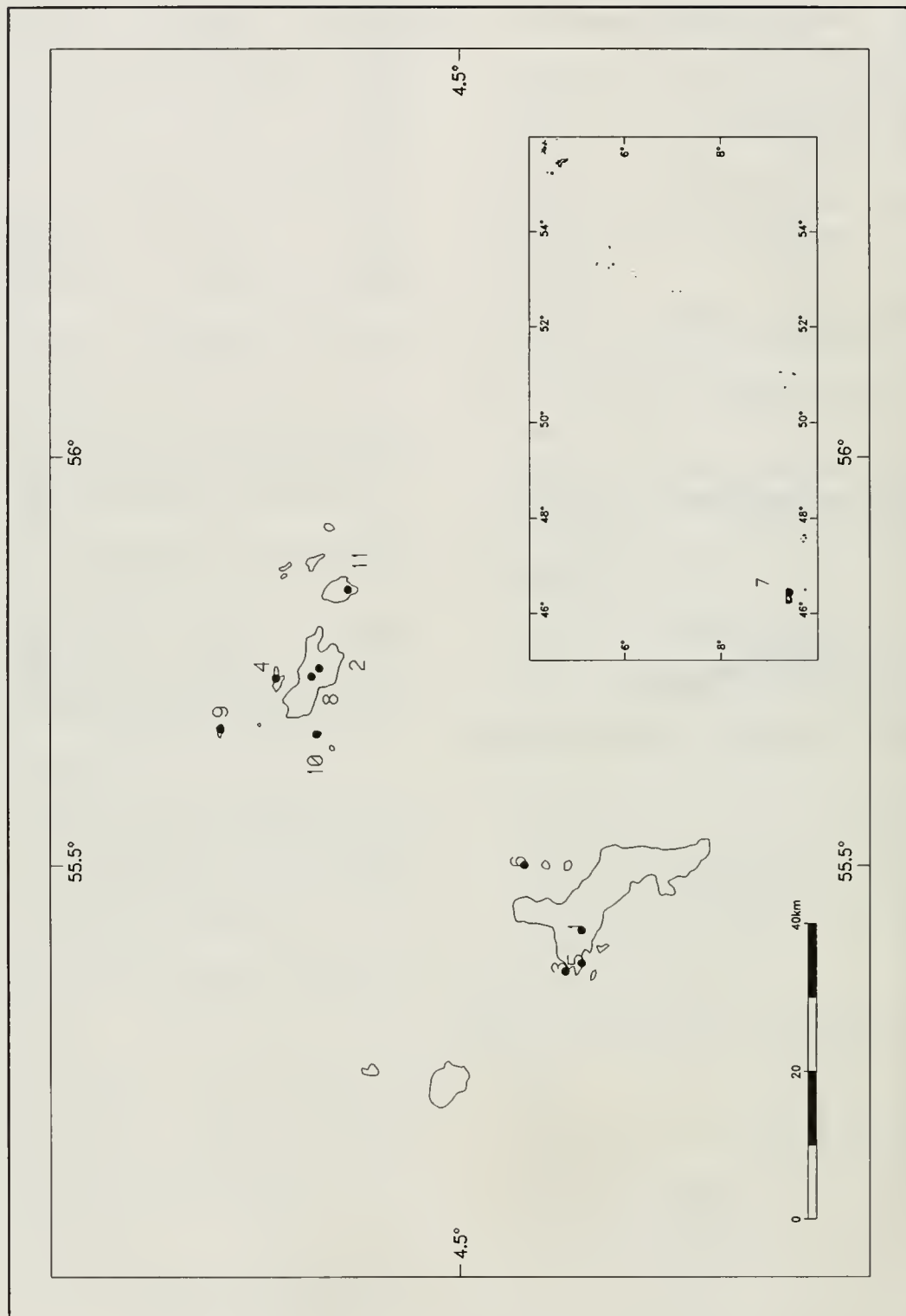
Administrative Authority:

Designations: *River Reserve*

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Morne Seychellois	VIII	3,045	1979
2	Praslin	II	675	1979
	<i>Marine National Parks</i>			
3	Baie Ternaie	II	80	1979
4	Curieuse	II	1,470	1976
5	Port Launay	II	158	1979
6	St Anne	II	1,423	1973
	<i>Strict Nature Reserve</i>			
7	Aldabra	I	35,000	1976
	<i>Nature Reserve</i>			
8	Vallee de Mai	IV	18	1966
	<i>Reserves</i>			
9	Aride Island Special	I	70	1973
10	Cousin Island Special	I	28	1975
11	La Digue Veuve	IV	8	1982
	<i>World Heritage Sites</i>			
	Aldabra Atoll	X	35,000	1982
	Vallee de Mai Nature Reserve	X	18	1983

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Seychelles

SIERRA LEONE

Area 71,740 sq. km

Population 4,151,000 (1990)

Natural increase: 2.65% per annum

Economic Indicators

GDP: US\$ 462 per capita (1987)

GNP: US\$ 240 per capita (1988)

Policy and Legislation Early conservation legislation was set out in the Ordinance for the Preservation of Wild Animals, Birds and Fish enacted in 1901 (Armstrong, 1984). Today, the primary piece of legislation dealing with wildlife conservation is the Wild Life Conservation Act No. 27, 1972, amended 1990. This Act identifies national park, strict nature reserve, game reserve, game sanctuary, controlled hunting area, and non-hunting forest reserve (see Annex). Before any protected area is constituted, the Minister must publish a notice in the *Gazette*, which specifies the situation and limits of the area proposed, and which appoints a reserve settlement officer to inquire into resettlement issues. Following acceptance of the Officer's report, the Minister may, by Order published in the *Gazette*, constitute any area of land to be a national park, strict nature reserve, game reserve, or controlled hunting area, while a Chieftom Council may, with the approval of the Minister, declare any area to be a game sanctuary. These same authorities, respectively, may declare that such protected areas shall cease to exist. The Wild Life Act also makes provision for licensing, offences and related penalties, schedules, responsibilities and duties of wildlife officers, and empowers the Minister to make regulations with respect to administration of the Act.

Forest reserves and protected forests were originally set up under the Forestry Ordinance of 1912, later amended in 1942. The Forestry Order in Council, 1960 (Cap 189), Public Notice 29 of 1962, amended the Forestry Act to incorporate timber and other licences to remove forest products from reserves on payment of fees, while the Siletti Agreement Ratification Act, 1977 and the Forest Industries Corporation Act, 1964 provided for the exploitation of forest reserves.

The Forestry Act No. 7 of 1 July 1988 replaces earlier legislation, and makes provision for the creation of the following categories: classified forest, meaning national production forest, national protection forest or community forest; and protected area (see Annex). The Act emphasises sustained forestry management; provides for the establishment of a Reforestation Fund; sets out the duties and responsibilities of the Minister, Chief Conservator and forestry officers; and outlines offences, enforcement and accompanying penalties in association with the Act. The Act requires that the Chief Conservator of Forests compile a national inventory of forest resources and prepare a national forest management plan designed to obtain the "optimum

combination of economic, social and environmental benefits" that the forests can provide. Made under the Forestry Act, are the Forestry Regulations (Public Notice No. 17) of 1 July 1990. These regulations make provision for forest administration and management, licencing, concessions, the distribution of royalties, general protection of the forest resource, offences and accompanying penalties, and provisions regarding community forests, unclassified forests and sacred bush areas (see Annex). The Regulations also specify that the Chief Conservator shall, every five years, draw up a list of areas within the country where the practice of bush fallow cultivation will lead to permanent ecological damage, therein prompting the Minister to declare such areas as protected areas. Related legislation to forestry, wildlife and the environment includes the Fisheries Act (Cap. 195) as amended and the State Lands Conservation Act (Cap. 118).

Forest policy was stated in the Five-year National Development Plan, 1970-74 and in the National Policy of 1976. Provisions of these policy statements are, *inter alia*: the acquisition, management, and protection of a forest estate; the promotion of forest research as the basis for efficient management; the utilisation of the forest estate without impairing its protective function; and the preservation and conservation of wildlife resources (Allan, 1990; Kernan, 1980). Unfortunately, the Forestry Division has been unable to fulfill its obligations, has not acquired additional land, and has been unable to adequately protect the forest estate (Allan, 1990).

A draft national environmental policy, soon to be legislation, has been prepared under the auspices of the Environmental Protection Section's National Environmental Committee. This policy has a section on forestry and wildlife which recognises the need to conserve indigenous species of wildlife and genetic diversity as part of the natural heritage, and aims to provide for their protection and management through the development of national parks and game reserves (MANRF, 1991).

In the past, forest management has been hindered by an archaic and inadequate forest law and a lack of enforcement (Allan, 1990; Teleki *et al.*, 1990). The passing of the Forestry Act, 1988 and accompanying Regulations, 1990 should help to address this situation. The distinction among the various types of wildlife sector reserves are not clear in the Wild Life Conservation Act nor in practice. A consolidation of the various categories into fewer and more distinct classes would facilitate management (Allan, 1990). New legislation to repeal the Wildlife Conservation Act, 1972 and its amendment, 1990 has been suggested (MANRF, 1991). Policy for the management of national parks and reserves also needs to be established (Allan, 1990).

International Activities To date, Sierra Leone has not become party to any of the recognised international conventions concerned with protected areas. At a regional level, Sierra Leone is signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The Ministry of Agriculture, Natural Resources and Forestry (MANRF) was formed in 1984 by the merger and reorganisation of the Ministry of Agriculture and Forestry, and the Ministry of Natural Resources (Allan, 1990). Falling under this Ministry is the Forestry Division which is responsible for administering the Forestry Act of 1988 and for managing the forest estate, while the Wildlife Conservation Branch within this Division administers the Wild Life Conservation Act of 1972, manages the national parks and wildlife sector reserves, and is responsible for the conservation of flora and fauna throughout the country (Allan, 1990).

A Forestry Department was first set up in 1910 to protect the remaining forest. As part of its mandate, the present Forestry Division is encouraged to carry out inventories and prepare detailed management plans for all classified forests. The Forestry Division has a staff headquarters manned by three professionals and eight support staff. Operational activities are decentralised to the seven regions of the country, with each region being headed by a Regional Forestry Officer who reports to both the Chief Regional Officer (CRO) of that particular region and the Chief Conservator of Forests. Forest rangers or guards are assigned to forest reserves in each region (Allan, 1990). As of 1988/89, the total Forestry Division staff comprised 15 professionals, 7 sub-professionals, 163 technical personnel, and about 900 other employees, giving a total of 1,072 (Allan, 1990). Only about half the professional positions and one-third of the sub-professional positions are currently filled. Estimated expenditure for 1988/89 totalled Le 9.88 million, 90% on wages, salary and allowances (Allan, 1990). Development of community forests is to be carried out primarily by Village Forest Associations as specified in the 1990 Regulations (see Annex).

The Wildlife Conservation Branch (WCB) is headed by a Game Superintendent who reports to the Chief Conservator of Forests. The Game Superintendent is supported by an Assistant Game Superintendent, and field staff who are located in each of the regions of the country (Allan, 1990; MANRF, 1991). Although there are positions for 145 employees, the WCB is currently functioning with only 90, most of whom are at the technical level. The Branch is also operating with a minimal budget, much of which is spent on salaries (MANRF, 1991).

The Conservation Society of Sierra Leone (CSSL) was founded in 1986 and has concentrated its efforts on conservation education. The CSSL produces a newsletter and has established a number of wildlife clubs

for children. Established in 1977, the Sierra Leone Environment and Nature Conservation Association (SLENCA) has been active in the development of the proposed Outamba-Kilimi National Park and Mamunta-Mayoso Nature Reserve and is currently involved in conservation awareness projects (MANRF, 1991). Other NGOs include: the US Peace Corps, which has a parks programme in Loma Mountains, Mamunta-Mayosa Swamp and Tiwai island; Wildlife Conservation International, a consortium including Hunter College, the University of Miami, and the University of Sierra Leone, which have done work in Tiwai Island Game Sanctuary; and, WWF, which has assisted with the establishment of Outamba-Kilimi National Park (Stuart and Adams, 1990)

Under the Tropical Forestry Action Plan for Sierra Leone, it is proposed to upgrade the Forestry Research Branch within the Forestry Division to enable it to tackle current forestry problems (Allan, 1990). Njala University College, a part of the University of Sierra Leone, had planned a programme of wildlife biology and applied ecology for people entering a career in resource management and conservation, but this has been postponed due to lack of staff and finance.

The Ministry of Agriculture, Natural Resources and Forestry has recently been reorganised and management systems are still evolving (Allan, 1990). This Ministry is hampered, among other things, by a staff who are unclear about their roles in the new organisation (Allan, 1990). Traditionally, forestry has been a neglected sector within this Ministry, with its role in land use and economic development being totally overlooked (Allan, 1990). Consequently, there has been a lack of development and operational resources, including field equipment, vehicles, qualified personnel and funds to enable the Forestry Division to function effectively insofar as the conservation and management of national forests are concerned (Allan, 1990). Further, the spread of individual holdings at the local level, increasing population and a complex land tenure system could make the setting aside of additional lands for forestry in reserves difficult (Allan, 1990). All constituted forest reserves are currently without management plans and only 27% have been inventoried to date (Allan, 1990). Wildlife, parks and environmental management are also badly neglected and the Wildlife Conservation Branch needs restructuring and strengthening (Allan, 1990). Further, it is recognised that wildlife management needs to be more closely integrated with forest management within forest reserves (Allan, 1990).

Systems Reviews Sierra Leone is bordered by Guinea to the north and east, Liberia to the south, and the Atlantic Ocean to the west. The four main physical regions are coastal plains, interior plains, plateau, and hills and mountains. The interior plains, which extend from the coastal terraces cover 43% of land area and rise to 200m in the east. An abrupt escarpment then runs from the north-west to the south-east, giving rise to the eastern plateau (300-600m), which covers 22% of the country.

The plateau is topped by Mount Bintumani, which rises to a height of 1,945m (Davies, 1987; Kernan, 1980). The biogeographic affinities are Guinea-Congolian, with Afromontane elements on higher ground, and Guinea-Congolian/Sudanian regional transition zone in the extreme north (Stuart and Adams, 1990). The three main vegetation zones are coastal mangroves, evergreen high forest in the east and drier guinea savanna in the north and north-west. Ten rivers drain from the northern uplands to the extensive mangrove swamps along the coast.

The main forest types may be summarised as: closed high forest (365,000ha); secondary forest (261,000ha); forest regrowth (bush fallow) (3,774,000ha); savanna woodland (1,619,000ha); mangrove and associated forests (286,000ha); and plantations (400ha), with forest regrowth covering some 60% of the land area (Allan, 1990). Closed forest, which once covered 60% of the country, now only survives as remnants over about 5% (Allan, 1990). Shifting cultivation, timber exploitation and cattle grazing have modified the vegetation to a large extent. About 25% of the country's area is cultivated, 31% is pasture and 29% is forest/woodland (Stuart and Adam, 1990). About 80% of the population survives by swidden agriculture and subsistence farming (MacKinnon and MacKinnon, 1986).

Wetlands include mangrove swamps, and freshwater swamp and forest grassland (Hughes and Hughes, 1991). Mangrove forests total 171,000ha at four main river estuaries: Scarcies River; Sierra Leone River; Yawri Bay; and Sherbro River (Allan, 1990). These mangroves form 4.5% of total forest area in the country (Thompson and Wood, pers. comm., 1991). Mangrove and swamp forests are suffering from deforestation due to fuelwood collection and from conversion for rice production (Hughes and Hughes, 1991; Waugh and Musa-Jambawai, 1988). The FAO Fuelwood Project and forestry extension services are currently initiating management and rehabilitation of this resource, and it is anticipated that mangroves will be legally constituted under the 1988 Forestry Act (Allan, 1990). Further, a preliminary UNEP/IUCN Fisheries and Coastal Wetlands Survey has identified a number of priority areas in the country for conservation action and proposed that a general survey of coastal ecosystems be undertaken (Thompson and Wood, pers. comm., 1991). Freshwater swamps would be afforded a degree of protection through the legal establishment of Outamba-Kilimi National Park and Mamunta-Mayosa Swamp Strict Nature Reserve (Hughes and Hughes, 1991).

As early as 1910, a system of reservation was instituted in an effort to retain some high forest areas and to guard against the total conversion to farmbrush (Allan, 1990). In 1926, Gola East and West were established, followed by Gola North in 1930 (Davies, 1987). Today, forest reserves account for about 3.9% of the country, of which 2.3% is closed forest within these reserves (Davies, 1987). Under the old classification system, the national

forest estate comprises forest reserves (294,700ha), proposed reserves (34,000ha) and protected forests (11,800ha), the latter category being restricted to road strips about 200m wide (Allan, 1990; ANRF, 1991; Kernan, 1980; Palmer, pers. comm., 1991). Apart from forest reserves, only Tiwai Island Wildlife Sanctuary and four non-hunting forest reserves (Western, Gola, Loma and Kangari) have been legally gazetted and Outamba-Kilimi National Park notified (1986), while the rest of the protected areas under the mandate of the Wildlife Conservation Branch have been proposed. When gazetted, these reserves will cover all the vegetation types in the country (MacKinnon and MacKinnon, 1986).

Certain priorities to develop the country's protected areas network have been identified in reports by Phillipson (1978), Oates (1980), and Roth and Merz (1983), as well as in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). Priority areas for conservation action include the Gola Forest reserves, the Loma Mountain Forests, Western Area Forest Reserve, Outamba-Kilimi Region, remnant semi-deciduous tropical forests in the Northern Region, freshwater areas such as lakes Sonfon, Mape and Mabesi, and montane grasslands and wetlands, including Mamunta-Mayosi Swamp, the Sherbro delta and other mangrove areas (Allan, 1990; IUCN, 1987; MacKinnon and MacKinnon, 1986). The establishment of Mogbai in Gola North and Wemago in Gola East as strict nature reserves, and the Loma Mountains as a national park have been recommended (Allan, 1990; Davies, 1987). The need to maintain forest corridors between Sierra Leone and Liberia to facilitate species migration has been recognised (Stuart and Adams, 1990).

In 1986, the government set up the Green Revolution Programme (GRP) to address the continuing drop in agricultural output. In this Programme, forestry is seen as an important component of land use and agricultural development, with the protection and management of upland watersheds and forest regrowth (bush fallow) being identified as priority areas (Allan, 1990). The Programme set new policy directions for forestry and established certain priorities which include, *inter alia*: the conservation of remaining high forest; the development of a data base for forest areas to allow the planning of management systems; a full conservation programme coordinating wildlife and ecology; development of forestry watershed management; and expansion of forestry training (Allan, 1990). To date, a lack of funding has inhibited any progress in implementing the GRP.

The Gola Rainforest Conservation Programme, a joint venture between the government, the Conservation Society of Sierra Leone, RSPB and ICPB, is looking at forest resource use by rural communities and timber companies with the aim of recommending practical conservation policies (Stuart and Adams, 1990). A first step of this project will be the preparation of management plans for the Gola Reserves.

The Tropical Forestry Action Plan for Sierra Leone (1990) identifies a number of action programmes to be initiated in the forestry sector. Among these are: an action programme for the conservation of forest resources, which will incorporate a plan to establish a national network of conservation areas; an action programme on forest inventory and management; and an action programme concerned with strengthening the Forestry Division and in restructuring the Wildlife Conservation Branch to become more fully integrated with forestry (Allan, 1990). These initiatives will be complimented by the preparation and implementation of management plans for the protected areas. Further, it has been recognised that rural development outside the reserves needs to be coordinated with forest management (Davies, 1987).

The government has recently endorsed the Elephant Conservation Plan for Sierra Leone. This plan proposes a conservation strategy for the country, having as a first priority the establishment of an effective series of protected areas (MANRF, 1991). Integrating conservation and protected area management with sustainable resource development is recognised as being important in the development of this strategy. Proposed projects within this Plan include: institutional support for the Wildlife Conservation Branch; strengthening of the Conservation Society of Sierra Leone; revision of the 1972 Wildlife Conservation Act; surveys of vegetation and large mammals in proposed reserve areas; establishing a Tiwai Island/Gola Forest Biosphere Reserve and strict nature reserves in the Gola Forests; and the development of management plans for proposed conservation areas (MANRF, 1991).

The greatest threat to the native flora and fauna is environmental degradation through uncontrolled forest clearance and agricultural expansion; in 200 years the country has lost over 97% of its primary forest. All forest reserves, including the four non-hunting reserves, are intensively hunted and are experiencing agricultural encroachment (Allan, 1990; Davies, 1987). About 1,200 people are currently residing in the proposed Outamba-Kilimi National Park (MANRF, 1991). Urban developments are also threatening the integrity of forest reserves, while uncontrolled bushfires are threatening remnant semi-deciduous tropical forests in drier northern parts of the country (Waugh and Musa-Jambawai, 1988). Diamond digging in the Loma Mountains and Gola Forest Reserves occurs and has greatly increased soil erosion (Davies, 1987).

Other Relevant Information The recent incursion by Liberian rebels has temporarily destabilised the country, resulting in interference with agriculture and poaching of wildlife (MANRF, 1991).

Addresses

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223445; Fax: 22 224439; Cables: MINAGRIC FREETOWN)

Wildlife Conservation Branch (Game Superintendent), Forestry Division, Ministry of Agriculture, Natural Resources and Forestry, Tower Hill, FREETOWN (Cables: MINAGRIC FREETOWN)

Conservation Society of Sierra Leone (CSSL) (President), Sparta Building, PO Box 258, FREETOWN (Tel: 232-22-224079)

Sierra Leone Environment and Nature Conservation Association (SLENCA) (Executive Secretary), PMB 376, FREETOWN (Tel: 22 40956)

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: The Forestry Act (Act No. 7)

Date: 1 June 1988

Brief description: To provide for the management of forest resources

Administrative authority: Forestry Division (Chief Conservator)

Designations:

Classified Forest

Upon receipt of a proposal from the Chief Conservator to create a national forest, the Minister may, by notice published in the *Gazette*, constitute any land owned or leased by the sState to be a national production or national protection forest. The Minister may revoke or modify any notice constituting a national forest where it appears to him to be in the long-term interest of the country.

The Chief Conservator must approve a forest management plan for any particular area of national forest before a forest concession will be granted. Further, and is practicable, forest management plans are to be prepared and revised for the management of areas of national forest not under concession and for community forests.

Prohibited activities in national and community forests include: cutting, burning, uprooting, damaging or destroying any tree; removing any timber or other forest produce; clearing any land; building any road or structure; taking any earth, clay, sand, gravel or stone; cultivating any crop; grazing any cattle; or conducting any forest operation except pursuant to a concession agreement, contract of sale, licence, confirmed usage right or other authority under this Act.

National production forest Means a national forest of which the primary management objective is production of forest produce.

National protection forest Means a national forest of which the primary management objective is preservation of the forest environment and protection of soil, water, flora and fauna.

Community forest The Chiefdom Council of any Chiefdom may conclude an agreement with the Chief Conservator providing for the constitution of any land as a community forest within the Chiefdom, subject to the approval of the District Officer for the District in which the land is situated. The Minister may, by notice published in the *Gazette*, constitute any state land and any land in which there is an established agreement as a community forest. A community forest agreement may be terminated or modified by mutual consent of the parties thereto.

Each agreement shall *inter alia*: describe the area included in the forest; and indicate the purpose of the forest, be it for supply of fuel, building poles, production of commercial timber, or protection of soil and water supplies.

A community forest on state land shall be managed by the Forestry Division, or subject to an agreement, by a unit of local government, community forest association, or co-operative. Community forests not on state land shall be managed by the Chiefdom Council, or subject to agreement, by a community forest association, co-operative, or the Forestry Division.

Where the Chiefdom Council requests, the Forestry Division shall prepare a management plan for any particular community forest and provide all necessary advice and assistance for the management of such areas. The Chief Conservator may also require a management plan and annual working plans to be prepared for any community forest.

The Chiefdom Council or other body responsible for managing such areas shall determine the conditions, including fees and prices, under which the forest may be utilised.

Protected area The Minister may, by notice published in the *Gazette*, declare any area to be a protected area for the purposes of the conservation of soil, water, flora or fauna. The Minister may revoke or modify a notice declaring a protected area at any time, and unless revoked, such a notice declaring a protected area shall expire after five years time.

Prohibited activities include the cutting, burning, uprooting, damaging or destroying of any vegetation

in such areas without written permission from the Chief Conservator.

Source: Original legislation

Title: The Forestry Regulations (Public Notice No. 17)

Date: 1 July 1990

Brief description: To provide for the management of forest resources

Administrative authority: Forestry Division (Chief Conservator)

Designations:

Community forest Development of community forests is to be carried out primarily by Village Forest Associations.

Sacred bush area No tree or vegetation is to be removed from areas abandoned as sacred bush except under the authority of a clearance licence issued by the Chief Conservator.

Unclassified forest Means forest that is not part of the government estate and is neither a community forest, game sanctuary or declared area.

Before any unclassified forest area under private ownership is brought under industrial exploitation or any other form of forest exploitation, a management plan must be prepared by the owners or custodians for approval by the Chief Conservator.

Source: Original legislation

Title: Wild Life Conservation Act (No. 27)

Date: 1972, amended 1990

Brief description: Provides for the conservation of wildlife and the creation of protected areas

Administrative authority: Wildlife Conservation Branch (Game Superintendent)

Designations:

National park Such areas are maintained for the purposes of propagating, conserving and managing wild animal and plant life, and for protecting sites, landscapes, or geological formations of scientific or aesthetic value for the benefit and enjoyment of the public.

Unless authorised to do so, prohibited activities in national parks, strict natural reserves and game reserves include: hunting or capturing of any wild animal; the taking of any forest produce as defined in the Forestry Act; the damaging of any trees; the setting of fires; the trespassing of any domestic animal; conducting any act connected with forestry, agriculture, mining, or construction which would alter the configuration of the soil or the character of the vegetation; injuring or disturbing the flora or fauna; traversing, camping or residing in, or erecting any building; introducing any species of flora or fauna; and constructing any dam or weir, or otherwise obstructing the channel of any river or stream.

The area one mile in width surrounding national parks and strict natural reserves is to be an intermediate zone within which no person shall hunt, kill or capture any animals except with the written permission of the Chief Conservator of Forests.

Strict natural reserve Kept and maintained for the purpose of protecting the land, fauna and flora therein from any kind of injury or destruction.

Represent the highest level of protection, in which no hunting is allowed, entry is restricted to scientific purposes, and they may be set up within other protected areas such as forest reserves and national parks.

Game reserve see above

Game sanctuary To protect a unique environment or ecosystem, usually at the request of a Chieftom Authority.

All forms of land use are permitted, but the trapping and hunting of wildlife are prohibited in such areas.

Management is the responsibility of the local community and scientists working in the sanctuary.

Controlled hunting area No person shall hunt or capture any animal in such areas except: in accordance with such terms and conditions as may be prescribed by regulations for that area; or where a permit has been issued by the Chief Conservator of Forests.

Non-forest hunting area No person shall hunt or capture any animal in such areas except under permit issued by the Chief Conservator of Forests.

Sources: Original legislation; Allan, 1990; MANRF, 1991

SUMMARY OF PROTECTED AREAS

Map ref.	<i>National/international designations</i> Name of area	IUCN management category	Area (ha)	Year notified
1	<i>National Park</i> Outamba-Kilimi*	IV	80,813	1986
2	<i>Game Reserve</i> Tiwai Island	IV	1,200	1987
	<i>Non-hunting Forest Reserves</i>			
10	Kangari Hills	VI	8,573	1924
12	Loma Mountains	VI	33,201	1952
15	Sankan Biriwa (Tingi Hills)	VI	11,885	1947
20	Western Area	VI	17,688	1916

*Notified, but not legally gazetted

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Sierra Leone

SOMALIA

Area 637,660 sq. km

Population 7,497,000 (1990)

Natural increase: 2.37% per annum

Economic Indicators

GDP: US\$ 235 per capita (1987)

GNP: US\$ 170 per capita (1988)

Policy and Legislation Law No. 15 on Fauna (Hunting) and Forest Conservation was decreed on 25 January 1969 and amended by laws in 1970 (Law No. 68), 1971 (Laws Nos. 34 and 65), 1975 (Law No. 79), 1978 (Law No. 43), and 1979 (Laws Nos. 3 and 32). It covers forest conservation, grazing, and mining, as well as establishment and control of protected areas, with the object of protecting natural resources from degradation by regulating their management (Salah, 1983). Types of area defined in the legislation are game reserve, controlled area, partial game reserve, forest reserve, and grazing reserve (see Annex). The law also makes provision for permit fees, prohibited game, closed seasons, game licences, trophies, offences and accompanying penalties, powers and responsibilities of the Minister and forest officers; the instatement of honorary game rangers; and the protection of trees on unreserved land (see Annex). Nothing in the law affects mining claims, prospecting rights or exclusive prospecting licences which have been registered, issued or granted under the provisions of the law related to mining, prospecting and exploration. The law repeals and replaces the forest regulations of 25 November 1954 under the Italian Trusteeship Administration, which allowed for the subdivision of woodlands into various categories (free (open); reserved; and reserved woodlands with forbidden grazing); Game Ordinance No. 18, 1955, of the Northern Regions; and any other laws inconsistent with this law. A complete ban on the hunting of wildlife was legislated by Law No. 65 of 13 October 1977.

While there is no legislation for the establishment and management of marine protected areas *per se*, the 1984 Tourism Act has provisions for the protection, preservation and utilisation of historic, cultural and artisanal resources; the protection and preservation of ecology; and strict urban and regional planning for zones of touristic interest to include game parks, land and sea parks, sanctuaries, and the like (UNEP *et al.*, 1987). Marine fisheries legislation is covered in the Maritime Code (Legislative Decree No. 1 of 31 February 1959) as amended by Decree Law No. 7 of 1 November 1966 and Law No. 3 of 7 January 1967. Article 70 allows for the prohibition of fishing in certain areas.

Complimenting existing legislation, the Five-year Development Programme 1974-1978 contained a statement of policy on forestry and wildlife where the preservation of forest and wildlife resources for the

benefit of the Somalian people, and the creation of protected areas was emphasised (FAO, 1977). The Five-Year Development Plan 1982-1986 contained a policy statement setting the objectives of forestry as: to strengthen the Forestry Department; to complete the inventory and mapping of forest resources; to prepare management plans combining production and conservation; and to amend the forest law, among others (Bowen and Bird, 1988).

The Mogadishu Manifesto on the Conservation of Wildlife, 1989 embodies current government policy which forms the basis for all future development projects and activities in various fields pertaining to Somali wildlife. The Manifesto states, *inter alia*: that wildlife projects are among those to receive first priority in the country; that immediate action be taken to set up faunal and floral protected areas, including Mogadishu Wildlife Park, and to complete those already in progress such as Bush Bush and Alifuuto; that the wildlife Department is to be strengthened through the enactment of new wildlife legislation; that special reserves are to be established to protect elephants; that a Wildlife Conservation Day is to be proclaimed; and that public awareness and conservation education are to be promoted. Arising from this Manifesto, a new wildlife law and accompanying regulations have been drafted (see below).

Over the past two decades, a number of attempts have been made to revise protected areas legislation. Following an earlier draft, Abel (1976) prepared a Wildlife Conservation and National Parks Law which made provisions for the creation and management of national parks, wildlife reserves and controlled areas. In 1983, legislation, modelled on the Wildlife (Conservation Management) Act 1977 of Kenya, was drafted to allow for the easy establishment of various kinds of reserves so that all aspects of Somali wildlife could be protected. National parks, wildlife reserves, special reserves, turtle reserves, forest reserves, permanent grazing reserves, and temporary grazing reserves were considered necessary in the development of the protected areas network (Simonetta and Simonetta, 1983). Following this, Toth and Qabile (1984) made further recommendations for revision of wildlife conservation legislation and protected areas management. The most recently proposed draft legislation is the Wildlife Law, 1990 and the accompanying Wildlife Regulations (FAO, 1990). Protected areas defined in this law include national reserve, national park, national conservation area, trans-frontier wildlife protection area, provisional national reserve, and provisional national park (see Annex). The procedure involved in notification and gazettement of protected areas is outlined, and the law makes provisions for: the creation of the Somali Wildlife Service and Wildlife Fund; powers and responsibilities of the Minister, Director and supporting wildlife

officers; protection and trade in animals; wildlife schedules; and offences and accompanying penalties in connection with wildlife conservation and protected areas (FAO, 1990). The enactment of this recently proposed legislation depends largely on stability returning to the country. It has been recommended that new forestry legislation compatible with the draft wildlife law also be prepared (Gaiger, pers. comm., 1991).

The need for new and comprehensive legislation covering all aspects of forestry and wildlife management has been recognised for some time by authorities of the National Range Agency (Simonetta and Simonetta, 1983). Present legislation is obsolete, does not cater for the establishment of national parks, and enforcement is either inadequate or non-existent in preventing the over-utilisation of Somalia's natural resources (FAO, 1977; Simonetta and Simonetta, 1983; Stuart and Adams, 1990). Boundaries of protected areas either need to be established in the first instance or redrawn to reflect current land use and settlement patterns (Madgwick, 1989). Present legislation does not eliminate all user rights within forest reserves, thereby inducing the use of such areas for traditional grazing (Preto, 1987). The need for a formal mechanism to establish, manage and administer marine and coastal protected areas has been recognised, as has the need for a national conservation strategy and systems plan to guide conservation activities and the establishment of a protected areas network (Kingdon, 1990; MacKinnon and MacKinnon, 1986; UNEP *et al.*, 1987).

International Activities At an international level, Somalia is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and does not participate in the Unesco Man and the Biosphere (MAB) Programme. At the regional level, Somalia is signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area; has signed the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region; has signed the Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region; and is signatory to the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (UNEP/IUCN, 1988; UNEP *et al.*, 1987).

Administration and Management Falling within the Ministry of Livestock, Forestry and Range are two organisations responsible for terrestrial environmental matters: the Central Rangelands Development Project (CRDP) which has jurisdiction in the central region of the country, and the National Range Agency (NRA) which is responsible for the southern and northern regions (NRA, 1991). The NRA, established in 1976 as part of the Drought Rehabilitation Programme, is

responsible for the conservation and development of range, forest and wildlife resources in the best interests of the Somalian people. In line with the Five-Year Development Plan of 1982-1986, it has adopted, *inter alia*, the following further objectives: to manage the forest and range resources to provide for the preservation and continued existence of country's flora and fauna; to undertake vegetative and animal resources inventories; to implement approved resource management plans for the forests and rangelands; and to prevent the destruction of productive forest and rangeland through encroaching desertification (Bowen and Bird, 1988). The NRA is headed by a general manager who has eight directors of departments under his control. These departments are: Transport, World Food Programme, Training and Planning; Administration and Finance, Wildlife, Range Management, Forestry, and the Anti-desertification Unit. In addition, 18 regional directors, who are responsible for forestry, range and wildlife management within their areas receive instructions from all department heads (Bowen and Bird, 1988).

By virtue of Law No. 34 of 1971, the National Parks Agency, a self-governing body reporting to the President was created. Later, this Agency was placed under the Ministry of Tourism, and in 1975, under the jurisdiction of the Ministry of Livestock, Forestry & Range. In 1977, the President issued a directive that the Agency become a department known as the Wildlife Department within the Ministry of Livestock, Forestry and Range. The Department consists of a Director, six to eight graduate professional officers and a number of technical and administrative staff (NRA, 1991). The Director of Wildlife oversees law enforcement, project planning and development, licence and exporting activities, and the creation and management of national parks and conservation areas in the country. Within the Department are found an Anti-Poaching Unit and staff who look after surveys and monitoring, public awareness and wildlife education, and reserve management (NRA, 1991). The Ministry for Jubba Valley Development (MJVD) and the NRA are jointly responsible for the administration and management of all protected areas in the Middle Jubba (Madgwick *et al.*, 1986).

The Forestry Department, within the Ministry of Livestock, Forestry and Range is responsible for the management of the forest estate, while the Ministry of Tourism was established for the development of tourism along the coast. This latter Ministry has plans to develop tourism near Lag Badana-Bushbush National Park and the development is to include parts of the national park, offshore islands and coral reefs (UNEP/IUCN, 1988).

A government/FAO/FINNIDA initiative currently aims to strengthen the Forestry Department with respect to improved forestry, range, and wildlife management. An extensive training component is part of this project. ODA is providing assistance to the Forest, Range and Wildlife Institute for institutional management, curriculum development, training and education (Stuart and Adams, 1990). Training in protected areas

management is also provided by the Somali Forestry and Wildlife College. It has been recommended that a national programme for training personnel in marine conservation should be formulated (UNEP/IUCN, 1988).

The Somali Ecological Society, a voluntary, local organisation founded in 1983, is concerned with the preservation of natural habitats in the country and with increasing national conservation awareness (Schels, 1990). The Society is currently managing Balcad Nature Reserve, therein protecting a small patch of riverine forest along the Shabelle River (Madgwick, 1989). It is also involved in steering a project aimed at making Shoonto and Barako Madow functioning nature reserves (Madgwick, 1989). The Wildlife Rescue, Research and Monitoring Centre (WRRMC) is of value in providing a database management service (Bauer, 1986).

Draft legislation of 1990 has proposed the formation of the Somali Wildlife Service (FAO, 1990). The responsibilities of this Service would include, *inter alia*: advising the Minister on the formulation of conservation policies and the establishment of protected areas; the administration of protected areas, including the preparation and implementation of management plans; controlling the exploitation of wildlife resources; and, liaising with competent authorities in neighbouring countries. The Service would be headed by a Director, and a Wildlife Protection Unit, responsible for safeguarding protected areas and protected animals, would be created within the Service (FAO, 1990). It has also been suggested that a consultative committee be established which would act as an environmental watch dog and assist in the formulation of integrated resource protection and exploitation policies (Gaiger, pers. comm., 1991).

Management and protection of critical sites is poor to non-existent (MacKinnon and MacKinnon, 1986). Constraints facing the Department of Wildlife are lack of funds and equipment, a weak infrastructure, continued loss of trained personnel and an unclear programme framework (Toth and Qabile, 1984). Many conservation areas and "protected forests" exist on paper only and are not under active management and control (Simonetta and Simonetta, 1983; UNEP *et al.*, 1987). Currently, little is known about the status and importance of a number of ecosystems including lowland forests (Douthwaite, 1987).

Systems Reviews Somalia is bordered on the west by Djibouti and Ethiopia, and on the south by Kenya, while the Indian Ocean and Gulf of Aden enclose the east and north sides of the country. Central and southern parts of the country are mostly plain and plateau, whereas the north is mountainous with some peaks reaching 2,000m (Leslie, 1989).

The biogeographic affinities are predominantly Somali-Masai, with Afromontane elements in the northern mountains, and Zanzibar-Inhambane Regional

Mosaic in the extreme south (Stuart and Adams, 1990). The vegetation is mainly dry deciduous bushland and thicket, with semi-desert grassland and deciduous shrubland in the north and along much of the coast. Montane bushland and *Juniperus* forest is found in the northern mountains, with some coastal semi-evergreen bushland in the south, as well as riverine forest patches on the lower Jubba River (Stuart and Adams, 1990). Closed forest cover occupies about 2.4% of the country (MacKinnon and MacKinnon, 1986).

Land use is such that 2% is cultivated, 45% is pasture and 14% is forest/woodland (Stuart and Adams, 1990). About 75% of the population lives in rural areas, and in 1980, 76% of the labour force worked in agriculture (Leslie, 1989; MacKinnon and MacKinnon, 1986).

In recent years, the government has become aware of the fragility of the country's ecosystems, and in particular the hazard of desertification. There has been an increase in the occurrence and scale of such symptoms of desertification as total depletion of forest or pasture cover, soil erosion, instability of irrigated land, and formation of sand dunes. These are largely due to successive droughts and increased pressure of human and livestock populations. In recent five-year development plans, the government has emphasised measures to halt and reverse symptoms of desertification (Salah, 1983).

Somalia has the most extensive and least spoilt coastline on the continent, with 2,000km facing the Indian Ocean and 1,300km facing the Gulf of Aden (UNEP/IUCN, 1988). There are no coral reefs facing the Gulf of Aden due to upwellings and seasonal cold water currents (Stomme, in prep.). Although little is known about the coral fauna facing the Indian Ocean, they are likely to resemble those of Kenya (UNEP/IUCN, 1988). Currently, important coral reefs, seabird colonies and turtle nesting beaches are unprotected, and surveys of the marine and littoral resources along the coast are needed (UNEP *et al.*, 1987). It has been recommended that priority be given to surveying the coral reef/island/mangrove systems from Mogadishu south to the border with Kenya, with the possibility of establishing marine parks at the Bajuni archipelago and along the coast adjacent to the proposed Lag Badana-Bushbush National Park (IUCN, 1987; Stuart and Adams, 1990; UNEP/IUCN, 1988). In addition, the north coast from Djibouti to Raas Xaafuun and the area from Raas Xaafuun to Cadale should be surveyed (UNEP/IUCN, 1988). It has been further recommended that a national plan and action strategy be developed for marine protected areas and resources (UNEP/IUCN, 1988; Elder, in press). Threats to reefs include sand mining, removal of live coral to allow passage of vessels, and localised incidents of domestic and industrial pollution (UNEP/IUCN, 1988). Mangrove stands are constantly ravaged for firewood and construction material (Hughes and Hughes, 1991).

The two major rivers which originate in Ethiopia and pass through the south of the country are the Shabelle (Shebelle) and the Jubba which it joins in the far south to enter the Indian Ocean at Kismaayo (Stromme, in prep.). Tidal wetlands occur along the Gulf of Aden, with a few lagoons on the east coast and some deep mangrove lined inlets in the south. Permanent swamps and floodplains are associated with the Jubba and Shabelle rivers, while other permanent wetlands are found in the Nogal Valley and in a series of tugs, bullehs, pans and springs, mainly in the northern part of the country. Sizeable wetlands are devoid in the central section of the country. In making the legally designated protected areas functional, many wetlands areas would be afforded a degree of protection (Hughes and Hughes, 1991).

Prior to 1952, a small area of forest (35 sq. km) had been reserved, but the boundaries had not been demarcated (Bowen and Bird, 1988). In the mid-1950s, seven reserves were gazetted to protect *Juniperus* forests along the northern escarpment (IUCN, 1976). The Law on Fauna (Hunting) and Forest Conservation of 1969 legally established four game reserves, three controlled areas, and four partial game reserves. Between 1974-1976, the government initiated the "Strengthening of Forestry and Wildlife Management Project", which surveyed the distribution of wildlife, and advised the government on the establishment of potential national parks and game reserves in the country, especially in the areas adjoining the Jubba and Shabelle rivers (Garani, pers. comm., 1978). This was followed by a further project from 1979-1981 to reactivate wildlife conservation and development, and to develop Lag Badana-Bushbush National Park, but the project could not be implemented due to lack of funds (Bauer, 1986). Draft legislation in 1983 proposed a total of 20 protected areas including national parks, wildlife reserves and forest reserves. In addition, eleven special reserves were proposed in this legislation, eight for the protection of fish and crustacea, two for the protection of endangered plants and one, the petrified forest of Bir Dulhir, is a palaeontological site (Simonetta and Simonetta, 1983). The Somalia Research Project, conducted in 1986, was set up to provide ecological information necessary for the identification of viable forest reserves, along with a detailed strategy for their conservation (Madgwick *et al.*, 1986). From this study, recommendations arose as to the creation and management of protected areas in riverine forest of the Middle Jubba Valley (Madgwick *et al.*, 1986). Subsequently, there has been support for making Shoonto and Barako Madow functioning nature reserves (Madgwick, 1989). Currently, two World Bank projects, one based in the Alifuuto swamp area, and one in the Central Rangelands, have begun (NRA, 1991).

Of the conservation areas established and proposed since 1969, only Balcad and Alifuuto nature reserves are currently functional, while operational plans for the proposed Lag Badana-Bushbush National Park have been prepared (Chaudhuri, pers. comm., 1990). The legal establishment of all conservation areas in the

country would result in more than 8% of the total area being covered. In addition, there are 27 "protected forests" (Simonetta, pers. comm., 1987). Because of the aridity and need to control land use carefully, Somalia also has 136 grazing reserves and 16 range cooperatives covering approximately 7,200,000ha or about 11.3% of the total area (Salah, 1983). These areas were, however, established primarily to protect grazing lands and ensure secure supplies for a growing population rather than for the conservation of wildlife (MacKinnon and MacKinnon, 1986; Madgwick, 1984).

Certain priorities to develop the protected areas network have been identified by Simonetta and Simonetta (1983), Toth and Qabile (1984), in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). Of immediate importance is the establishment of a protected areas system, backed by ecological and resource-use surveys, appropriate legislation, and an appropriate personnel and training infrastructure (Stuart and Adams, 1990). Important sites identified in the dry semi-desert and savanna regions of Somalia as urgent priorities for protection include: Zeila; Las Anod-Taleh-El Chebet; Ras Hajun-Ras Gubah; El Hammure; Hobyo; Haradere-Awale; Jowhar-Warshek; Harqan-Dalandoole; Lack Dere; Far Wamo; and Lag Badana-Bushbush (Stuart and Adams, 1990). Important areas of wetland and moist savanna exist in the regions of the Shebelle and Juba rivers. Priority areas for protection in these regions include Jowhar-Warshek, Har Yiblame; Eji-Oobale; Awdhegle-Gandershe, Arbowerow; Boja Swamps, Angole Farbiddu (including riverine forest), and Lake Radidi. Two important sites in the mountains of northern Somalia are the proposed national parks at Gaan Libaah and Daalo Forest, the latter to be extended to include the northern coastline (Stuart and Adams, 1990). Gezira Lagoon is important for its bird fauna and rare plants (IUCN, 1989). The recently produced Elephant Conservation Plan for Somalia has identified a number of priority projects including the establishment of Bush Bush National Park, the production of an elephant management plan, and the promotion of wildlife resource management awareness (NRA, 1991). The delimitation of permanent forest reserves and grazing areas are further priorities (Preto, 1987).

Current multi-agency projects include: a collaborative government/FAO/UNDP project in wildlife management, which *inter alia* has been working towards improving wildlife management, applying benefits of conservation to local communities, developing wildlife legislation, and preparing a national park management plan, among others; a government/FAO/UNDP project in forestry sector support and training which has provided assistance in forestry and wildlife management, and is developing policies and legislation; and the Tropical Forestry Action Plan has recently been initiated in the country (Stuart and Adams, 1990). The World Bank's Environmental Action Plan for Somalia has established the remnant riverine forests of the Jubba valley as a priority concern (IUCN, 1990). The NRA has

been involved in a programme of establishing breeding populations of rare and/or endemic wildlife species both in the country and abroad for future repopulation of the parks and reserves when they can be afforded a degree of protection and management (MacKinnon and MacKinnon, 1986).

Somalia has been severely ravaged by security problems, droughts and the consequent human disasters in recent years. There is no organised protected area system in place, and the country's critical sites are being impoverished by a combination of droughts, burning, small scale clearance for timber and fuel, chronic overgrazing, and excessive hunting (Madgwick, 1989; Stuart and Adams, 1990). Local pressures such as mining and water resource development are putting further stress on the diminishing resources of the country (Douthwaite, 1987; Simonetta, pers. comm., 1987). Forest and grazing reserves are suffering from deforestation, unlimited grazing and settlement (Madgwick, 1984). Several protected forests have been totally cut and the riverine forests have been almost completely destroyed, with only small intact patches being found in the Jubba Valley (Madgwick, 1989; Simonetta, pers. comm., 1987).

Other Relevant Information Initiating conservation/development programmes is currently difficult due to security problems within the country (IUCN, 1990).

Addresses

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Department of Fisheries (Director), National Range Agency, Ministry of Livestock, Range and Forestry, BP 1759, MOGADISHU

British Forestry Project Somalia (Director), c/o British Embassy, BP 1036, MOGADISHU

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Law on Fauna (Hunting) and Forest Conservation (No. 15)

Date: 25 January 1969, amended 1970, 1971, 1975, 1978 and 1979

Brief description: Provides for the management of wildlife and the creation of protected areas in Somalia.

Administrative authority: National Range Agency (General Manager)

Designations:

Game reserve The hunting of all animals is prohibited, the exception being where a person is in possession of a Minister's licence. Entry and residence are regulated in such areas.

Except with written permission, prohibited activities include: the setting of any bush or grass fire; burning, injuring or removing any vegetation; and being in possession of any instrument capable of killing or capturing game animals.

Controlled area The hunting of all animals is regulated by written permission, but entry and residence are not restricted.

Except as provided by the Minister's Licence, no person shall hunt any game animal without the Game Licence for such animal and the permit for such area previously sought and obtained from the Minister.

The Minister may apply any or all of the provisions relating to game reserves to a controlled area or part thereof.

Partial game reserve The hunting of certain animals is prohibited in such areas.

Except as provided by the Minister's Licence, no person shall hunt any game animal without the Game Licence for such animal and the permit for such area previously sought and obtained from the Minister.

Forest reserve The President, by decree, may declare any area as a forest reserve. No less than ninety days notice in writing of the proposed declaration of the said area as a forest reserve is to be given, and the notice is to be published in the Official Bulletin and exhibited at the office of the relevant District Commissioner. The District Commissioner deals with objections regarding the declaration of a specified area and any land rights prior to legal establishment.

Without a licence or other lawful authority, prohibited activities include: cutting, burning, injuring, removing or damaging any forest produce; clearing or cultivating any land; constructing any work place; residing on any land; erecting any building, shelter or livestock enclosure; the grazing of livestock; the collection of honey or beeswax; the construction of any road, path, water course or fence or the obstruction of the like; and damaging or in any way interfering with a beacon, fence or notice board.

The Minister may, by decree, exempt the whole or any part of any forest reserve from a number of provisions in the Act as he may think fit.

Grazing reserve The Minister may, after having heard the opinion of the relevant District Commissioner, declare any area of unreserved land to be a grazing reserve for the purpose of controlling grazing in such areas.

The Minister shall prescribe: the periods and duration when a grazing reserve shall be open or closed; the number and kinds of animals to be allowed into a

grazing reserve; and the fees payable per head of animal for any specified period.

The Minister may, by decree, declare that any grazing reserve shall cease to exist.

Unreserved land The Minister may, by decree, declare that any tree or class of trees be reserved on any unreserved land.

Without a licence or other lawful authority, prohibited activities include: the cutting, felling, damaging, or removing any tree; and the collection of seeds for the purpose of sale, barter or profit or for use in trade, industry or commercial undertaking.

Source: Original legislation

Title : Wildlife Law and Regulations (proposed)

Date: 1990

Brief description: Make provision for the conservation and management of wildlife and its habitats in Somalia.

Administrative authority: Somali Wildlife Service (Director)

Designations:

Protected Area

Any area declared a national park, national conservation area, or a national reserve.

National reserve Such areas are created where the Minister considers that the fauna or flora in a particular area is either in danger of extinction and its survival is unlikely if it does not receive strict protection or it is otherwise highly endangered.

The creation, addition to, reduction in size, or disestablishment is by resolution of the Peoples Assembly.

National park Such areas are created where the Minister considers: the wildlife or wildlife habitat to be under threat from serious adverse factors; there is a significant wildlife ecosystem free of human disturbance which should be preserved for educational or recreational purposes; or, there are features of great natural beauty that are desirable to preserve.

The creation, addition to, reduction in size, or disestablishment is by resolution of the Peoples Assembly.

Such areas or parts thereof may be closed to the public for the protection of animals or vegetation; for safety of

the public; for the protection of a road or for climatic or for any other reason that the Director sees fit.

Unless authorised, prohibited activities in national parks and national reserves include: hunting, molesting or disturbing of animals; the discharge of oil, chemicals or other toxic material in or adjacent to these areas; obstructing rivers or lakes in or flowing into such areas; the cutting, injuring or setting fire to any vegetation; collecting honey or beeswax; damaging or removing any object of geological, prehistoric, marine or other scientific interest; introducing any animal; occupying, clearing or cultivating any land; carrying out mining, quarrying or prospecting activities; constructing any building or structure; bringing any weapon, ammunition or explosive into such areas; or making any commercial film.

Restrictions also apply to entry into these areas, camping and travelling within national parks, and the flying of aircraft in the vicinity thereof.

Other prohibited activities in national parks include: littering; causing unnecessary noise or doing any act likely to annoy or disturb another person; displaying any notice or advertisement within such areas; or, conducting business within the park.

National conservation area Such areas are declared where the Minister is satisfied that a measure of control is required in an area for the purpose of protection of wildlife, wildlife habitats, scenic beauty, sites of scientific or other importance or value, for the purpose of ensuring the security of the wildlife or its habitats of a neighbouring national park or national reserve, or for the purposes of the control of smuggling of animals or trophies in areas bordering neighbouring countries.

Entry of non-residents without a permit may be restricted to any part of such areas for the purposes of the protection of vulnerable wildlife populations or for the restoration or protection of flora or wildlife habitat.

Transfrontier wildlife protection area The Minister may propose the establishment of a protected area in a frontier zone adjacent to a conservation area established by a neighbouring country where the conservation areas of both countries shall together form a natural ecological unit and it is desirable to conserve wildlife through its natural range.

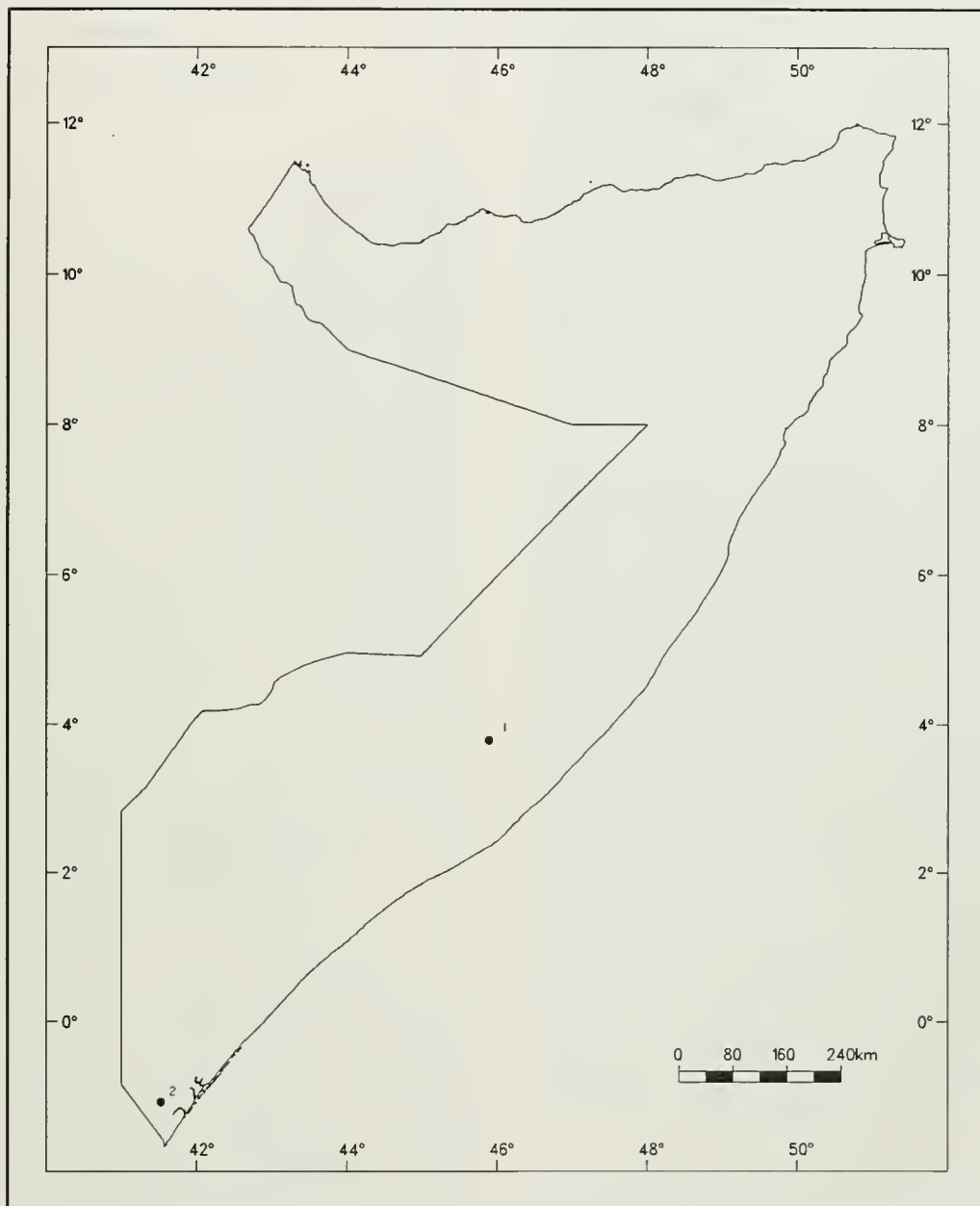
Provisional national reserve and national park Such areas may be declared where the President is satisfied that there is an urgent need to save wildlife, a wildlife habitat or an ecosystem of an area from imminent destruction or irremedial damage.

Source: FAO, 1990

SUMMARY OF PROTECTED AREAS

Map ref.	<i>National/international designations</i> Name of area	IUCN management category	Area (ha)	Year notified
1	<i>Nature Reserve</i> Alifuuto (Arbowerow)	IV	180,000	
2	<i>Game Reserve</i> Bushbush	VIII	334,000	1969

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Somalia

SOUTH AFRICA (REPUBLIC OF)

Area 1,221,040 sq. km

Population 39,600,000 (1990)

Natural increase: 2.7% per annum

Economic Indicators

GDP: US\$ 2,439 per capita (1987)

GNP: US\$ 2,290 per capita (1988)

Policy and Legislation

At a national level the constitution, dating from 1984, has sections which pertain to environmental affairs. Many aspects of conservation policy, legislation, administration and management are, however, managed on a regional basis. The four provinces of Cape, Transvaal, Natal and the Orange Free State, which make up the bulk of the country by area, have local governments which are primarily responsible for certain provincial matters, including most aspects of wildlife conservation: they have their own conservation agencies and some of their own legislation. There are also, separate from the provinces, ten homelands. Six of these, referred to in some of the literature as national states, have a degree of self government, but still form part of the Republic. These are: Kwa Zulu, Gazankulu, Lebowa, Qwaqwa, KaNgwana and Kwa Ndebele. The remaining four homelands are regarded by the South African government, although not by the international community, as independent. These are Bophuthatswana (granted full independence in 1977), Transkei (1976), Venda (1979) and Ciskei (1981). The central governmental authorities involved in conservation do not have jurisdiction in these four "independent" homelands. Rather, these homelands have their own legislative framework - much of this appears to be based around South African legislation carried over at independence, but some of these Acts have since been repealed and amended, and others have been added.

The Environment Conservation Act No. 100, 1982 was a wide-ranging Act covering the establishment of the Council for the Environment and a range of other conservation issues (Hoogervorst, 1986). Introduction of statutory environmental impact assessment legislation was first discussed in depth under this Act by the Interim Committee on Environmental Impact Assessment, which was organised by the Standing Committee for Environment and Society, a part of the Council for the Environment (Hoogervorst, 1986). The Act also proclaimed a limited area, extending 1km inland from the high water mark along the coast: development was controlled and certain activities were prohibited without a permit in this area (Hockey and Buxton, 1989). This latter provision, has however, fallen away (Brooks, pers. comm., 1991). A replacement for this Act, also called the Environment Conservation Act No. 3, was passed in 1989. The purpose of this Act is "to provide for the

effective protection and controlled utilisation of the environment and matters incidental thereto". This legislation provides for the institution of the Committee for Environmental Management under the Department of Environment Affairs (Hall-Martin, 1990). This new version of the Act incorporated a National Policy for Environmental Conservation; a tentative provision for the incorporation of statutory environmental impact assessments and some provisions to allow the public a stronger voice when making legal challenges against administrative decisions concerning the environment (Deacon, 1990; Glazewski, 1989). This Act also makes provisions for two new protected area categories: protected natural environment and special nature reserves (see Annex). It also provides for a land control category, namely the limited development area (Hall-Martin, 1990). This Act has recently been repealed in the Cape (Rebello, pers. comm., 1991).

The Council for the Environment set about forming a series of policy documents on topics including environmental education, coastal-zone management, protected areas, open-space planning, and integrated environmental management. In addition, the Council initiated the preparation of an overall "National Environmental Policy and Strategy", which provides the conceptual basis for, and integrates the different facets of environmental matters: this includes the maintenance of biotic diversity as an important feature. The policy and strategy document draws heavily on the World Conservation Strategy, national conservation strategies already produced by a number of other countries, white papers submitted to the South African Parliament, and the Report on Nature Conservation by the President's Council. Among the broad goals identified in this policy are the preservation of genetic diversity and ensuring the sustainable utilisation of species and ecosystems. Seven fundamental principles and strategic approaches form the basis of the proposed policy and include, among other things: the integration of planning for conservation and development; the development of environmental knowledge and a predictive capacity for future application; the development of procedures for integrated environmental management; and the education of and active participation by the public in environmental matters (Botha and Huntley, 1989).

The major national protected areas legislation is the National Parks Act of 1976, amended to 1987 (Act No. 60), which revises, amends and consolidates the earlier acts of 1926 and 1962. It lays down provisions for the establishment and management of national parks (see Annex). Schedules of the Act define eight national parks. Further parks may be created by presidential proclamation and may include marine and coastal areas, although existing marine reserves have all been declared under the provisions of the Sea Fisheries Act (see below). Boundaries may be extended by proclamation,

but exclusion of an area from a park requires a parliamentary resolution. The minister is authorised to acquire land for park purposes by purchase, exchange or expropriation. A 1983 amendment (Act 23) to the National Parks Act makes provision for the purchase or acquisition of core areas on private lands, or in other possession, to be declared national parks, with all the characteristics and legal protection of existing national parks. The Act also provides for the inclusion, with the written approval of the owners, of suitable adjacent land, to be known as "contractual national parks". These contractual parks constitute an integral part of the buffer areas which surround the core areas: core areas cover the natural phenomenon or feature that is particularly singled out to be preserved as a national asset, while the buffer areas cover the surrounding areas, giving better protection to the core and together forming a more viable unit. The Lake Areas Development Act No. 39, 1975 provides for the establishment of national lake areas under the control of the National Parks Board (see Annex) (Hockey and Buxton, 1989).

The most important current forestry legislation is the Forest Act No. 122, 1984, amended by the Forestry Amendment Act No. 53, 1991 (see Annex). This Act regulates the setting aside of land as nature reserves, protection forests and also as wilderness areas. In addition, the Act covers fire control measures, including the clearance of firebelts (Anon., 1972). Areas are also protected as mountain catchment areas under the Mountain Catchment Areas Act, No. 63, 1970 (see Annex).

Marine reserves were first described in Section 13 of the Sea Fisheries Act No. 58, 1973 and the accompanying Sea Fisheries Regulations which were amended some 62 times between 1974 and 1987 (see Annex) (Hockey and Buxton, 1989). A new Sea Fisheries Act No. 12, 1988 provides policy guidelines for the conservation and optimal utilisation of living marine resources, under the jurisdiction of the Chief Directorate of Sea Fisheries, the Department of Environment Affairs (Hall-Martin, 1990).

There are a number of conservation areas which have no legal status but are of conservation significance: many privately-owned sites are being registered as natural heritage sites under the Natural Heritage Programme, or as Sites of Conservation Significance. South Africa also has a very large number of private game reserves (see Systems Review).

Natal Present legislation is based on the Nature Conservation Ordinance No. 15, 1974, which deals with protected areas, hunting, and the protection of species of animals and plants (Natal Parks Board, n.d.; Brooks, pers. comm., 1991). Categories found include parks, nature reserves and game reserves.

Transvaal The most important piece of environmental legislation is the Transvaal Nature Conservation Ordinance No. 12, 1983 which enables the

Administrator of the province to declare areas as nature reserves, and also to amend or withdraw such declarations. The Ordinance also covers hunting, protected species of animals and plants, and fisheries (Anon., n.d.). The management of private protected areas as privately-owned nature reserves is also covered under this legislation (Lötter, pers. comm., 1991).

Cape Provincial nature reserves, local nature reserves and private nature reserves may be designated by the Cape Department of Nature and Environmental Conservation under the Nature Conservation Ordinance of 1974. In 1988, the administration of a number of coastal and marine reserves was handed over to the Department and they were designated as provincial nature reserves (Hall-Martin, 1990).

Orange Free State Legislation dealing with protected areas, control over hunting, selling, and transportation of game, fish, and protected plants is the Nature Conservation Ordinance No. 8, 1969, amended to 1991. This Ordinance enables the Administrator of the province to declare certain areas as nature reserves, and to amend or withdraw such declarations (Jansen, pers. comm., 1991). Other protected area categories include game farms and game reserves (Greyling and Huntley, 1984).

National states (Leboura, Ganzakulu, Qwa-qwa, Kangwane, Kwa Ndebele and Kwa Zulu) Kwa Zulu was proclaimed a self-governing territory in 1977 and the legislative assembly was given wide legislative powers which included forestry and environmental conservation. Proposals for future conservation areas in Maputaland (Kwa Zulu) are given in Bruton (1980). No information is available for the other national states.

Bophuthatswana There are a number of national parks, game reserves and nature reserves; an amended National Parks Act was passed in 1987. An Executive Council Policy Directive was prepared by the Board and has been approved by the President. This policy covers the protection of endangered species and the establishment and management of natural and semi-natural areas as part of the "Parks and Wildlife Estate", while suggesting that, where appropriate, the renewable, wild, natural resources of the country should enhance rural productivity and improve the quality of human life. It is thus very much concerned with producing a stable nature conservation system in the homeland that is based on the values and the needs of the local population (Collinson, 1987; Thomson, 1984). The policy outlines a direction for the National Parks Board that fits the philosophies of the Board and to some degree circumvents what is seen as restrictive in the existing legislation. The policy divides national parks and nature reserves into two classes, thus giving five categories in total: national park (Class 1), national park (Class 2), game reserve, nature reserve (Class 1) and nature reserve (Class 2). In the Class 2 category for both national park and nature reserve, restrictions are likely to be less stringent with greater allowances for the local human population and

for visitors, including limited habitat modification and restricted use by domestic livestock (Thomson, 1986).

Ciskei There are a number of indigenous forests proclaimed under the Ciskeian Forestry Act No. 6, 1976), many of which form part of the larger state forests. There is also a game park. The major recent legislation is the Ciskeian Nature Conservation Act No. 10, 1987. In terms of marine and coastal legislation, this Act replaces all the existing South African legislation; it establishes a coastal conservation area which extends 1 km inland from the coast: any development within this area must be sanctioned by the Ciskeian Department of Agriculture, Forestry and Rural Development (Hockey and Buxton, 1989).

Venda The Venda Nature Conservation Act No. 10, 1973 allows for the creation of national parks; there is one such national park presently under its jurisdiction (Greyling and Huntley, 1984).

Transkei Categories include nature reserves and forest reserves. Transkei retains both the South African Seashore Act, and the Sea Fisheries Act and Regulations as they were amended at independence in October 1976. However, effective policing of these only appears to occur in those nature reserves that lie on the coast (Hockley and Buxton, 1989).

International Activities At an international level, the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) was signed without reservation as to ratification on 12 March 1975, with seven sites having been declared (March 1991). South Africa is not party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), and no biosphere reserves have been declared under the Unesco Man and the Biosphere (MAB) Programme. The position of the "independent" homelands in relation to these international conventions is unclear.

The Republic of South Africa has ratified the 1933 Convention on the Preservation of Fauna and Flora in their Natural State (London Convention), which is largely concerned with the establishment of protected areas. It is, however, one of the few African states that is not a party to the African Convention on the Conservation of Nature and Natural Resources (Africa Convention), which is widely regarded as the successor to the London Convention.

There is some transboundary cooperation with the management of border parks; Kalahari Gemsbok National Park is managed in cooperation with Gemsbok National Park in Botswana, and there are no fences between these parks (Armstrong, 1991). There has been considerable cooperation with the government of the Kingdom of Lesotho, notably between the Natal Parks Board and the Range Management Division of the Lesotho Ministry of Agriculture, Cooperatives and Marketing: together they are working on the

Drakensberg/Maluti Mountain Catchment Conservation Programme, an area which forms a major part of the catchment for the Orange River, important to both countries (Bainbridge *et al.*, 1989). The Natal Parks Board has also cooperated in the production of a management plan for Lesotho's Sehlabathebe National Park. There has been a suggestion that a series of trans-border parks and buffer zones be established between South Africa, Mozambique and Zimbabwe, linking Kruger National Park with Malapati Game Reserve in Zimbabwe and possibly incorporating some areas of Mozambique (Anon., 1990).

Administration and Management

The four major provinces of Cape, Transvaal, Natal and the Orange Free State each has its own conservation agency. Conservation and protected areas administration and management in the six "semi-independent" homelands or national states is carried out by both regional and central authorities, while the central governmental authorities involved in conservation generally do not have jurisdiction in the four "independent" homelands.

The central body concerned with protected areas, specifically national parks proclaimed under the National Parks Act, is the National Parks Board. This was set up by parliament in 1926 under the National Parks Act No. 56, and was the first statutory board to be instituted in South Africa. Its present terms of existence are defined under the 1976 National Parks Act No. 57. Originally there were 10 members on the Board, which was expanded to 12 in 1962, including one member nominated from each of the provinces and one from the Wildlife Society. There is now a staff of over 6,000 and all activities within national parks are carried out by the Board's own staff and management structures (Anon, 1991). Such activities include nature management, research, information services, administration and supply services, tourism, and infrastructural development. The budget of the National Parks Board in 1990 was some R 50 million, with about two thirds of this self-generated (Anon., n.d.). The policy of the National Parks Board of Trustees is largely centred on the good management and maintenance of the present national park network, and limited expansion of this network.

The Department of Environment Affairs is another central governmental body concerned with general conservation issues, incorporating the former Department of Forestry, now called the Directorate of Forestry, the Sea Fisheries Directorate and Sea Fisheries Research Institute. The Sea Fisheries Directorate is responsible for marine and offshore conservation (Hall-Martin, 1990).

The Directorate of Forestry in the South African Department of Environmental Affairs was established in 1910 – the terms of establishment currently lie within the 1984 Forest Act and the 1970 Mountain Catchment

Areas Act (Greyling and Huntley, 1984). It currently administers some 115 areas under the Forest Act and the Mountain Catchment Areas Act – management aims for these areas range from strict protection to intensive tourist use, timber production and exploitation. The budget for the 1982/1983 financial year for management and research was nearly R 8 million (Greyling and Huntley, 1984).

The Committee for Environmental Management was instituted by the Department of Environmental Affairs under the 1989 Environment Conservation Act (No. 73). This Committee brings together a wide range of government and non-governmental organisations to advise the Department on matters which may influence the protection and utilisation of the environment and to coordinate and promote the Environment Conservation Act (Hall-Martin, 1990). The Department of Environmental Affairs also contains the Directorate of Environmental Conservation which is largely responsible for the South African Natural Heritage Programme (described below) (Cohen, n.d.).

The Council for the Environment is a separate body which was established in 1982 under the Environment Conservation Act. Its role is to advise the Minister of Environment Affairs and Tourism on the coordination of all actions directed at or liable to have an influence on any matter affecting the conservation and utilisation of the environment. The Council consists of 25 members. The Council's work is carried out by five standing committees and four working committees. The four working committees include Environmental Education, and Coastal and Marine Systems. The standing committees include Natural System, Environment and Society, and Policy and Strategy (Hoogervorst, 1986).

Members of the Department of Environment Affairs, the National Parks Board and the four provincial conservation agencies serve on the regional development advisory committees which play an important role in relation to regional development activities. In many areas non-governmental organisations may also be represented on these regional committees, and several of the committees have environmental sub-committees and have achieved a balanced assessment of conservation and development needs (Hall-Martin, 1990).

The four provincial conservation agencies, the National Parks Board and other official agencies dealing with the environment, coordinate their assessments of the need for establishing new protected areas with the Directorate of Nature Conservation, in a forum known as the South Africa Plan for Nature Conservation. The Plan makes use of a network of ten regional working groups convened by members of the provincial nature conservation agencies and comprising representatives of all the relevant bodies, including those in all ten of the homelands, which maintain a continuous review of protected area needs. Areas worthy of protection are identified and rated in terms of national priorities.

Protection methods are proposed and carried out as far as possible. The Department of Environment Affairs also maintains a data-bank on all protected areas as part of the South African Plan for Nature Conservation, with information supplied by the authorities responsible (Hall-Martin, 1990). Another major programme administered as a part of the South African Plan for Nature Conservation is the South African Natural Heritage Programme (mentioned in Systems Reviews).

The Council for Scientific and Industrial Research (CSIR) is the major central scientific body in South Africa. It runs a series of cooperative scientific programmes, which are open to participation by all scientists and scientific institutions in South Africa. Several of these programmes are concerned with environmental problems, notably the National Programme for Environmental Sciences which, with its guiding committee, coordinates research under the headings of inland water ecosystems, terrestrial ecosystems, nature conservation (including habitat conservation and the management and utilisation of wildlife) and human needs, resources and the environment. This programme aims to improve management and utilisation of ecosystems and natural resources, to contribute to international scientific activities, and to provide user agencies such as governments, provincial administration and non-governmental organisations with information required for planning purposes to keep environmental problems to a minimum (Anon., 1984). The Division of Science and Technology at the Jonkershoek Forestry Research Centre, as a part of the CSIR, is currently looking into a project, to be funded by the South Africa Nature Foundation, to develop a digital map of all available nature conservation areas in South Africa.

Natal The Natal Parks, Game and Fish Preservation Board was established by virtue of the Natal Parks, Game and Fish Preservation Ordinance No. 35, 1947 as a semi-autonomous body funded by the Natal Provincial Administration. In 1991, the Board, widely known as the Natal Parks Board, administered 75 protected areas, including parks, nature reserves, game reserves, state forests and marine reserves (Brooks, pers. comm., 1991). The annual budget for the Board in 1991/92 was R 93 million, when there was a total staff of over 3,500 (Brooks, pers. comm., 1991). Many of the reserves qualify for national park status in terms of their management, infrastructure, biotic diversity, size and legal standing. The Natal Parks Board has also introduced the idea of conservancies, in which private landowners form cooperatives to ensure the effective conservation management of their properties: by 1991 there were some 130 conservancies, covering about 1 million ha, serviced by numerous game guards (Brooks, pers. comm., 1991).

Transvaal The Nature Conservation Division, now the Chief Directorate of Nature and Environmental Conservation of the Transvaal Provincial Administration was established in 1947 by virtue of

Ordinance No. 23, 1949; in 1991 it administered 52 provincial reserves and recreation areas, covering 299,222ha (Lötter, pers. comm., 1991). The Chief Directorate of Nature and Environmental Conservation partially administers protected natural environments, and is responsible for managing wilderness areas, mountain catchment areas, natural heritage sites (60), which currently have no legal status, and sites of conservation significance (Lötter, pers. comm., 1991). The following areas are excluded from the jurisdiction of the Directorate: national parks under the control of the National Parks Board of South Africa; Bophuthatswana; Venda; Lebowa, Gazankulu, Kangwane, and Kwandebele; protected areas managed by the Directorate of Forestry; and protected areas managed by the South African Development Trust (Lötter, pers. comm., 1991). The Directorate's budget for 1990/1991 was R 30 million (excluding salaries), with a total staff of 1,276, including 216 nature conservation officers and a research staff of 42. In addition to the areas protected at the Provincial level, there are a vast number of municipal and private reserves: there are 450 private nature reserves with a combined area of about 1,277,900ha belonging to municipalities, corporate bodies and private individuals. There are also about 1,500 private game fenced areas (Lötter, pers. comm., 1991).

Cape The Department of Nature and Environmental Conservation was established under Ordinance No. 26, 1957. In 1982/1983 it administered some 99 areas, one third of which were provincial nature reserves while the remainder were local authority nature reserves. The Department's budget for 1982/1983 was R 10,474 million inclusive of salaries, with a total of 440 staff including 250 full-time labourers and 40 researchers (Greyling and Huntley, 1984).

Orange Free State The Nature Conservation Division, now the Orange Free State Nature and Environmental Conservation Directorate, was established in 1964 by decision of the Provincial Council Executive Committee. In 1991, it administered 14 provincial nature reserves with a total area of 164,479ha. An additional 14 private nature reserves, with a total area of 13,184ha and 25 conservancies with a total area of 350,000ha, also falls under the management programme of the Directorate (Jansen, pers. comm., 1991). The Directorate's budget for 1991/1992 is over R 8 million, including the salaries of a total of 656 staff comprised of 224 conservation officers, 27 researchers and various other personnel (Jansen, pers. comm., 1991).

National states (Lebowa, Ganzakulu, Qwa-qwa, Kangwane, Kwa Ndebele and Kwa Zulu) The consolidation of the land planned to fall within these states is not yet complete. Some conservation areas which may be part of these states in the future, and which are at present held by the South African Development Trust, are administered by the Nature Conservation Subdirectoriate in the Department of Cooperation and Development. Other areas are administered by the

respective nature conservation divisions of the states. The combined budget of these conservation agencies in 1982/1983 was over R 4 million, including salaries, while the combined staff complement of these agencies was approximately 360, excluding labourers, with a total of about 30 research staff (Greyling and Huntley, 1984).

Bophuthatswana The National Parks Board of Bophuthatswana fell under the legal definition provided by the old National Parks Act (the 1976 Republic of South Africa Act) and the Bophuthatswana Nature Conservation Act. It was established in its present form in 1984 from an amalgamation of the Parks Board (also known as the Pilanesberg Game Reserve Control Committee) in the Department of Lands and Rural Development and the Division of Nature Conservation in the Department of Agriculture and Forestry; all protected areas, as well as conservation issues in general, are the responsibility of the National Parks and Wildlife Management Board as it is now called (Thomson, 1984). In 1985, the organisation of the National Parks Board was decentralised to five regions: Central, Northern, Eastern, Southern and Western (Collinson, 1985). The budget for 1982/3 was R 3,234 million, while there were some 202 staff, including a conservation staff of 126 and a research staff of 7 (Greyling and Huntley, 1984).

Ciskei Most of Ciskei's conservation effort is devoted to the conservation of the indigenous forests, of which nine have been declared. These forests, which may form part of larger state forests, are administered by the Forestry Boards of the Ciskeian Department of Agriculture and Forestry which was established by virtue of the Ciskeian Forestry Act No. 6, 1976. The 1984/1985 budget for the indigenous forests was R 509,700, excluding salaries (Greyling and Huntley, 1984).

Venda The Nature Conservation Division of the Venda Department of Agriculture was established in 1979 by virtue of the Venda Nature Conservation Act of 1973; only one conservation area is administered by this Division, Nwanedi National Park. The 1982/1983 budget for the administration of this park was some R 80,000, including salaries. Nine staff are employed by this Division and there are no permanent research staff (Greyling and Huntley, 1984).

Transkei The Division of Nature Conservation of the Transkei Department of Agriculture and Forestry was established by virtue of the Transkei Nature Conservation Act No. 6, 1971; in 1982/1983 seven conservation areas and numerous forest reserves were administered by this Division. The budget for the administration of these areas that year was some R 323,000 for the conservation areas and some R 360,000 for the forest reserves, with both these figures including salaries. Some 36 staff are involved in the administration of the conservation areas, while some 120 administer the forest reserves. There are no permanent research staff, but the University of Transkei undertakes research in these areas (Greyling and Huntley, 1984).

There are a number of national non-governmental organisations – the oldest and largest of these is the Wildlife Society of South Africa, established in its present form in 1926, incorporating the Transvaal Game Protection Association, which was formed in 1902. The Society has 30,000 members and an annual turnover of R 5 million and makes a major contribution to environmental education and research. It has some influence on the government, playing an important role in the promulgation of the National Parks Act of 1926, and was granted a permanent seat on the National Parks Board (Anon., 1991; Deacon, 1990). Another major non-governmental organisation is the Southern African Nature Foundation (WWF-South Africa). Since its foundation in 1968, this organisation has raised US\$ 10 million for almost 200 conservation projects in 12 countries of Southern Africa. The Foundation has campaigned hard for the expansion of the protected areas network and has been instrumental in the purchase and establishment of a large number of sites in South Africa (Anon., 1988).

St Lucia Game Reserve in Natal was added to the IUCN List of Threatened Protected Areas of the World in December 1990 as a result of an application by a private company to dredge mine titanium in an area of dunes.

Systems Reviews South Africa is a large country, with the longest national coastline of any African state extending some 3,000km from the South Atlantic to the southern Indian Ocean. To the north, it shares a border with Namibia, Botswana and Zimbabwe, and to the north-east with Mozambique and Swaziland. It also contains wholly within its borders the fully independent Kingdom of Lesotho. Apart from a small area in Transvaal in the north-east, most of the country lies south of the Tropic of Capricorn. There is a narrow coastal plain behind most of the shoreline which widens to some 80km in the north-east, in Zululand. On the west and east coasts, the coastal plain is backed by foothills, scarps and small plateaux leading to the massive central plateau which makes up much of the centre of Southern Africa. Most of this plateau is above 1,000m and comprises flat or gently undulating land, sloping gently down to the north-west of the country. In the south and south-west, the coastal plain is backed by several ranges of ancient fold mountains which rise in some places to over 2,000m. Their northern edge slopes down to the Great Karroo, a slightly lower plateau which lies between the ranges and the main central plateau. The port and surrounding area (1,124 sq. km) of Walvis Bay in Namibia is also administered by South Africa, and is considered to be a part of Cape Province – it lies over 500km north of the main South Africa/Namibia border. South Africa also has sovereignty over Prince Edward Islands (Marion Island and Prince Edward Island), which lie about 2,300km south-east of Cape Town in the South Indian Ocean.

The biogeographic affinities of the country are Cape in the south and south-west, Karoo-Namib in the west, Kalahari-Highveld regional transition zone in the centre,

Zambeian in the north and east, Afromontane in the Drakensbergs, and Tongaland-Pondoland regional mosaic along the eastern coast (Stuart and Adams, 1990). South Africa is renowned for its huge floristic diversity and high levels of species endemism; there are some seven floristically distinct biomes, five of which are species rich, while the Cape floristic region in the south-west corner of Cape Province has a unique flora and is one of the world's floristic kingdoms. The vegetation forms a complex mosaic determined by topography, climate and evolutionary history (Cowling *et al.*, 1989; Davis *et al.*, 1986;). Acocks (1975) provides a widely used subdivision of South African floral communities into some 70 'veld types'.

In the north and east the dominant biome is arid savanna (in the northern Cape Province, large parts of Bophuthatswana, Venda, Gazankulu, Kangwane, Lebowa and in Transvaal and Natal); in the north-east (in Transvaal and Lebowa) this arid savanna grades into moist savanna, while there are also areas of moist savanna on the east coast (in Natal and Kwazulu). A large block of grassland occupies the central areas in the eastern half of the country (including the southern half of Transvaal, much of the Orange Free State, northern Transkei and eastern Cape Province). Most of the central parts of Cape Province are dominated by nama-karoo, which grades into succulent karoo to the west, and extends to the west coast (Cape Province). In the far south-east of the country (Cape Province), the coast and inland hills are dominated by fynbos. The forest biome has a very patchy distribution on the mountains and on the coastal plains of the southern and eastern parts of the country.

The fynbos biome encompasses a broad category of evergreen sclerophyllous heathlands and shrublands dominated by fine-leaved low shrubs and leafless tufted grasslike plants of the family Restionaceae. The succulent karoo is made up of open to sparse succulent shrubland dominated by stem and leaf succulents and some fine-leaved shrubs. Both these biomes are almost entirely restricted to South Africa. With their high diversity and high degree of endemism they have a high conservation importance.

Most of the natural vegetation is grazed. This inevitably produces major changes to the natural ecosystems: the natural large herbivores are gone from most areas and there are major vegetation changes including bush encroachment over vast areas and reduction in grass cover or replacement by unpalatable species. The entire karoo and large areas of the adjacent eastern Cape are still considered to be overstocked, leading to soil erosion and other factors which, in the long run, reduce the overall carrying capacity of the land. Arable cultivation outside the homelands takes up some 12.3% of the land area – this tends to be concentrated in certain areas and in the coastal lowlands of the Natal natural ecosystems which occur now only as small isolated fragments. Natural forests only cover some 1.9% of the total land area. In other areas some land is turned over to plantation

forestry, some localised problems are occurring, with major reductions in run-off to some rivers. The invasion of alien plant species is a problem in Transvaal, and in the coastal lowlands of Natal and more especially in the fynbos biome. Existing urban areas cover some 2.5% of the country, while agricultural smallholdings cover a further 3%. There are a large number of major reservoirs. These only pose a major threat to biodiversity in the fynbos biome where there are large numbers of endemic species with limited distributions. Mining has been one of the major industries contributing to the development of South Africa and in places it has radically transformed the landscape (Macdonald, 1989).

There are few wetlands of great magnitude, with the exception of the St Lucia system in the north-east of the country. The remaining wetlands, although small, are very important as much of the surroundings are predominantly dry. Most of these sites are coastal: estuarine systems, lakes, swamps, marshes, floodplains and pans. On the high mountain areas in the south-east there are extensive 'sponges' and peat bogs. On the central plateau there are many seasonal pans, endorheic lakes and some small, irregularly inundated floodplains (Hughes and Hughes, 1991). True coral reefs do not occur in South African waters. However, in the subtropical waters of the Mafutaland coast conditions do favour the development of coral reef communities which are virtually indistinguishable from true reefs. These communities are largely unspoiled – they all fall within proclaimed marine reserves and hence are well protected (UNEP/IUCN, 1988). Most coastal islands are now protected breeding localities for seals and seabirds, although the protected areas exclude most of the marine environment used by these animals (Hall-Martin, 1990).

Conservation in South Africa has a long history. Concern was first expressed about the loss of forests in the Cape in the first half of the 19th century and some protection was provided in February 1856, when conservancies were set up in the forests of the George region. A Chief Botanist of the Cape Colony was appointed in 1859 who had a major role in promoting conservation issues. The Forest and Herbage Preservation Act No. 18, 1859 was the most comprehensive form of conservation legislation passed in the British colonies that century. Around the same time, the government had begun to set up what were effectively the first 'state' game reserves in the Krysna and Tsitsikamme forests, although there was conflict here between the Forest Conservator, and the local landowners. Two of the strongest arguments facilitating the development of conservation were those of soil conservation and the safeguarding of water supplies through forestry. There then followed a period from 1866 when conservation issues were considered less important, and much of the forest was destroyed by various agricultural and commercial interests (Grove, 1987). A resolution by the State President, approved in 1889, led to the proclamation of the first official state game reserve in 1894 on the Swaziland border, known today as Pongola Nature Reserve in Transvaal; two were

established in Pretoria in 1895; and five game reserves were established in Zululand (Natal) in that same year. From 1887, forest reserves were being established in the west of the country and by the end of the 19th century, 355,559ha of forest reserve had been declared in the Cape. New protected areas were added to the network at a fairly constant rate of about one per year from 1895 to 1965. This rate has increased markedly since 1966. The increase in area covered by this network is more irregular, with massive increases in certain years caused by the declaration of certain particularly large sites (Greyling and Huntley, 1984). There are now some 574 publicly owned nature reserves covering some 7.2 million ha or 5.8% of the land area. In addition, there are quite a large number of privately-owned reserves, bringing the total of reserved land to more than 6% (Siegfried, 1989). In 1984, the total area administered by the Directorate of Forestry was 1,970,000ha, made up of 1,350,000ha of state forest in the conservation forest categories and 620,000ha of mountain catchment areas on private land (Greyling and Huntley, 1984).

The most recent moves to expand the protected areas network include efforts to involve the cooperation of local landowners. Examples of this include the contractual national parks system incorporated into the 1983 amendment to the National Parks Act (see Policy and Legislation), the establishment of biosphere reserves, the system of conservancies introduced in Natal (see Administration and Management) and Transvaal, the establishment of mountain catchment areas, and the two systems now in operation under the South African Plan for Nature Conservation: the South African Natural Heritage Programme and the Sites of Conservation Significance Programme.

The South African Natural Heritage Programme was launched in November 1984 with the specific aim of extending and improving the protected areas network by incorporating private land. It was established by the Directorate of Environmental Affairs with several other bodies being involved, including the four provincial nature conservation authorities, the National Parks Board, the Directorate of Forestry and the private sector, through the Southern African Nature Foundation. The most important participants are private landowners, individuals and organisations, who are being encouraged to register sites as part of the programme. To qualify for registration, sites must contain one or more of the following: stands of special plant communities; good examples of aquatic habitats; sensitive catchment areas; habitats of threatened species or outstanding natural features. Registered sites may be visited periodically by representatives of the Department of Environmental Affairs. Management assistance is available for sites, provided by provincial authorities. Sites may be taken off the register by the Minister if they are destroyed or degraded, whilst landowners themselves may de-register sites, but are asked to give 60 days notice (Cohen, n.d; Cowan, 1990). Less important sites may also be registered as part of the Sites of Conservation

Significance Programme, initiated by the Natal Parks Board and launched in March 1989. South Africa also has a large number of privately-owned reserves: these include the Timbavati group of unfenced private game reserves in the eastern Transvaal which are the largest in the world, and are largely financed by tourism, although sport-hunting also occurs in some of them (Anon., 1990b).

The South African Defence Force is also a major landholder, and controls 60 areas which together cover some 525,000ha. Efforts are being made to improve the conservation status of these areas, soil erosion is being combated, and some species have been reintroduced. Much of this work is being conducted in consultation with the Wildlife Society of South Africa (Cooper, 1987).

Of the seven major biomes found in South Africa, three are very poorly represented in protected areas: succulent karoo (0.79% of the biome area is protected); Nama-karoo (0.83%) and grassland (2.00%). Moist savanna is also not particularly well protected; 5% of its total area. The other three biomes are well-represented: arid savanna (12.11%); fynbos (26.26%) and forest (77.36%). There are still gaps in the protected areas network within these categories. Despite repeated calls to redress the balance, there has been no major response to increase the area of protected karoo and grassland (Siegfried, 1989). A detailed analysis of biodiversity at the national level, and proposals for conservation is given in Huntley (1989). Proposals to improve the protected area system are also given in MacKinnon and MacKinnon (1986) and IUCN (1987).

Prince Edward Islands are oceanic islands of volcanic origin. They have a tundra type of vegetation, with mires and tussock grassland rising to wind desert on the slopes. There are no permanent inhabitants on the islands. However, a permanent presence has been established for scientific and meteorological work, as a part of the South African Scientific Community for Antarctic Research. While there are no protected areas on these islands, most of the important fauna is protected under the Sea Birds and Seals Protection Act (Act 46 of 1973). Membership of the Antarctic Treaty, the Commission for the Conservation of Antarctic Marine Living Resources, and the Scientific Committee on Antarctic Research also implies acceptance of certain conservation orientated agreements and recommendations for these islands (Greyling and Huntley, 1984).

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Council for Scientific and Industrial Research, Program for the Environment, PO Box 395, PRETORIA (Tel: 12 841 2911)

South African Natural Heritage Programme (Coordinator), Department of Environment Affairs, Private Bag X447, PRETORIA 0001

National Botanical Institute (NBI) (Chief Director), Kirstenbosch, Private Bag X7, CLAREMONT 7735 (Tel: 21 762 1166; FAX: 21 762 3229).

Natal Parks, Game and Fish Preservation Board (Director), PO Box 662, PIETERMARITZBURG 3200, Natal

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Cape Department of Nature and Environmental Conservation (Director), Private Bag X9086, CAPE TOWN 8000

Orange Free State Nature and Environmental Conservation Directorate (Chief Director), PO Box 517, BLOEMFONTEIN 9300

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Antarctic Division (Director General), Department of Transport, Private Bag X193, PRETORIA 0001

Bophuthatswana: National Parks and Wildlife Management Board (Director), Private Bag X2078, 20c Warren Street, MAFEKING 8670, Bophuthatswana (Tel: 01401 32582/3/4/5/6/7; Tlx: 3110 BP)

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Transkei: Department of Agriculture and Forestry (Director), Private Bag X5002, UMTATA, Republic of Transkei

Venda: Department of Agriculture and Forestry (Secretary), Private Bag X2247, SIBASA, Republic of Venda

The Wildlife Society of Southern Africa (Director), Conservation Division, 100 Brand Road, DURBAN 4001 (Tel: 31 210909; FAX: 31 219525)

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Environment Conservation Act (No. 73)

Date: 1989

Brief description: No information

Administrative authority: Department of Environment Affairs (Director General)

Designations:

Protected natural environment No information

Special nature reserve No information

Source: Hall-Martin, 1990

Title: National Parks Act No. 57

Date: 6 April 1976, amended to 1987

Brief description: Revises the National Parks Act, 1962. Makes provision for the designation and management of national parks, and for the constitution and work of the National Parks Board of Trustees.

Administrative authority: National Parks Board (Chief Director)

Designations:

National park "The object of the constitution of a national park is the establishment, preservation and study therein of wild animal, marine and plant life and objects of geological, archaeological, historical, ethnological, oceanographic, educational and other scientific interest, and objects relating to the said life or the first-mentioned objects or to events in, or the history of, the park, in such a manner that the area which constitutes the park shall, as far as may be and for the benefit and enjoyment of visitors, be retained in its natural state" (Art. 4). "No prospecting or mining of any nature shall be undertaken in a park" (Art. 20). There is a long list of prohibitions which generally aim at preventing disturbance of the natural

environment of the parks. There are detailed provisions concerning prosecution and judicial procedure and prescribing fines, imprisonment, corporal punishment and forfeitures for different offences under the Act.

Sources: Anon, 1976; Anon, n.d., post-1987

Title: Lake Areas Development Act No. 39

Date: 1975

Brief description: Provides for the establishment of lake areas

Administrative authority: National Parks Board (Chief Director)

Designations:

National lake area No information

Source: Hall-Martin, 1990

Title: Forest Act No. 122

Date: 1984, with a major amendment, the Forest Amendment Act No. 53, 1991

Brief description: Gives the terms of establishment for the Directorate of Forestry. Provides for the designation of conservation forest and of further categories within these areas: protection forests, nature reserves, or wilderness areas.

Administrative authority: Directorate of Forestry, Department of Environmental Affairs (Director-General)

Designations:

Conservation forest (or State forest) Management objectives cover a wide range of options, both between and within conservation areas, ranging from strict protection to full scale tourist use and timber exploitation.

Protection forest No information

Source: Hall-Martin, 1990

Nature reserve No information

Wilderness area No information

Title: Sea Fisheries Act No. 58 and accompanying Sea Fisheries Regulations

Sources: Anon., 1972; Greyling and Huntley, 1984

Date: 1973

Title: Mountain Catchment Areas Act No. 63

Date: 1970

Brief description: Aims to provide for the conservation, use, management and control of land situated in the mountain catchment areas, and to provide for matters incidental thereto.

Administrative authority: Directorate of Forestry, Department of Environment Affairs (Director-General)

Designations:

Mountain catchment area No information

Brief description: Covers aspects of exploitation such as bag limits, sizes and seasons and also protection of certain areas through the declaration of marine reserves.

Administrative authority: Chief Directorate: Sea Fisheries, Department of Environment Affairs (Director-General)

Designations:

Marine reserve No information

Source: Hall-Martin, 1990

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
BOPHUTHATSWANA				
<i>National Parks</i>				
1	Borakalalo	IV	7,380	1970
2	Pilanesberg	II	50,000	1979
CAPE PROVINCE				
<i>National Parks</i>				
1	Addo Elephant	II	8,879	1931
2	Augrabies Falls	II	82,415	1966
3	Bontebok	II	2,786	1960
4	Kalahari Gemsbok	II	959,103	1931
5	Karoo	II	28,293	1979
6	Mountain Zebra	II	6,536	1937
7	Richtersveld	V	162,000	1991
8	Tsitsikamma Forest and Coastal	II	3,318	1964
9	Zuurberg	II	24,138	1985
10	Vaalbos	II	22,697	1986
<i>Nature Reserves</i>				
11	Akkerendam	IV	2,301	1962
12	Andries Vosloo Kudu	IV	6,493	1973
13	Cape of Good Hope	IV	7,675	1939
14	Commando Drift	IV	5,983	1978
15	De Hoop	IV	17,846	1956
16	De Vasselot	IV	2,560	1974
17	Doomkloof	IV	8,765	1981
18	Fernkloof	IV	1,446	1971
19	Gamka Mountain	IV	9,428	1970
20	Gamkapoort	IV	8,000	1980

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
21	Goukamma	IV	2,230	1960
22	Greyton	IV	2,220	1977
23	Hester Malan	IV	6,576	1966
24	Karoo	IV	14,000	1979
25	Ladismith-Klein Karoo	IV	2,766	1974
26	Little Karoo	IV	35,000	1987
27	Mont Rochelle	IV	1,759	1982
28	Montagu Mountain	IV	1,200	1972
29	Nietgenaamd	IV	1,577	1978
30	Oviston	IV	13,000	1968
31	Paarl Mountain	IV	1,910	1977
32	Rolfontein	IV	4,749	1970
33	Silvermine	IV	2,150	1965
34	Somerset East-Bosberg	IV	1,650	1967
35	Spitskop	IV	2,740	1967
36	Storms River	IV	13,700	1925
37	Table Mountain	IV	2,904	1963
38	Thomas Baines	IV	1,003	1963
39	Vrolijkheid	IV	1,827	1957
40	Ysternek	IV	1,212	1972
	<i>Wilderness Area</i>			
41	Groendal	IV	25,047	1896
	<i>Mountain Catchment Areas</i>			
42	Anysberg/Klein Swartberg	IV	58,785	1912
43	Groot Swartberg/Swartberg East	IV	121,002	1912
44	Groot Winterhoek	IV	81,188	1913
45	Hawequas	IV	115,910	1913
46	Hottentots Holland	IV	84,936	1907
47	Kammanassie	IV	45,508	1923
48	Kouga/Baviaanskloof	IV	172,208	1923
49	Langeberg East	IV	71,300	1896
50	Langeberg West	IV	77,096	1914
51	Matroosberg	IV	95,256	1977
52	Outeniqua	IV	158,515	1936
53	Riviersonderend	IV	69,453	1900
54	Rooiberg	IV	25,344	1934
55	Sederberg	IV	126,375	1897
56	Tsitsikamma Mountains	IV	80,000	
	<i>Indigenous Forests</i>			
57	Knysna	IV	44,230	1894
58	Tsitsikamma	IV	15,651	1890
	<i>State Forests</i>			
59	Alexandria	IV	23,566	1896
60	Bathurst	IV	5,315	1897
61	East London Coast	IV	4,369	1887
62	Outerford	IV	11,467	1896
63	Sandveld	IV	3,624	1966
64	Suurberg	IV	21,121	1896
65	Walker Bay	IV	7,118	1895
	CISKEI			
	<i>Nature Reserves</i>			
1	Cata Forest	IV	1,592	1913
2	Dontsa Forest	IV	1,209	1913

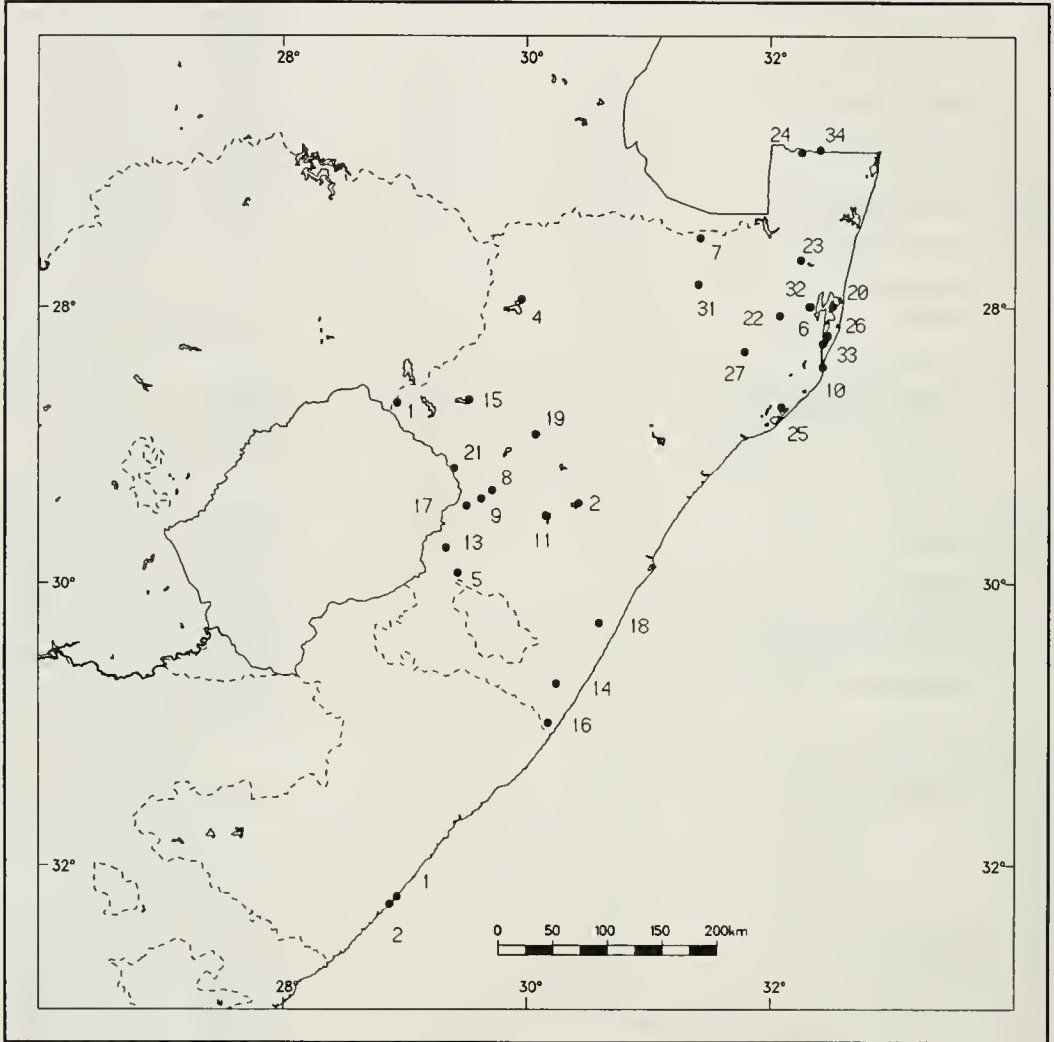
Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
3	<i>Game Park</i> Tsolwana	IV	7,557	1977
	<i>Protected Areas</i>			
4	Pirie Forest	IV	5,239	1922
5	Rabula Forest	IV	3,884	1912
6	Zingcuka Forest	IV	3,731	1913
	<i>Other areas</i>			
7	Cwengwe Forest	IV	3,276	1926
8	Izeleni Forest	IV	1,330	1917
	NATAL			
	<i>National Park</i>			
1	Royal Natal	II	8,856	1916
	<i>Nature Reserves</i>			
2	Albert Falls Public Resort	V	3,012	1975
3	Amatikulu	IV	2,928	
4	Chelmsford Public Resort	V	6,845	1975
5	Coleford	IV	1,272	1948
6	False Bay	IV	2,247	1954
7	Itala	IV	25,896	1973
8	Kamberg	IV	2,232	1951
9	Loteni	IV	3,984	1953
10	Maphelana	IV	1,102	
11	Midmar Public Resort	V	2,831	1968
12	Mt Currie	IV	1,541	1984
13	Mzimkulwana	IV	22,751	1979
14	Oribi Gorge	IV	1,809	1950
15	Spioenkop Public Resort	V	4,562	1975
16	Umtamvuna	IV	3,137	1971
17	Vergelegen	IV	1,159	1967
18	Vernon Crookes	IV	2,189	1972
19	Weenen	IV	2,929	1975
	<i>Marine Reserve</i>			
20	St Lucia	IV	23,700	1979
	<i>Game Reserves</i>			
21	Giant's Castle	IV	34,638	1903
22	Hluhluwe	IV	23,067	1897
23	Mkuzi	IV	30,503	1912
24	Ndumu	IV	10,117	1924
25	Richards Bay	IV	1,200	1935
26	St Lucia	IV	36,826	1897
27	Umfolozi	IV	47,753	1897
	<i>Wilderness Areas</i>			
28	Mdedelelo	IV	27,000	1973
29	Mkhomazi	IV	48,600	1973
30	Mzimkulu	IV	28,340	1973
31	Ntendeka	IV	5,230	1905
	<i>Parks</i>			
32	False Bay	IV	2,247	1954
33	St Lucia	IV	12,545	1939
34	Tembe Elephant	IV	29,878	1983

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>State Forests</i>			
35	Drakensberg	IV	190,000	1930
36	Dukuduku (part)	IV	15,055	1930
37	Sodwana/Cape Vidal	IV	57,954	1956
38	Weza (part)	IV	9,000	1904
	ORANGE FREE STATE			
	<i>National Park</i>			
1	Golden Gate Highlands	II	6,241	1963
	<i>Nature Reserves</i>			
2	Erfenis Dam	IV	3,808	1977
3	Hendrik Verwoerd Dam	IV	47,201	1979
4	Kalkfontein Dam	IV	5,263	1971
5	Koppies Dam	IV	4,325	1976
6	Rustfontein	IV	2,170	1974
7	Sandveld	IV	37,735	1980
8	Soetdoring	IV	6,173	1978
	<i>Game Reserve</i>			
9	Willem Pretorius	IV	12,005	1970
	<i>Other area</i>			
10	Tussen-die-Riviere Game Farm	IV	22,000	1972
	TRANSKEI			
	<i>Nature Reserves</i>			
1	Cwebe	IV	2,140	1975
2	Dwesa	II	3,900	1975
	TRANSVAAL			
	<i>National Park</i>			
1	Kruger	II	1,948,528	1926
	<i>Nature Reserves</i>			
2	AFB Hoedspruit	IV	4,236	
3	Abe Bailey	IV	1,888	1982
4	Barberspan	IV	3,086	1954
5	Bloemhof Dam	IV	22,072	1975
6	Blouberg East	IV	6,848	1977
7	Blouberg West	IV	4,450	1982
8	Blyde River Angling Waters	IV	1,800	1980
9	Blyde River	IV	22,664	1965
10	Boskop Dam	IV	3,160	1975
11	Bronkhorstspuit Dam	IV	1,285	1977
12	Doorndraai Dam	IV	7,229	1973
13	FC Erasmus Trust Forest	IV	6,600	1977
14	Fanie Botha	IV	2,638	1978
15	Hans Merenskey	IV	5,282	1954
16	Hans Strijdom	IV	3,618	1978
17	Happy Rest	IV	1,585	1975
18	Hartebeespoort Dam	IV	2,500	1969
19	Jericho Dam	IV	1,453	1977
20	Langjan	IV	4,774	1954
21	Lekgalameetse	IV	18,125	1979
22	Loskop Dam	IV	14,800	1954
23	Mangombe	IV	3,000	
24	Messina	IV	3,571	1980

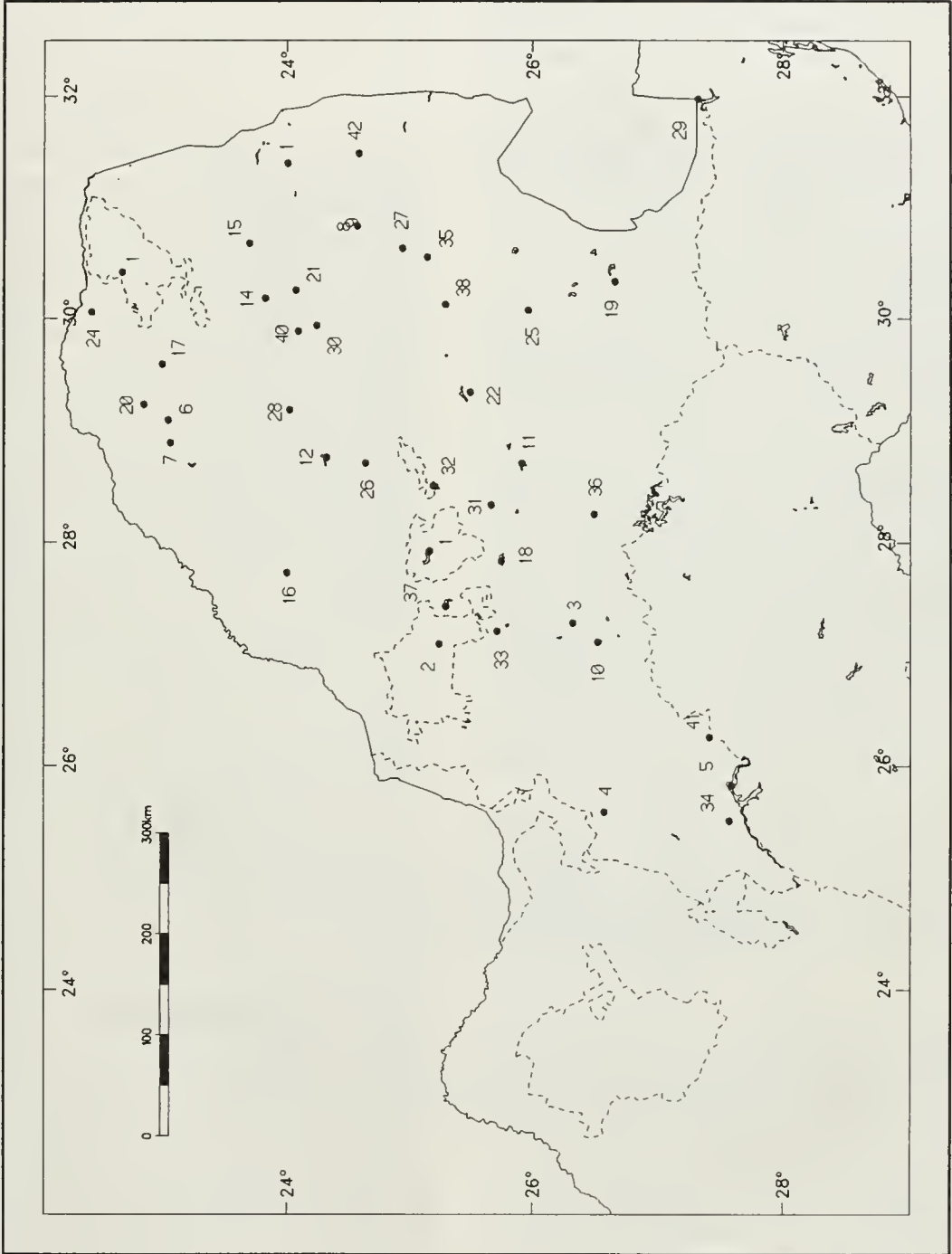
Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
25	Nooitgedacht Dam	IV	3,420	1980
26	Nylsvley	IV	3,121	1967
27	Ohrigstad Dam	IV	2,563	1954
28	Percy Fyfe	IV	2,986	1954
29	Pongola	IV	6,222	1979
30	Potlake	IV	2,928	1977
31	Roodeplaat Dam	IV	1,667	1977
32	Rust de Winter Dam	IV	1,358	1954
33	Rustenburg	IV	4,257	1967
34	S A Lombard	IV	3,663	1967
35	Sterkspruit	IV	1,600	1978
36	Suikerbosrand	IV	13,337	1974
37	Vaalkop Dam	IV	1,873	1983
38	Verloren Valei	IV	6,055	1984
39	Vhembe	IV	2,503	1975
40	Wolkberg Caves	IV	1,488	1969
41	Wolwespruit	IV	2,333	1975
<i>Game Reserve</i>				
42	Manyeleti	IV	22,772	1967
<i>Sanctuaries</i>				
43	Melkbos Houtbay Lobster	IV	83,400	
44	Saldanha Bay Rock Lobster	IV	83,400	
45	St. Helena Bay Rock Lobster	IV	14,000	
<i>State Forests</i>				
46	Ceylon	IV	3,500	1935
47	Entabeni	IV	1,924	1924
48	Morgenzon	IV	1,264	1978
49	Nelshoogte/Berlin	IV	3,500	1923
50	Serala (including Wolkberg)	IV	21,998	1977
51	Uitsoek	IV	2,270	1953
52	Woodbush/De Hoek	IV	6,626	1916
VENDA				
<i>National Park</i>				
1	Nwanedi	IV	3,200	1980
<i>Ramsar Wetlands</i>				
	Barberspan	R	3,118	1975
	Blesbokspruit	R	1,858	1986
	De Hoop Vlei	R	750	1975
	De Mond (Heuningnes Estuary)	R	1,318	1986
	Kosi Bay System	R	80,000	1991
	Lake Sibaya	R	7,750	1991
	Langebaan	R	6,000	1988
	Orange River Mouth	R	6,000	1991
	St Lucia System	R	155,500	1986
	Turtle Beaches/Coral Reefs of Tongaland	R	39,500	1986
	Verlorenvlei	R	1,700	1991
	Wilderness Lakes	R	850	1991

Category VIII forest reserves are neither listed nor mapped.

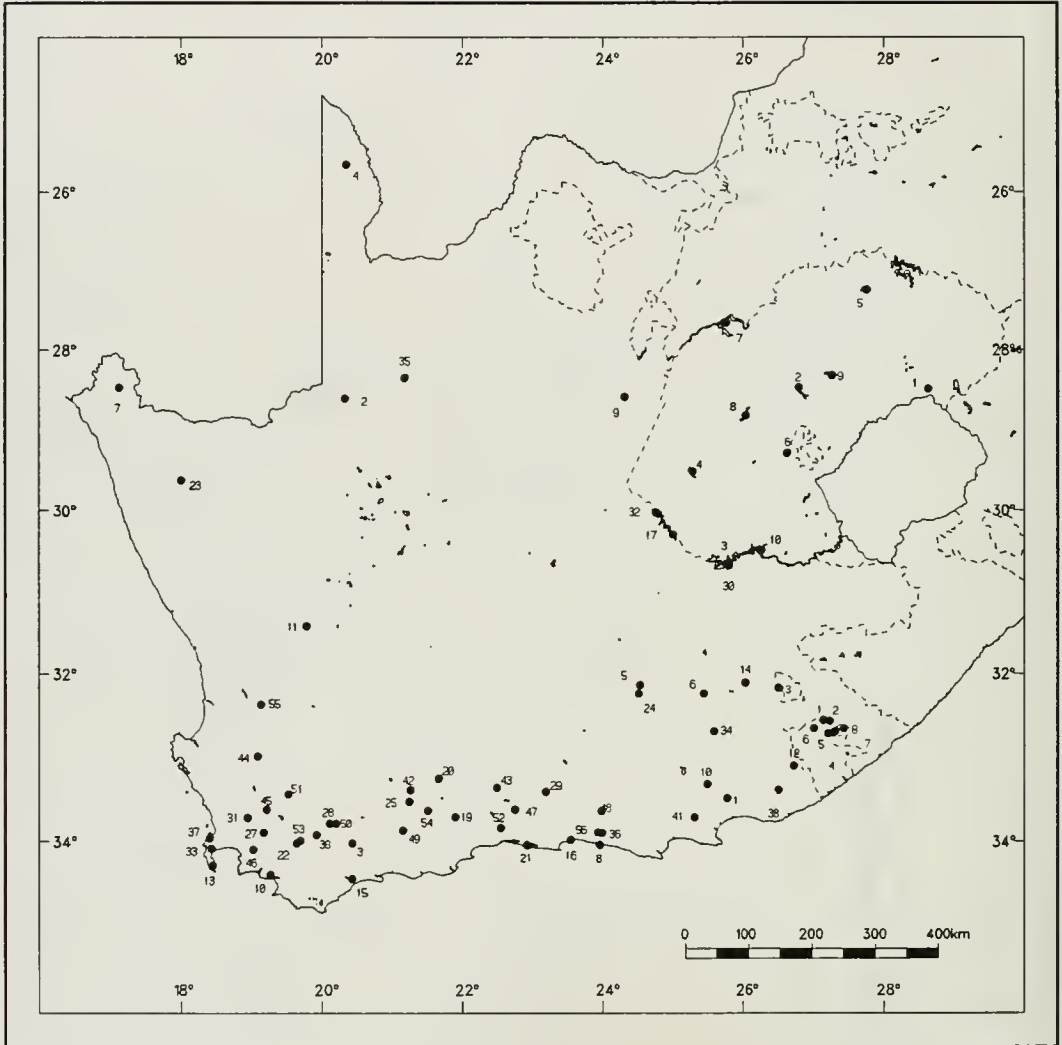
[†]Locations of most protected areas are shown on the accompanying maps.



Protected Areas of South Africa (East)



Protected Areas of South Africa (North)



Protected Areas of South Africa (South)

SUDAN

Area 2,505,810 sq. km

Population 25,203,000 (1990); comprising 500 ethnic groups.

Natural increase: 2.90% per annum

Economic Indicators

GDP: US\$ 398 per capita (1987)

GNP: US\$ 340 per capita (1988)

Policy and Legislation Under the 1973 Constitution, "natural wealth and resources", and therefore wildlife, are the property of the state. In the Northern Region, protected areas were established and managed under the Preservation of Wild Animals Ordinance of 1935, as amended to 1971, and the National Parks, Sanctuaries and Reserves Regulations 1939, as amended to 1965 (Blower, 1977; Dasmann, 1972). These legislative instruments were apparently the first such attempts to conserve wildlife, the 1935 Ordinance being based largely on the London Convention (1933) (Moore, 1974). Part III of the Ordinance enabled national parks, game sanctuaries, and game reserves to be established or abolished by Ministerial Regulation (see Annex). The Ordinance also provided for hunting licences, wildlife schedules, closed seasons, enforcement powers and general penalties (IUCN, 1986). On 13 January 1986, the "Wildlife Conservation and National Park Ordinance, Year 1406 Hegria" was passed which amended and replaced the 1935 Ordinance (Salih, pers. comm., 1991).

In 1972, Southern Sudan was given a measure of autonomy by virtue of the Southern Provinces Regional Self-Government Act. Shortly thereafter, an FAO legal consultant assisted in the formation of a new and comprehensive Wildlife and National Parks Act (Blower, 1977). With minor amendments, this Act was adopted and introduced as the Wildlife Conservation and Parks Act (1975) of the Southern Regional Government (Regional Provisional Order No. 2 of 1976). Three types of protected area were defined under this Act, namely national park, game reserve, and controlled area (see Annex). The Act also contained a statement of policy whereby wildlife was recognised as an important natural heritage to be conserved for the benefit and enjoyment of all, managed in accordance with accepted ecological principles. Further, all forms of national utilisation of wildlife resources as a source of revenue and employment for the people of the Democratic Republic was to be encouraged. Other aspects dealt with in the Act included: wildlife schedules; hunting methods; licences; wildlife trade; entry restrictions to protected areas; powers and responsibilities of the Minister, Director and wildlife officers; and offences and accompanying penalties within the Southern Region. Complimentary legislation included The Game Reserves and Controlled Areas Order, 1975 (L.R.O. No. 4 of 1976), and the Controlled Area Order, 1976 (L.R.O. No. 7, 1976),

which provided for the establishment of specific game reserves and controlled areas under the 1975 Act. These Acts have also been recently repealed with the passing of the Wildlife Conservation and National Parks Ordinance of 1986 (Salih, pers. comm., 1991).

The Marine Fisheries Regulations of 1937, amended in 1975, cover fishing activity within Sudan, and authorise the Minister to declare any territorial waters to be closed areas for the better conservation and development of fisheries. The Sudanese Marine Conservation Committee (SMCC), in consultation with IUCN, has drafted a new Marine Fisheries Act and Marine Environment Conservation Act to create a legal instrument enabling establishment of marine parks and reserves, and to regulate construction in or near the sea. This new legislation, which will replace the 1937 Regulations, has been ratified by the National Cabinet and National Assembly (Schroeder, 1981, 1982a and b; Schroeder *et al.*, 1980; UNEP/IUCN, 1988).

Natural forests are protected by the Central Forests Act (1932), the Provincial Forests Act (1932) and subsequent provincial and local standing orders made under these laws. Both acts provide for the creation of forest reserves, while the Central Forests Act makes further provision for the cutting of trees outside reserve areas, and provides for the creation of the Central Forests Administration within the Ministry of Agriculture and Natural Resources (see Annex) (FAO, 1981). In 1989, a new forest law and forest policy was drafted. The new law will allow for the creation of a number of forest reserve categories providing for protection and production functions (Ali, pers. comm., 1991).

Protected areas legislation is currently insufficiently known and enforcement is poor (Blower, 1977; UNEP/IUCN, 1988). Lack of a national land use policy has resulted in unguided exploitation of the forestry resource, and it has been recommended that a national conservation policy be developed (ESMAP, 1986; MacKinnon and MacKinnon, 1986).

International Activities At an international level, Sudan is party to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) which it ratified on 6 June 1974. To date, no sites have been inscribed on the World Heritage List. Sudan also participates in the Unesco Man and the Biosphere (MAB) Programme and two biosphere reserves have been approved. Sudan is currently not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). At a regional level, Sudan has signed the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, and has ratified the African Convention on the Conservation of Nature and Natural Resources

(African Convention), which establishes several categories of protected area.

Administration and Management Responsibility for environmental matters falls primarily under the authority of the Ministry of Agriculture and Natural Resources. Prior to 1972, the Central Government Game Preservation Department was responsible for administering national parks, game reserves, and general wildlife resources throughout the country (Dasmann, 1972). As of 1972, when wildlife resources within the Southern Region became the responsibility of that region, the Department of Wildlife, Conservation, Fisheries and Tourism was created. In 1977, this Department was elevated to the status of Regional Ministry of Wildlife Conservation, Fisheries and Tourism, responsible for tourism, and the conservation and management of wildlife resources and protected areas in the south (Blower, 1977; Stuart and Adams, 1990). Within the Northern Region, the governmental agency responsible for executing wildlife policies, enforcing legislation, and establishing and managing terrestrial and marine protected areas is the Wildlife Conservation and National Park Forces, within the Ministry of Interior (Salih, pers. comm., 1991). Formerly known as the Administration of Wildlife Conservation Forces (AWCF) by virtue of the Wildlife Conservation Forces Act, 1981, this agency is headed by a Director General and supported by a Deputy, heads of departments, professional (15), technical (10), and military support (about 550) staff (Salih, pers. comm., 1991). There are also about 575 wildlife officers and 5425 game scouts and rangers. The departments within this agency are: Administration; Technical; National Parks, Reserves and Conservation Areas; Antipoaching; and the Collective Centres Unit (Salih, pers. comm., 1991). In addition, there is a Director in each state who is a representative of the Director General.

In 1901, the first Forestry Department was created, with its activities being focused mainly on the savanna woodland area (Ali, pers. comm., 1991). Today, management of forests comes under the National Forestry Corporation (NFC), formerly the Central Forests Administration, whose activities are mostly confined to the north of the country due to the ongoing civil war (Ali, pers. comm., 1991). The Corporation is responsible for the full utilisation and continuity of forest resources, and for the creation and management of forest reserves (Johnson and Ofosu-Amaah, 1982). There are also a number of forest reserves which fall within the Rahad Agricultural Projects and thus under the authority of the respective projects.

The National Forestry Corporation is headed by a Director, who oversees the activities of three departments: Finance and Administration, Development, and Technical. Six regional directors in the north of the country are also responsible for the management of forest reserves and forestry operations in the respective regions of Khartoum, North, Khardfan, Central, Darfor, and Eastern. Each regional director is supported by deputies,

professional and technical staff. Excluding expatriates, the NFC has over 4,000 staff with about 300 professional and technical posts. Its current operating budget is over 68 million Sudanese pounds per year (US\$ 12.5 million) (Ali, pers. comm., 1991).

Forestry research is under the auspices of the Agricultural Research Corporation (ARC), with the main research centre being the Forestry Research Centre at Sabo near Khartoum (World Bank, 1986). Training in forestry and natural resources management is also provided by the University of Khartoum, University of Juba, Dubai University, and Gezira University (Ali, pers. comm., 1991). NGOs include the Sudan Conservation Society, the Sudan Wildlife Society which was founded in the northern part of the country in 1982, and the Wildlife Clubs of South Sudan (IUCN, 1990; Kingdon, 1990).

The Sudanese Marine Conservation Committee (SMCC), a sub-committee of the National Committee for Environment formed in the early 1970s, has been involved in marine conservation and in the drafting of new marine legislation (Nasr, pers. comm., 1987). Marine research is carried out by the Institute of Oceanography of the National Council for Research in Port Sudan, while the Arab League Educational, Cultural and Scientific Organisation (ALESCO) has supported much of the work on marine conservation in the country (UNEP/IUCN, 1988).

A number of constraints face the management of protected areas. The country is in need of technical assistance with planning and implementation of management, and funding, equipment and training of forestry and parks personnel is required (MacKinnon and MacKinnon, 1986). Lack of an adequate road network adds to the difficulty in managing protected areas. Currently, Boma National Park (1984) is listed as threatened on the IUCN Commission on National Parks and Protected Areas List of Threatened Protected Areas of the World. The Forestry Sector Review, in its five-year Forest Conservation and Development Programme 1987-1991, is addressing a number of the above-mentioned constraints (World Bank, 1986).

Systems Reviews Sudan is the largest country in Africa and is bounded by Libya and Egypt to the north, the Red Sea and Ethiopia to the east, Kenya, Uganda and Zaïre to the south, and by the Central African Republic and Chad to the west. The Southern Region comprises 25% of the land area of the country. Land use is such that 5% is cultivated, 22% is pasture and 19% is forest/woodland (Stuart and Adams, 1990). The majority of the population lives in rural areas and earns its livelihood from agriculture and animal husbandry (FAO, 1981).

The landscape is predominantly a basin-like plain with elevations between 300m and 900m (FAO, 1981). Peripheral highlands include a series of mountains (approximately 2,000m) which run parallel to the Red

Sea in the east, Mount Kinyeti (3,187m) to the south, and Jebel Gimbala (3,071m) in the far west (Hughes and Hughes, in press). The biogeographic affinities are Saharan in the north; Sahel Regional Transition Zone in the centre; Sudanian in the south; Somali-Masia in the south-east; Guinea-Congolian/Sudanian Regional Mosaic in the south-west; and Afromontane in the Imatong Mountains. The vegetation is such that there is desert and semi-desert in the north; Acacia wooded grassland in the Sahel zone; Sudanian woodlands in the south; lowland forest patches along the border with Zaïre; and montane forest in the Imatong Mountains. As of 1986, 0.26% was closed forest cover (MacKinnon and MacKinnon, 1986). There are extensive swamps and floodplains around the White Nile (Stuart and Adams, 1990).

Marine resources have been partially identified, but are in need of further research (Stuart and Adams, 1990). The reefs, which are found along most of Sudan's coastline, are generally considered to be in excellent condition. Localised threats include a variety of tourist impacts, land reclamation, domestic and industrial pollution (Salih, 1976; Schroeder, 1982a and b). Recently, Sanganeb Atoll Marine National Park was gazetted (1990), thereby protecting important coral reefs in that area (Aziem, pers. comm., 1991). Other marine protected areas have been proposed, as has the development of a protection plan. A national research plan has been developed, which includes marine conservation and pollution monitoring studies (Nasr, 1985)

Almost the entire drainage of the country is from south to north through the Blue and White Niles, the Sobat and the Atbara rivers (FAO, 1981). Wetlands include permanent swamps and seasonal floodplains, the most notable being the vast swamps known as the Sudd (c. 1,650,000ha), occurring along the Bahr el Jebel and its tributaries; natural lakes, particularly to the south; artificial impoundments; and mangrove swamps, salt-marshes and coastal reed swamps along the 750km Red Sea coast (Hughes and Hughes, 1991; Schroeder, 1982b). Extensive areas of the Sudd and associated floodplain are conserved in a number of game reserves, although it has been suggested that additional conservation areas be created and management improved in the ones already existing (MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990). Natural lakes within the country remain largely unprotected (Hughes and Hughes, 1991).

The majority of southern Sudan is savanna woodland, and it is here that most of the wildlife sector reserves are located. The National Parks, Sanctuaries, and Reserves Regulations, 1939 allowed for the creation of three national parks, three game sanctuaries and fifteen game reserves. Since that time, a number of other conservation areas have been legally established, bringing the total area covered to over 11.7 million ha, or about 4.7% of the country's area. However, due to the civil war of 1983, access to the south is extremely difficult and many

reserves may now exist on paper only (Stuart and Adams, 1990).

Under the mandate of the Sudan Forest Corporation, the fully constituted and gazetted forest reserves cover about 1.27 million ha, with another 1.6 million ha which has been mapped and surveyed but not yet legally gazetted (Ali, pers. comm., 1991). These forest reserves are found mainly in forest and woodlands (World Bank, 1986). Forest policy for the country specifies that 20% of the land area is to be eventually protected in the forest reserve network (Ali, pers. comm., 1991).

Certain priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). There are currently no protected areas in the desert and sahelian zones, which makes up half the country. Additional reserves are needed in savanna woodland habitats, and the montane forests (i.e. Imatong Mountains) are in need of stricter protection. Savanna grasslands, wooded savanna and closed forest have less than 10% currently conserved (Hillman, 1985). The gazetting of all proposed conservation areas, and the establishment of reserves along both sides of the Nile, the Red Sea Hills, and in the Jebel Marra and Jebel Gurgei massifs has been proposed (Stuart and Adams, 1990). Sudan has agreed to cooperate in the establishment of Gebel Elba Conservation Area. This site lies within the Sudan Government Administration Area and is protected under Egyptian law (UNEP/IUCN, 1988).

Multi-agency projects include an FAO/Netherlands government initiative which includes a forestry management component for national reserves; and a government/ICBP conservation programme which is providing assistance in preparing sites and species inventories, and is assisting with managing reserves (Stuart and Adams, 1990).

In the mid-1980s, a Forestry Sector Review was conducted. Objectives included assisting the government in developing appropriate forest development strategies, and outlining an action plan for the five-year period 1987-1991 for the fuelwood/forestry subsector (World Bank, 1986). Activities of the five-year development programme are, *inter alia*, strengthening the Central Forest Administration, initiating pilot schemes for increasing the area of savanna forest reserves to be brought under protection and management, forest inventory, and strengthening of forestry research and education (World Bank, 1986). A subsequent mission statement emphasised the need for increasing the area and protection of forest reserves in woodland areas, and promoting multiple-use management to benefit people living near forest reserves (ESMAP, 1986).

Current threats to the natural forests are: expansion of settlements and a rising human and livestock population; expansion of tea and forestry plantations; burning,

especially in montane areas; felling and clearing of forests for charcoal production; and a shift to mechanised agriculture in savanna areas (Hassaballa and Nimir, 1985; Stuart and Adams, 1990; World Bank, 1986; Ali, pers. comm., 1991). Game reserves have never received much protection and have consequently suffered from settlement, cultivation and livestock grazing (Dasmann, 1972). Like the reserves, game sanctuaries are seldom patrolled. Many protected areas, therefore, have lost much of their wildlife, and poaching of large mammals appears to be out of control (Hassaballa and Nimir, 1985; Stuart and Adams, 1990). The entire southern Sudan and much of Darfur has, at least in the south, been in a state of rebellion for 30 years, as a result of which many game animals have been shot (S. Gillett, pers. comm., 1991). Potential threats to protected areas include the construction of the Jonglei Canal, which could affect drainage patterns in wetlands of the south, and the likely increase in oil exploration (Stuart and Adams, 1990). Perhaps the largest single threat to natural ecosystems and protected areas is desertification, particularly in the north. This process has been accelerated by loss of vegetation through overuse and misuse of the land (Hassaballa and Nimir, 1985). The government, with assistance from the World Bank and other agencies, is trying to cope with this problem (World Bank, 1986).

Other Relevant Information The implementation of any major conservation initiatives is difficult at present due to the economic and political climate in the country (IUCN, 1990).

Addresses

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- Regional Ministry of Wildlife Conservation, Fisheries and Tourism, (Director), PO Box 77, JUBA
- National Forest Corporation (Director), PO Box 658, KHARTOUM
- Wildlife Clubs of South Sudan, Sabra, c/o Zoology Department, Juba University, JUBA, South Sudan

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Central Forests Act

Date: 1932

Brief description: Provides for the creation of forest reserves and regulates the cutting of trees outside such areas.

Administrative authority: National Forestry Corporation (Director)

Designations:

Forest reserve Those areas where the cutting of trees is concentrated and replanting is made immediately after felling.

Source: FAO, 1981

Title: National Parks, Sanctuaries and Game Reserves Regulations

Date: 1939, amended to 1965

Brief description: Sets out regulations for conservation areas in the country.

Administrative authority: Wildlife Conservation and National Park Forces (Director)

Designations:

National park, game sanctuary and game reserve

The use of firearms, and any agricultural, forestry or mining activity and other specified activities involving the alteration or configuration of the soil or vegetation, except with the permission of the Minister, is prohibited in these areas.

The introduction of any wild or domestic animal is also prohibited.

The Minister is empowered to make rules for the regulation of activities within each national park.

Sources: Johnson and Ofofu-Amaah, 1982; Moore, 1974

Title: The Wildlife Conservation and National Parks Act

Date: 15 December 1975

Brief description: An Act for the conservation and management of wildlife resources and the establishment of protected areas in the Southern Region of the Democratic Republic of Sudan.

Administrative authority: Regional Ministry of Wildlife Conservation, Fisheries and Tourism (Director)

Title: Preservation of Wild Animals Ordinance

Date: 1935, amended to 1971

Brief description: Provides for the management of wildlife resources and the creation of national parks, game reserves and game sanctuaries.

Administrative authority: Wildlife Conservation and National Park Forces (Director General)

Designations:

National park Hunting is prohibited, and the exploitation of resources in such areas is only allowed with the permission of the Minister.

Game sanctuary Hunting is prohibited in such areas.

Game reserve Hunting, residence, and the cultivation and grazing of domesticated animals is allowed under permit within such areas.

Source: Original legislation

Designations:

National park Areas set aside for the conservation, propagation, and management of wildlife and wild vegetation, or for the protection of sites, landscape and geological formations of particular scientific or aesthetic value, for the benefit and enjoyment of the general public.

The declaration, abolishment, or alteration of the boundaries of such areas shall be by order issued by the President of the High Executive Council.

No person shall hunt or capture any animal within such areas.

Except with written authorisation of the Director, the following activities are prohibited: cutting, clearing, burning or otherwise damaging or removing any tree, bush, plant or other vegetation; occupying, cultivating or planting any land; building any house or other structure; notwithstanding other laws, mining, quarrying, drilling for or removing any minerals, stone, gravel earth or other substances, or prospecting for such substances; obstructing, diverting or polluting any bodies of water; performing any act liable to destroy, endanger or disturb wildlife, or to destroy or alter its natural habitat; bringing any weapon, trap or poison into such areas; introducing any domestic animals; or operating any commercial undertaking or service.

Under certain conditions, concessions may be granted for the building of tourist facilities and

services in national parks, game reserves or controlled areas.

Game reserve Areas set aside for the conservation, propagation, and management of wildlife, and the protection and management of its habitat.

The establishment and abolishment of such areas, and the alteration of boundaries is declared by Ministerial Order published in the *Gazette*.

Prohibited activities include: the hunting or capturing of animals; or operating any commercial undertaking or service without written authorisation.

The Minister may make regulations prohibiting or controlling entry into, settlement, cultivation, grazing, cutting or burning of trees or other vegetation, or such other activities as he may deem necessary for the protection of wildlife and its habitat in any game reserve or controlled area.

Controlled area Areas set aside for the management and utilisation of wildlife.

The establishment and abolishment of such areas, and the alteration of boundaries is declared by Ministerial Order published in the *Gazette*.

No person shall hunt or capture any animal in such areas except under a controlled area permit.

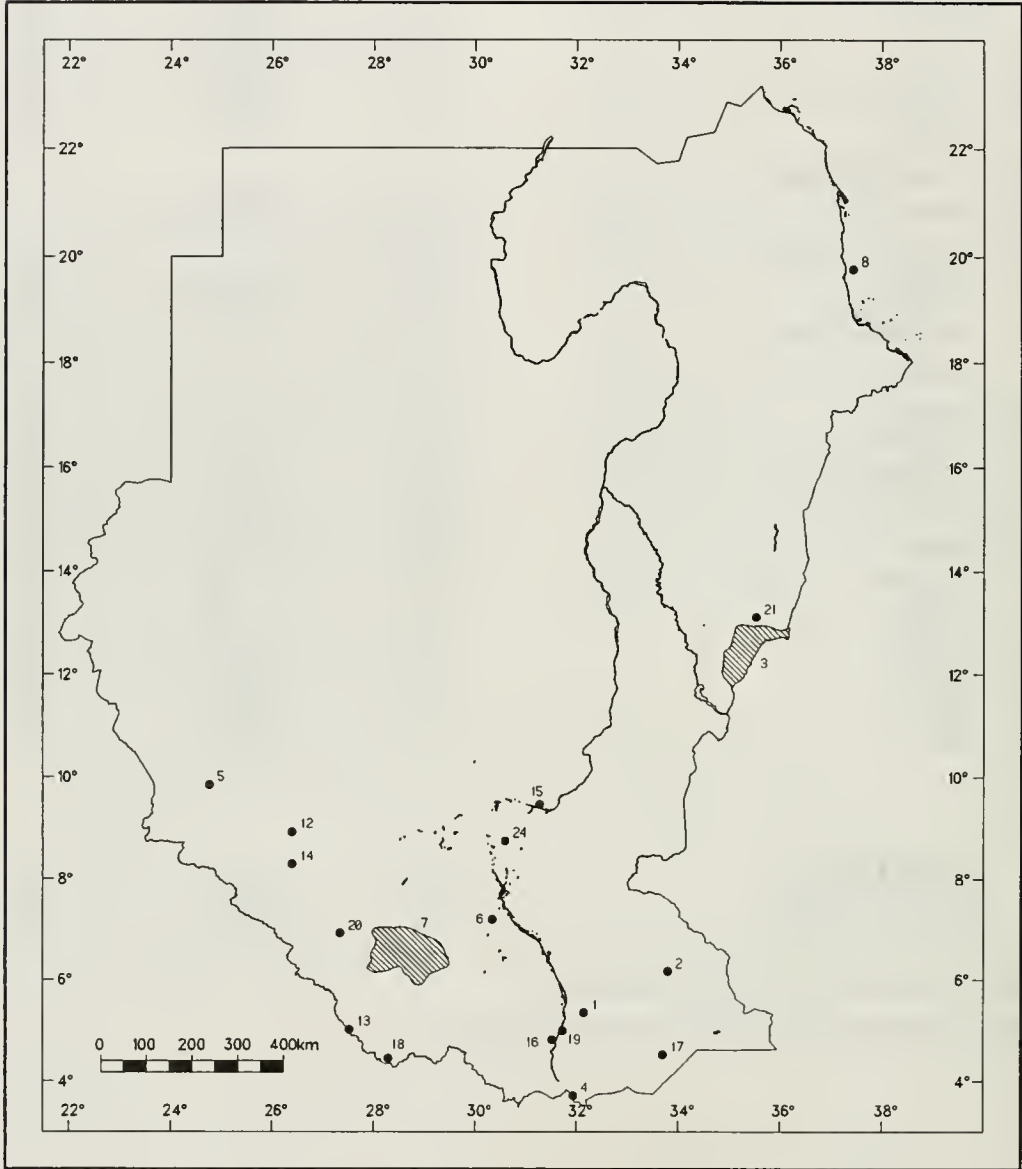
Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Bandingilo	II	1,650,000	1986
2	Boma	II	2,280,000	1986
3	Dinder	II	890,000	1935
4	Nimule	II	41,000	1954
5	Radom	II	1,250,000	1980
6	Shambe	II	62,000	1985
7	Southern	II	2,300,000	1939
	<i>Marine National Park</i>			
8	Sanganeb Atoll	II	26,000	1990
	<i>Wildlife Sanctuaries</i>			
9	Arkawit	IV	82,000	1939
10	Arkawit-Sinkat	IV	12,000	1939
11	Khartoum Sunt Forest	IV	1,500	1939
	<i>Game Reserves</i>			
12	Ashana	VI	90,000	1939
13	Bengangai	IV	17,000	1939
14	Chelkou	VI	550,000	1939
15	Fanyikango Island	VI	48,000	1935
16	Juba	VI	20,000	1939
17	Kidepo	VI	120,000	1975
18	Mbarizunga	VI	1,000	1939
19	Mongalla	VI	7,500	1939
20	Numatina	VI	210,000	1939
21	Rahad	VI	350,000	1939
22	Sabaloka	V	116,000	1946
23	Tokar	IV	630,000	1939
24	Zeraf	VI	970,000	1939
	<i>Biosphere Reserves</i>			
	Dinder National Park	IX	650,000	1979
	Radom National Park	IX	1,250,970	1979

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Sudan

KINGDOM OF SWAZILAND

Area 17,366 sq. km

Population 788,000 (1990)

Natural increase: 3.57% per annum

Economic Indicators

GDP: US\$ 787 per capita (1987)

GNP: US\$ 790 per capita (1988)

Policy and Legislation Swaziland was a British Protectorate from 1903 until 1968, under the administration of which the first modern wildlife and forestry laws were created (J. Culverwell, pers. comm., 1991). The Forest Preservation Act of 1910 covers commercial and production aspects of forests and provides for the preservation of trees and forests growing on government land and on Swazi nation land constituted under the Concessions Partition Act No. 28, 1907. Although technically still in force, this legislation, which prohibits the cutting of indigenous trees on such lands, is unlikely to be used today as much of the rural population still use and rely upon indigenous timber for building and fuel (IUCN, 1986; Masson, pers. comm., 1991). In 1952, the Flora Protection Act was passed (No. 45, 1952), which authorises the establishment of indigenous flora reserves, and specifies controls on the exploitation of certain rare or desirable species of plant; this Act is to be amended to include the category of "specially protected flora" (see Annex). The Forest Legislation of 1979 prohibits the cutting, removal, sale or purchase of indigenous timber without permission from the Minister of Agriculture and Co-operatives. Forest legislation in Swaziland currently makes no provision for forest reserves. Steps are being taken to develop a clear policy document relating to sustainable utilisation of indigenous forests, which will be followed by appropriate legislation (Attwell, pers. comm., 1991; Davis *et al.*, 1986; IUCN, 1986, 1987b).

The Game Act No.51, 1953 makes provision for the establishment of game sanctuaries (see Annex); it is also the principal act dealing with hunting of and trade in game animals, including birds considered to be game. It remains the mainstay of wildlife protection in the country apart from areas gazetted under the Swaziland National Trust Commission Act (below), and has recently been modified by the Game (Amendment) Act, to which His Majesty the King assented with effect from 14 January 1991. The major change promulgated by the Amendment is stiffer penalties for poachers (J. Culverwell, pers. comm., 1991; Masson, pers. comm., 1991).

In 1972, the National Trust Commission Act replaced the 1953 Game Act within SNTC-gazetted protected areas, and made provision for the establishment of two categories of protected area, viz. national park and nature reserve (see Annex). It also laid down the framework for the establishment of a parastatal body known as the

Swaziland National Trust Commission (SNTC), which is responsible for the conservation of the natural and cultural heritage of the country (J. Culverwell, pers. comm., 1991).

Despite provisions in the Game Act for appointment of officers, there was little enforcement of any legislation until the creation of the first protected area in 1962. The Game Act is seldom enforced outside the protected areas gazetted under its regulations. There has been sporadic success in enforcing the Wild Birds Protection Act and Flora Protection Act. The flora and fauna laws as they exist are of little use in combating the widespread environmental degradation outside of protected areas, resulting from continual heavy grazing and dense subsistence farming (J. Culverwell, pers. comm., 1991).

International Activities At an international level, Swaziland is not party to any of the major conventions dealing with protected areas. At a regional level, Swaziland is signatory to the 1968 (Algiers) African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several protected area categories.

Administration and Management The primary conservation authority in Swaziland is the parastatal Swaziland National Trust Commission (SNTC), which assumes direct responsibility for protected areas that it purchases and technical responsibility for privately-owned areas gazetted under the SNTC Act. The SNTC was originally responsible to the Minister for Agriculture and Co-operatives, but this authority was recently transferred to the Ministry of Natural Resources. *Inter alia*, it is responsible for the creation and management of nature reserves, national parks, national monuments and areas of cultural significance. Its activities are directed by a Chief Executive Officer under the control of a body of commissioners, instated by the Minister, for a period of three years. The commissioners include a Chairperson and six appointed and four elected commissioners. There are about 80 nature reserve staff, a director of parks, ecologist, administrative accountant and clerical staff (J. Culverwell, pers. comm., 1991).

Other bodies connected with protected areas are the Swazi National Council, who fund the nationally-owned Hlane Game Sanctuary; the management of this area is, however, by the same management authority as that for the privately-operated Mlilwane and Mkhaya nature reserves. These latter reserves are gazetted under the SNTC Act. The Conservation Trust of Swaziland was created on 2 December 1988 as a non-governmental organisation. The objectives of the Trust are to foster and financially aid the conservation, preservation and proper use of the environment, flora, fauna and antiquities of the

country, and to assist in the provision of training, education and research into these areas (Patrick, 1990).

The Forestry Section of the Ministry of Agriculture and Co-operatives, which has been in existence prior to the second world war, has been primarily involved in an inventory of forest resources (which are very limited), and their perspective lies in the direction of sustainable utilisation. There are no forest reserves, and only limited amounts of moist forest occur within nature reserves and game sanctuaries (J. Culverwell, pers. comm., 1991).

A body which technically has extensive functions related to the conservation, use and improvement of natural resources is the Natural Resources Board, originally falling under the Ministry of Agriculture and Co-operatives. In practice, it appears to involve itself primarily with land-use allocation and subdivision outside Swazi Nation Land (Attwell, pers. comm., 1991).

The effectiveness of management of the main SNTC-owned reserves has been compromised in the past by a lack of formally-constituted management plans, development direction and policy. A lack of well-trained individuals and an ad hoc basis to management are other constraints. There have been recent (1988) moves towards creating a measure of co-ordination between developers, subsistence farmers, Ministries and conservationists (J. Culverwell, pers. comm., 1991).

Systems Reviews Swaziland is a small land-locked Kingdom situated in south-east Africa. It is bordered on the east by Mozambique, and on all other borders by the Republic of South Africa. More than 50% of the total area is classified as Swazi Nation Land, held by the King on behalf of the Nation and consisting of communal grazing ground, and small-holdings allocated by chiefs. The biogeographic affinities are predominantly Tongaland-Pondoland regional mosaic, with Kalahari-Highveld regional mosaic in the west (Stuart and Adams, 1990). A total of 135,094ha is covered by commercial plantations of pine, eucalyptus and wattle, whilst 11,930ha of montane and highland (above 1,000m) forest occur (Government of Swaziland, 1990).

Drainage is primarily from west to east across the country. The Mbuluzi and Ingwavuma rivers rise on the highveld, while the Komati and Usutu rivers originate in South Africa. All four rivers flow through narrow gorges in crossing the Lebombo Mountains to Mozambique (Hughes and Hughes, 1991). There are no major wetlands in the country, although there are sponges found at elevations of 1400-1800 m on the summits of mountains in the western parts of the country (Hughes and Hughes, 1991). These limited wetlands are afforded a degree of protection in Malolotja and Mlilwane nature reserves of the highveld.

The country is conveniently divided into four geographical zones, which correlate closely with the known biological regional boundaries. The highveld covers 5,029 sq. km (29%) of the west of the country; it

is well-watered, and is part of the Drakensberg escarpment. Elevations range between 1,100-1,862m. Steep mountains, undulating plateau country and deep ravines create a mosaic of habitat types, from open grassland and *Protea* and *Acacia* scrub savanna, to moist Afrotropical forests. The geology of the area is complex, and parts are extremely ancient. Large areas are covered with conifer, eucalyptus and wattle plantations, the first-mentioned being amongst the largest in the world (over 70,000ha), and much of the remainder is settled by subsistence farmers. Alien plants such as black wattle and pines are spreading along river valleys throughout the area. Protected areas in the highveld are Malolotja and Mlilwane nature reserves, and the privately-owned Phophonyane and Mlumati conservation areas (J. Culverwell, pers. comm., 1991).

The middleveld is a fairly uniform area of rolling country between 300-1,050m, covering 4,597 sq. km (26%) of the country. The main rocks are ancient granites and gneisses. In historical times it was vegetated by tall grassland and mixed broad leaved and *Acacia* savanna. This fertile area was one of the first areas in Swaziland to be settled by pastoral man, and little of it now remains in an unaltered condition. Several cattle-ranches, although much affected by bush encroachment, are the only areas where indigenous flora and fauna survive in any significant numbers. No part is formally protected, apart from an area in Mlilwane Nature Reserve, which is mostly degraded and atypical. A recent alien invader is the aggressive shrub *Sesbania punicea*, which is spreading along rivers (J. Culverwell, pers. comm., 1991).

The lowveld is a semi-arid, flat to undulating plain on basalt, granite and sandstone between 150-300m, covering 6,416 sq. km (37%) of the country, extending up larger riverine valleys into the Middleveld. Most of the area was formerly a remarkably uniform thorn savanna of *Acacia nigrescens*, with *Euclea*-dominated thickets along saline drainages. The presence of tsetse fly and malaria afforded the indigenous flora and fauna a measure of protection from pastoral settlers and commercial ranching operations until the thirties, when DDT was used to eradicate the tsetse; malaria remains rife. Much of the region has been cleared and planted with sugar cane (over 20,000ha), cotton and citrus, and little of the remainder has avoided the bush-encroachment that often accompanies arid area high-yield cattle ranching. Protected areas are Mlawula/Ndzindza and Mkhaya nature reserves, and the nationally-owned Hlane Game Sanctuary (J. Culverwell, pers. comm., 1991).

The rhyolite Lubombo mountains run from north to south along the international boundary with Mozambique, and cover 1,321 sq. km (8%) of the country; elevations range between 70-1,000m. The undulating western plateau region is vegetated either by grassland, termitaria-based thickets or mixed savanna, whilst the many ravines and valleys support a variety of moist and dry forests and thickets, with a wealth of flora

and fauna. The southern half of the Lubombos have been settled by Swazi pastoralists for at least 200 years, and is subsequently much altered. The northern half, despite a number of cotton and maize farming projects, is still relatively pristine. The most significant moist forest is Jilobi, which enjoys a measure of traditional protection. Mlawula/Ndzindza Nature Reserve is the only formally protected area (J. Culverwell, pers. comm., 1991).

The protected areas network began with the establishment of a very few game reserves between 1912-14, but these were subsequently degazetted to make farming land available to returning World War I veterans. The 'Grimwood Report' of 1972 (funded by FAO), was one of the first informed attempts to recommend areas for formal protection, and recommendations were made for the creation and management of several of these. A further document was the Protection-worthy Areas of Swaziland survey of 1979, which was compiled under the aegis of the SNTC and listed over 30 areas considered worthy of protection (J. Culverwell, pers. comm., 1991). Today, the legally established protected areas network covers about 60,000ha or 3.5% of the total area of the country. In addition, there are a number of private conservation areas, which are currently not gazetted, including those proposed at Dvokolwako Diamond Mine, Lomati Valley, Mhlosinga, Mbuluzi, Simunye, Mutimuti and Phophonyane (J. Culverwell pers. comm., 1991; Masson, pers. comm., 1991).

MacKinnon and MacKinnon (1986), IUCN (1987a) and Stuart and Adams (1990) outline several conservation priorities for Swaziland. Of significance is the protection of Mahamba gorge (bald ibis breeding colony), Mnyame gorge (spectacular scenery and flora), areas adjacent to the Mlawula/Ndzindza Nature Reserve complex (reserve integrity and oribi habitat) and the Makhonjwa hills (forests) (MacKinnon and MacKinnon, 1986; IUCN, 1987a; Stuart and Adams, 1990). The north bank of the Mbuluzi gorge adjacent to Mlawula/ Ndzindza Nature Reserve has been particularly recommended for protection by a recent Forestry Section survey (J. Culverwell, pers. comm., 1991).

Threats to the integrity of protected areas include overgrazing (primarily by blue wildebeest and impala) in the cases of Hlane Game Sanctuary and Mlawula/Ndzindza Nature Reserve, and a current lack of clear-cut policies with which to counter-act this. Poaching is a constant problem, specifically with the reintroduction of white rhinoceros populations in Hlane Game Sanctuary and Mlawula/Ndzindza Nature Reserve. Rivers running through nature reserves have been affected by water extraction for irrigation, pollution from an asbestos mine in South Africa, and enrichment

by runoff from fertilized sugarcane fields. Over 30 species of alien plants have been recorded from Mlawula/Ndzindza Nature Reserve, the most abundant by far being the annual American forb *Parthenium hysterophorus* (J. Culverwell, pers. comm., 1991).

Addresses

Forestry Section, Ministry of Agriculture and Co-operatives, PO Box 162, MBABANE
 Mlilwane Wildlife Sanctuary, PO Box 33, MBABANE
 (Privately managed. Managing authority is also responsible for Hlane Game Reserve and Mkhaya Wildlife Sanctuary).
 Swaziland National Trust Commission (Chairman), PO Box 100, LOBAMBA (Tel: 61151/78/79)
 Conservation Trust of Swaziland (Chairman), PO Box 266, MBABANE (Tel: 42451; FAX: 46705; Tlx: 2213)

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ANNEX
Definitions of protected area designations, as legislated,
together with authorities responsible for their legislation

Title: Flora Protection Act

Date: 1952

Brief Description: Authorises the establishment of indigenous flora reserves, and specifies controls on the exploitation of certain protected species of plant.

Administrative Authority: Minister of Agriculture and Co-operatives

Designations: *Flora reserve*

Title: The Game Act

Date: 1953

Brief Description: Provides for the establishment of game sanctuaries, and regulates the hunting of and trade in game animals, including game birds.

Administrative Authority: Minister of Natural Resources

Designations: *Game sanctuary*

Title: The National Trust Commission Act

Date: 1972

Brief Description: Provides for the establishment of various categories of protected area, including national park and nature reserve; describes the framework for the establishment of the parastatal body known as the Swaziland National Trust Commission.

Administrative Authority: Chairman, Swaziland National Trust Commission, responsible to the Minister of Natural Resources

Designations:

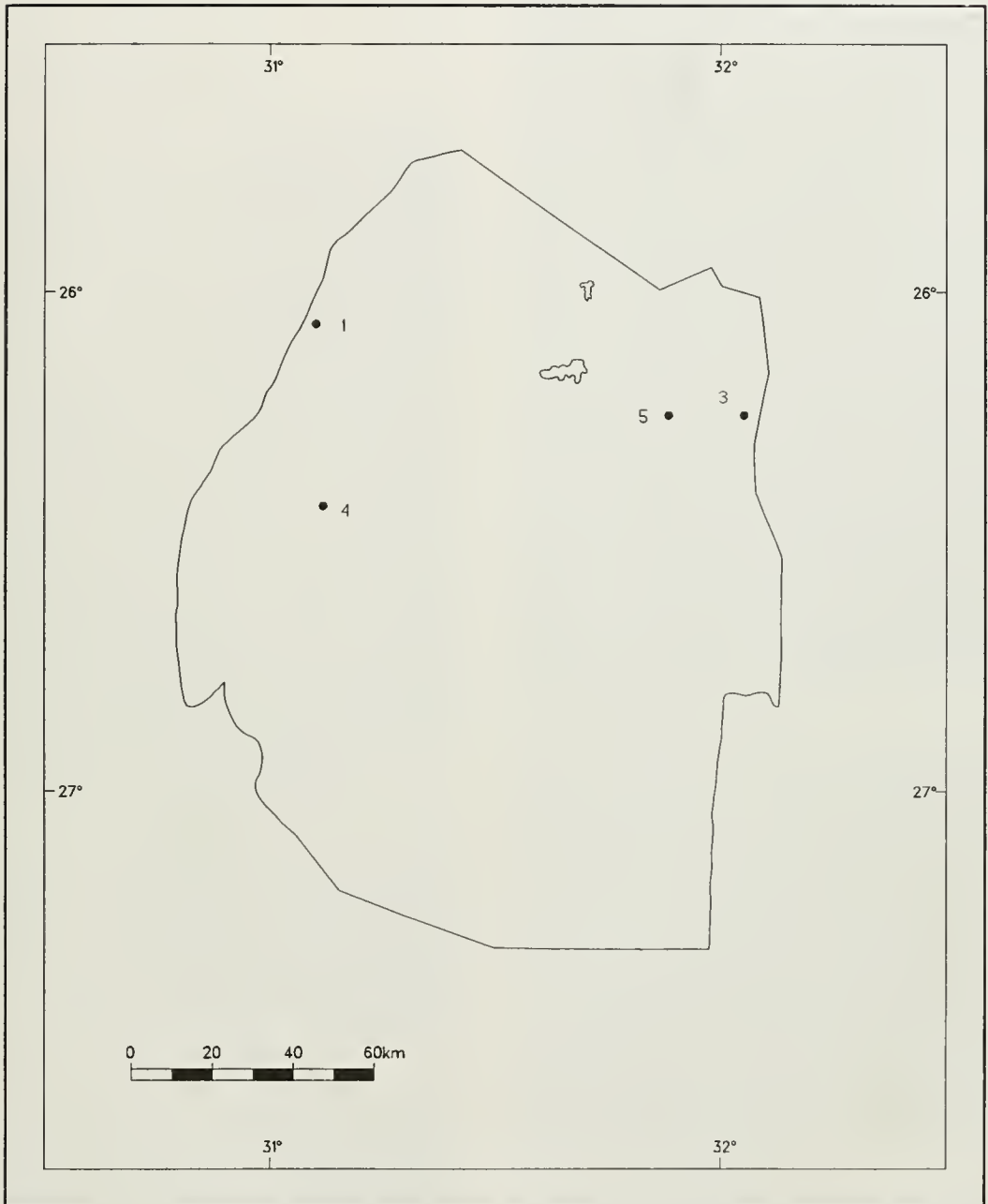
Nature reserve May include privately-owned land.

National park May not include privately-owned land.

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>Nature Reserves</i>			
1	Malolotja	IV	18,175	1972
2	Mkhaya	IV	6,200	1981
3	Mlawula/Ndzindza	IV	17,000	1977
4	Mlilwane	IV	4,545	1972
	<i>Game Sanctuary</i>			
5	Hlane	VIII	14,164	1967

Category VIII forest reserves are neither listed nor mapped.



Protected Areas of Swaziland

TANZANIA

Area 945,090 sq. km

Population 26,000,000 (1990)

Natural increase: 3.7% per annum

Economic Indicators

GDP: US\$ 145 per capita (1987)

GNP: US\$ 160 per capita (1988)

Policy and Legislation Since independence, there have been a number of declarations as to the value of wildlife and wild places, commencing with the Arusha Manifesto of 1961. More recently, President Ali Hassan Mwinyi (1990) stated the government's commitment to wildlife conservation, emphasising the rich heritage with which the country is endowed and the government's resolve to implement a policy of "conservation for the people". Following this, the Director of Wildlife (1991) stated that the overall conservation goal of Tanzania is to integrate wildlife conservation with rural development, and to maintain a viable network of protected areas which will benefit rural people, meet the demands of future generations of Tanzanians, and which will conserve the country's native flora and fauna. Specific objectives of this strategy are: to create a representative sample of protected areas which will include all important biomes of the country; to improve protected areas management by creating a single management authority; to set aside wildlife management areas (WMAs) where wildlife utilisation schemes directly benefit village communities and the private sector; and to develop a wildlife industry based on tourism, safari hunting, game ranching/farming and village wildlife schemes which will provide employment, revenue, income and food to rural people (WD, 1991).

The first protected areas legislation for the country (then Tanganyika) was Game Ordinance No. 20, 1940. Part II dealt with the provisions for the establishment of national parks and game reserves. In the schedules of the Ordinance, Serengeti National Park and eight game reserves are described. This Ordinance also covered issues of hunting and trophies and the delegation of power to game wardens. Sections 3 to 11 of the Ordinance were repealed with the approval of the National Park Ordinance in 1951.

National parks are now covered under the National Parks Ordinance (Cap 412), 1959, while regulations are covered under the National Parks Ordinance Regulations, 1970 and the National Parks (Amendment) Regulations, 1977 (see Annex). National parks are declared by Act of Parliament after approval by ministry and district/regional authorities; changes are made under the same procedure. Ngorongoro Conservation Area has its own legislation, the Ngorongoro Conservation Area Act, 1959, amended in 1975.

One of the most important pieces of extant legislation is the Wildlife Conservation Act, 1974 which repealed and replaced the Fauna Conservation Ordinance, 1951. It provides for the establishment of three categories of protected area: game reserve; game controlled area and partial game reserve (see Annex). Partial game reserves are declared by the Director, by order in the *Gazette* and consist of areas where only certain animal or classes of animals ("protected animals") are protected. Game reserves are areas where no permanent settlement is permitted, hunting is only allowed with written permission, and activities such as licensed hunting, fishing and logging are strictly controlled; sites and specific conditions applicable to that site are declared by order in the *Gazette*. Game reserves may be declared or have their boundaries altered by the competent ministry with district/regional approval (WD, 1991). Although unauthorised hunting is prohibited in game controlled areas, other activities such as settlement, cultivation, grazing and the felling of trees are permitted (WD, 1991). These areas are therefore of limited conservation value. The Wildlife Conservation Act also contains major provisions covering the hunting, capturing and photographing of animals, the registration of trophies and the dealing in these, and also provisions relating to offences. The Wildlife Conservation (Amendment) Act, 1978 contains some major amendments to the 1974 Act, notably: introducing measures designed to intensify the struggle against poaching and poachers; the proposed establishment of a Wildlife Protection Fund and a Board of Trustees to administer this Fund.

Forestry legislation was originally covered under the 1921 Forests Ordinance, but is now covered under a new Forest Ordinance (Cap. 389), approved in 1982. The principles on the creation of state forest reserves, provisional state forest reserves and local authority forest reserves are contained in Part II of this Ordinance (see Annex). The Minister may declare any area of state controlled forest reserve or provisional state forest reserve to be a state forest reserve by order published in the *Gazette*. This Ordinance also provides for a nationwide assessment of natural forest resources, with a priority for water catchment areas, with the aim of preparing management plans so that the forests are managed for the public interest; this assessment is currently in progress. About 45% of forest reserves are closed to timber production.

Marine reserves are covered by the Fisheries Act No. 6, 1970, details of which are given in the Fisheries (Marine Reserves) Regulations, 1975. Restrictions are placed on all activities in these areas (see Annex). The regulations also give details of seven marine reserves.

International Activities At an international level, Tanzania ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage

(World Heritage Convention) on 2 August 1977; four sites have been inscribed. It is not signatory to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). Two biosphere reserves have been accepted under the Unesco Man and the Biosphere (MAB) Programme. At the regional level, Tanzania is signatory to the African Convention on the Conservation of Nature and Natural Resources (Algiers Convention), which establishes several categories of protected area (see Annex).

There is some transboundary cooperation, notably with Kenya: a migration corridor, although not legally confirmed, has been established between Kilimanjaro National Park and Amboseli National Park in Kenya (Tye, pers. comm., 1991; Western, pers. comm., 1991); an action plan to conserve the Mara-Serengeti ecosystem, which includes Serengeti National Park and Masai Mara National Reserve, is currently being developed with support from the European Community (SWARA, 1989).

Administration and Management All natural resources are administered by the Ministry of Tourism, Natural Resources and the Environment, which has six separate departments: Fisheries; Forests/Beekeeping; Tourism; Planning; Environment; and Manpower and Administration. Also falling under the jurisdiction of this Ministry is the Wildlife Division and five parastatals, accountable to the Permanent Secretary through the Wildlife Division: Tanzania National Parks (TANAPA); the Wildlife Division (Government Department); Ngorongoro Conservation Area Authority (NCAA); Tanzania Wildlife Company (TAWICO); Serengeti Research Institute (SRI); and the College of African Wildlife Management (CAWM) (WD, 1991).

A Game Department was first established in 1921 and managed all game areas until independence (WD, 1991). Today, the Division of Wildlife in the Ministry of Tourism, Natural Resources and the Environment provides for the protection, conservation, development, regulation and control of flora and fauna, and is specifically responsible for the management of 17 game reserves and 49 game controlled areas. The majority of game reserves are controlled and financed on a regional basis (regional projects), while seven are known as national projects, and come directly under the management of the national Wildlife Division. These include Maswa, Mkomazi, Rungwa, Selous and Ugalla game reserves (WD, 1991). These areas are considered to be of special importance to the nation, and receive a higher input of manpower and equipment than the other game reserves. Usually only tourist hunting is allowed and no exploitation such as cattle grazing and cultivation is permitted.

The Wildlife Division contains an Anti-Poaching Unit consisting of five groups of 40-50 armed officers, operating at the request of Tanzania National Parks, the Ngorongoro Conservation Area Authority or within the areas administered by the Wildlife Division itself

(Mwalyosi, 1986). The Division also has five other sections, namely: Project Planning and Analysis; Development and Management of Wildlife Areas; Research, Training and Extension; and Manpower and Administration (WD, 1991). As of 1991, the Wildlife Division had 2,576 staff, most of whom (2,445) were field staff (WD, 1991). Total annual earnings for 1990/91 were TShs 591,676,500 or approximately US\$ 2,572,506 (WD, 1991).

Tanzania National Parks, the authority responsible for national parks, was created in the 1950s as a semi-autonomous, parastatal body answerable to the Minister of Tourism, Natural Resources and the Environment. Tanzania National Parks is headed by a Director General who reports to a Board of Trustees. The Director General oversees three departments, each of which has a Director: Parks Management and Conservation; Personnel and Administration; and Finance. Within the Parks Management and Conservation Department are five sections, namely: National Parks; Law Enforcement; Tourism; Works; and Research and Ecological Monitoring (WD, 1991). As of 1991, TANAPA had 697 staff, including chief game wardens at a number of national parks. In 1990/91 TANAPA earned over US\$ 3.5 million from gate revenues, camping fees, photographic licences, aircraft landing fees, lodge royalties, sale of recovered trophies and donations (WD, 1991).

One conservation area (Ngorongoro) is a multiple use management area, administered and managed by a separate, parastatal body known as the Ngorongoro Conservation Area Authority, established under an amendment to the Ngorongoro Conservation Ordinance in 1975 (Mwalyosi, 1986). This area was created to promote the conservation of wildlife and other natural resources and the interests of the 25,000 resident Masai pastoralists (WD, 1991). The activities of the Authority are overseen by a Board of Directors, and Departments within this organisation include Law Enforcement, Range Management, and the Ngorongoro Protection Fund (WD, 1991). As of 1991, NCAA had 304 employees, and in 1990/91 received over US\$ 1.84 million in revenue (WD, 1991).

The Division of Forestry and Beekeeping has overall responsibility for forest reserves. It is also involved in a number of other conservation-oriented projects including: the HADO project, a major soil reclamation project in the Dodoma region; community afforestation projects; the establishment of forest plantations to supply wood products and thereby reduce pressure on natural forests; and the management of the major water catchments in the country to protect water sources and preserve species diversity. The beekeeping section undertakes work involving bee resource surveys, the establishment of bee reserves, the protection and raising of bee forage plants and the encouragement of villages and public institutions to set aside and protect areas for beekeeping (Mwalyosi, 1986).

Tourism is largely the responsibility of the Tourism Division in the Ministry of Tourism, Natural Resources and the Environment. As Tanzania's tourism is wildlife-based, its development planning largely concerns the conservation of wildlife. Mass tourism is not encouraged, tourism and conservation are not seen to be conflicting – tourism is necessary to achieve development and conservation, while conservation is necessary for sound tourism management. The Division of Planning in the same Ministry is responsible for ensuring a coordinated approach to planning and development within the Ministry. It reviews the long-term, five-year and annual plans of all divisions to ensure that they are economically viable, technically sound and that they ensure all the benefits to be derived from an integrated approach essential to the overall issue of environmental protection (Mwalyosi, 1986).

The government has recently established a National Environmental Management Council responsible for: advising the government on all matters relating to the environment; bringing about coordination in environmental policy between the various agencies; and in taking the lead in the development of a national conservation strategy (Mwalyosi, 1986; Stuart and Adams, 1990).

The Tanzanian Wildlife Protection Fund (TWPF) was established in 1978 in an amendment (Section 69A and B) to the Wildlife Conservation Act. The establishment of the fund was prompted by increasing human pressures on natural resources; it channels funds and other facilities to national organisations involved in wildlife management.

There are a number of non-governmental organisations in Tanzania, many of which are supported by the Protection Fund. TWPF also produces a magazine, *Kakakuona*, which provides information on wildlife activities and issues in the country (WD, 1991).

The East Africa Wildlife Society was formed in 1961 from the amalgamation of the Wildlife Societies of Tanzania and Kenya. Over the past 30 years it has donated over US\$ 1.5 million to conservation projects, largely in protected areas, in various East African countries including Tanzania. This Society, which is based in Nairobi, has a large membership including over 150 corporate members. In 1982 the Malihai (Wildlife) Clubs of Tanzania were set up under IUCN/WWF Project 1779. The organisation's aims are largely educational and it hopes to increase awareness and understanding of the economic, cultural, scientific and aesthetic values of the country's natural resources and to promote a spirit of conservation, particularly among the young. There are some 50 clubs in three regions of the country (Mwalyosi, 1986). The Wildlife Conservation Society of Tanzania (WCST), which was established in 1988, aims to further public awareness of conservation issues and to promote conservation activities (WD, 1991). The Society financially assists various projects, including the management of reserves and the

conducting of research, and also produces a conservation magazine, *Miombo* (WD, 1991).

The College of African Wildlife Management at Mweka, established in 1963, has trained technical staff from many Anglophone African countries, and is widely recognised as the pioneer training institution of its type in the world. The training programme is directed towards middle-level managers, with the majority of graduates achieving posts of assistant and senior field officers (Moshia and Thorsell, 1984). Some research in protected areas is carried out by Serengeti Research Institute which was established in 1980 and has five research stations to undertake research in all conservation areas in the country (Mwalyosi, 1986). Other environmental research is coordinated by the Tanzania National Scientific Research Council (Stuart and Adams, 1990). The Tanzania Wildlife Conservation Monitoring project (TWCM), was initiated in 1989 as a joint project between the Wildlife Division, Tanzania National Parks, Serengeti Research Institute and Frankfurt Zoological Society. TWCM carries out aerial survey work in the conservation areas of the country, and is establishing computer databases at the Wildlife Division and at Tanzania National Parks headquarters (TWCM, 1990).

There are a number of constraints and problems facing conservation, many of which can be directly related to a shortage of funding, or lack of staff. Tanzania National Parks is faced with increasing difficulties associated with a number of problems: there is a serious lack of essential facilities and equipment as well as a shortage of qualified skilled manpower to run most of the parks. In 1986 there was a total of 26 park wardens, most of whom were not properly qualified. Serengeti Research Institute is heavily understaffed and some of the stations have no researchers. Problems facing Ngorongoro Conservation Area include: problems in implementing a multiple land use policy around NCAA since some sectors of the area do not fall under the jurisdiction of this organisation; a shortage of skilled manpower, particularly to deal with human issues in the area; and a shortage of funds (Mwalyosi, 1986). There is a need to improve coordination between the Wildlife Division and the relevant parastatals in the areas of conservation planning, training, infrastructure development, anti-poaching and law enforcement, tourism development, monitoring, wildlife utilisation, village wildlife schemes and research (WD, 1991).

Mkomazi and Uimba game reserves and Selous Game Reserve are listed as threatened by the IUCN Commission on National Parks and Protected Areas: all are suffering from intense poaching of certain species, while the first two sites are also suffering from takeover by pastoralists. Ngorongoro Conservation Area was registered as a threatened World Heritage site in 1984 due to inadequate management resources. It was taken off this list in 1988.

Systems Reviews Tanzania is the largest country in East Africa and is bordered by Kenya and Uganda to the

north, Zaire, Rwanda and Burundi to the west, and Zambia, Malawi, and Mozambique to the south. Most of the country is located on the Central African Plateau, 1,000-1,500m above sea level, which rises by slopes and scarps from a narrow coastal strip (some 15-30km wide). Inland, south of the Rufiji Valley, there is a lower plateau, mostly between 500 and 700m above sea level - slopes up to this plateau from the coastal plain are less abrupt. Kilimanjaro, in the north-east of the country, is the highest peak in Africa, an isolated volcanic massif rising to 5,895m. There are a number of other mountain ranges, notably: parallel to the border with Rwanda; along the border with Zambia; along the shores of Lake Tanganyika and at the head of Lake Malawi; and the Pare and Usambara Mountains, which form part of the "Eastern Arc" in the north-east close to the border with Kenya. In the north, about half of Lake Victoria lies within the Tanzanian border; in the west there is a long border running down the centre of Lake Tanganyika and in the south west, the border runs along the shore of Lake Nyasa (Lake Malawi). The country also embraces the Indian Ocean islands of Pemba, Zanzibar and Mafia, all around 30-50km offshore.

The biogeographic affinities are predominantly Zambezan, with a broad band of Zanzibar-Inhambane regional mosaic along the coast, Somali-Masai in the north and north-east, extending in a band into the centre of the country, Afromontane in the mountains, the Lake Victoria regional mosaic in the northwest, and a small element of Guinea-Congolian in the extreme north-west along the Ugandan border (Stuart and Adams, 1990). There is a wide range of vegetation types in the country. Most of the central and southern interior plateau areas support deciduous miombo woodland, in more arid areas, notably in the northern interior regions, this gives way to *Acacia/Commiphora* bushland. Grassland occurs on the volcanic soils of the north and on the high altitude plateaux where there is also some notable ericaceous vegetation (Davis *et al.*, 1986). The Indian Ocean islands of Pemba, Zanzibar and Mafia are also home to a large number of rare and endemic species of flora and fauna, and include some species with strong Mascarene affinities which have become extinct on mainland Africa.

Mwalyosi (1986) states that there are some 44 million ha of forestry resources, which is 40% of the land area. Over 98% of this is natural miombo woodland, with the remainder being closed tropical forest. Only a very small area is taken up by commercial plantations and community woodlots. Less than 10% of the land area is under cultivation, and 40% of the country is rough grazing. Closed forest was estimated to cover 8,500 sq. km in 1982, which is less than 1% of the total land area: this figure incorporates scattered patches of forest on mountain slopes, a few lowland forests in the mountain foothills, coastal forests and mangrove swamps. Although small in area, these forests are of great importance ecologically and in terms of biodiversity - the eastern mountain and coastal forests

contain large numbers of endemics which are attracting increasing interest. The mountains are also an important water catchment area and the forest cover needs to be maintained to safeguard regular runoff (Bensted-Smith and Msangi, 1989). The Udzungwa Mountains are in the process of being gazetted as a national park and greater protection has been proposed for the Uluguru and Usambara mountains.

Lakes and swamps have been estimated to cover some 5.8% of the total surface area of Tanzania. This figure includes the wetland systems of the large lakes, as well as numerous smaller lakes, riverine flood plains, permanent swamps, tidal swamps and a number of artificial impoundments, but does not include the large areas of seasonally inundated floodplains (Hughes and Hughes, 1991). The wetlands, although extensive are generally poorly known in the country (Stuart and Adams, 1990). Following a joint IUCN/WWF mission to Tanzania in 1990, a national wetlands programme is now under discussion, and there are two pilot wetland management activities on the Kilombero floodplain and the Rufiji delta.

The coastline is characterised by large sweeping beaches, steep limestone cliffs, rocky headlands and elevated fossil reefs; fringing mangrove forests are widespread, particularly around river mouths and notably around the Rufiji River delta. About two-thirds of the country's coastline has fringing or patch reefs lying offshore. The big coastal islands, as well as the numerous small offshore islands, have fringing reef systems which are frequently better developed than those reefs close to the mainland. One major threat to the reefs is from extensive illegal dynamiting by fishermen, which has almost completely destroyed some reef ecosystems, notably around Dar Es Salaam. The destruction of reefs may in turn prove to be the cause of rapid and severe beach erosion along part of the coast. Another threat comes from the trampling of reefs by net fishermen. Potential threats in the future may come from increased pollution and siltation affecting the reefs. A number of marine reserves were designated in 1981 under the 1974 Wildlife Conservation Act. However, they have never been implemented, nor have appropriate regulations been drawn up (UNEP/IUCN, 1988). There are proposals for the creation of a marine national park, and it is hoped that one may be established before the end of 1991 (Foya, pers. comm., 1991).

Game reserves were first established under German colonial rule prior to World War I, and by 1914, 13 such reserves existed. After 1918, the British government continued this process, establishing Selous Game Reserve in 1922 and Serengeti Game Reserve in 1929. Game controlled areas were established in 1946 when tourist hunting was formalised. The present network of national parks, game reserves and game controlled areas was structured after World War II, with Serengeti National Park being gazetted in 1951, followed by Lake Manyara and Arusha national parks in 1960 (WD, 1991). The protected areas network currently comprises

national parks, Ngorongoro Conservation Area, game reserves, forest reserves (130,240 sq. km), and game controlled areas (106,765 sq. km), which together cover nearly 40% of Tanzania's surface area. Of the forest reserves, 70,020 sq. km. serves a production function, while forest reserves covering 60,220 sq. km serve a protection function (WD, 1991). Currently, there are no partial game reserves. Some 4% of the national budget is spent supporting this protected area system. Ongoing management activities include a reassessment of protected areas which may lead to the upgrading or downgrading of previously declared protected areas, work towards the creation of a marine national park, and efforts to increase public support for the protected areas system both from local communities close to the parks themselves and wider national support by encouraging their recreation value. The need for management plans to be drawn up for every protected area is recognised; at present only the Serengeti has such a plan (Foya, pers. comm., 1991).

Current multi-agency projects include: the planning and development of marine and terrestrial protected areas; support for the College of African Wildlife Management; provision of assistance to the Wildlife Division; the development and implementation of the Tropical Forestry Action Plan; the development of the Tanzania national parks master plan; and preparatory work for a National Conservation Strategy (Stuart and Adams, 1990). In addition, the African Wildlife Foundation is assisting Tanzania National Parks to develop a Community Conservation Service; FINNIDA is involved in the Zanzibar Forestry Development Project and Zanzibar Integrated Land Use Project; FZS is involved in wildlife surveys and monitoring in all wildlife areas, and assists in protected areas management; and WWF has been involved in a number of conservation initiatives. IUCN-supported projects include the Serengeti Regional Conservation Strategy, the Ngorongoro Conservation Area and Development Project and the Tanzania National Park Planning Project.

Proposals to improve the protected area system are given in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). A number of other reports, such as ITC (1989), EEC/WWF (1989), Poole (1990) and Clarke (1990) have looked at the wildlife sector in considerable detail (WD, 1991). Priority areas include: the establishment and effective management of protected areas in the montane and lowland forests, montane grassland, Itigi Thicket, the area around Lake Rukwa, the protection of freshwater lakes, Fungu Kisimkase (Latham Island), a number of swamp areas, the coastal and marine zone, including mangroves and coral reefs, and the establishment of protected areas on Zanzibar and Pemba (IUCN, 1987; Stuart and Adams, 1990). It has also been suggested that game controlled areas be reorganised into wildlife management areas with full local participation (WD, 1991).

A number of projects have been proposed under the auspices of the Elephant Conservation Plan. These

include: community wildlife management projects in a number of areas/ecosystems; support for wildlife management training; the development of a geographical information system (GIS) for wildlife management planning; updating of wildlife conservation laws; support for the Malihai Clubs of Tanzania; and institutional support for wildlife conservation, among others (WD, 1991). Further, the Report on the Conservation of Ecosystems and Genetic Resources under the Tropical Forestry Action Plan (Bensted-Smith and Msangi, 1989) contains a "Conservation Action Plan", drawn up for forest areas, which includes a number of projects for certain key areas, notably closed forest and mangrove forest.

Mwalyosi (1986) lists the major environmental problems to date. These include loss of top soil and lowering of productivity, notably in the high population areas, which frequently leads to increased deforestation and expansion of agriculture to other areas. Deforestation is itself a major problem; wood is one of the major energy sources in the country, but demand has already greatly outstripped sustainable supply. Other problems listed include: destruction of marine habitats; urbanisation and pollution. Within protected areas specifically, there are conflicts between the needs of the parks and of the local people as populations increase; the loss of wildlife continues as a result of human encroachment into protected areas and of poaching pressure, particularly on elephant and rhino; there is also some concern about the ecological viability of some of the parks as land use changes around their perimeters (Mwalyosi, 1986). The management of wildlife in multi-use zones outside protected areas has not been very successful, and means of integrating human and conservation interests have not as yet been found (Stuart and Adams, 1990).

The seven marine reserves specified in the 1975 Fisheries Regulations have received little attention since their designation, and these areas appear to receive little protection. There are 49 game controlled areas where unauthorised hunting is prohibited, but as there is no control on land use this is largely ineffective as a conservation measure.

Other Relevant Information Tanzania earns over US\$ 70,000,000 in foreign exchange from wildlife, in the form of tourism, sport hunting, live animal trade, and, formerly, from ivory (ITC, 1989).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: The Wildlife Conservation Act

Date: 1974 (major amendment in 1978, last amended in 1990)

Brief description: Makes provision for the protection, conservation, development, regulation and control of flora and fauna products, and allows

for the establishment of game reserves and game controlled areas.

Administrative authority: Division of Wildlife (Director)/Ministry of Tourism, Natural Resources and the Environment

Designations:

Game reserve No person, other than a resident of the reserve, or a person travelling through the reserve on a highway, may enter a reserve without the written authority of the Director, given in advance. Weapons may also not be taken into the reserve without the written authority of the Director. No person shall start a bush or grass fire, or fell, cut, burn, injure or remove any tree, shrub, bush, sapling, seedling or part thereof. Livestock may not be grazed in game reserves.

The following restrictions apply both to game reserves and to game controlled areas: no person may hunt, capture, kill, wound or molest any animal (including fish) in any game reserve. No person may dig, lay, or construct any pitfall, trap, snare or other device whatsoever, capable of killing, capturing or wounding any animal, or may carry any weapon which is believed by the Director to be intended for the purpose of hunting, killing, wounding or capturing of an animal. Written permission may be obtained from the Director, enabling persons to undertake some of the restricted activities mentioned in the previous two paragraphs. The Act also describes the penalties for the contravention of the aforementioned activities.

Game controlled area Restrictions in these areas are also applicable to the game reserves and are listed in the second paragraph under the game reserve section. There are no restrictions which apply to game controlled areas and not to game reserves.

Partial game reserve No person may hunt, capture, kill, wound or molest any protected animal without permission of the Director previously sought and obtained. Penalties are described for offenders.

Source: Original legislation

Title: The National Parks Ordinance (No. 12); The National Parks Regulations; The National Parks (Amendment) Regulations

Date: 1959; 1970; 1977

Brief description: Provides for the designation, administration and management of national parks, including detailed regulations concerning activities within parks.

Administrative authority: Tanzania National Parks (Director)

Designations:

National park This is the highest category of protected area, where absolute protection of the environment and all wildlife species is legislated.

Prohibited activities include: settlement; grazing; or cutting of vegetation.

Regulations cover the fees payable for entry permits for people and vehicles, camping in official campsites and elsewhere, the landing of aircraft and guide fees. Fees are also given for cinematography and still photography.

Sources: National Parks Regulations, 1970; National Parks (Amendment) Regulations, 1977; WD, 1991

Title: Forest Ordinance

Date: 1982

Brief description: Provides, among other things, for the designation of state forest reserves, provisional state forest reserves and local authority forest reserves.

Administrative authority: Division of Forestry and Beekeeping (Director)/Ministry of Tourism, Natural Resources and the Environment

Designations:

State forest reserve Land within may be exchanged for land outside the area, under the authority of the Minister; land acquired under such an exchange shall become a part of the reserve, while that given away shall lose this title. The area of a state forest reserve may be altered, two such reserves may be amalgamated or one such reserve split into two by order of the Minister. Licences for tree felling may be granted by the Director of Forestry: there are minimum breast height diameters for different tree species and tree groups.

Management plans must be produced for state forest reserves and provisional forest reserves – for the management, development, establishment or other use of these reserves.

Maps of all state forests, provisional forests, and local authority forests must be certified and registered by the Director of Surveys and shall be deposited in the Head Office of the Forestry Division before the declaration of such forests. Areas may only be declared if the proposed declaration has been well publicised ninety days prior to the declaration, and area commissioners for all the relevant areas are informed. All claims to rights in relation to land or to forest produce must be investigated and determined – agreement must be reached concerning the continued existence of these rights or the compensation for their loss. The Director of Beekeeping may, in consultation with the Director of Forestry, make Beekeeping Development Laws to be used within the state forest.

Provisional state forest reserve Areas of maltreated land or land liable to deterioration by maltreatment may be declared as state forest reserves for the purpose of land improvement or land reclamation or forest development. Most other restrictions and regulations are similar to those for the other forest reserve categories.

Local authority forest reserve They are declared by the local authority in consultation with the Director of Forestry. They may be in any area of state controlled forest or any area of forest under their own jurisdiction. Many of the other regulations and restrictions are similar to those for the other forest reserve categories. The maintenance, control and management of all these forests is under the jurisdiction of the local authority, management costs or revenues derived also fall to the local authority. The management of these forests may be taken from the local authorities by the minister after considering a written report by the Director of Forestry concerning the mis-management of such areas. They may also be converted to State forest reserves by the Minister under certain circumstances.

Source: Schmithüsen, 1986

Title: The Fisheries (Marine Reserves) Regulations

Date: 1975

Brief description: Schedules to the Regulations define seven marine reserves, the remainder covers restrictions and regulations and deals with offences concerning these reserves.

Administrative authority: Fisheries Division (Director)/Ministry of Tourism, Natural Resources and Tourism

Designations:

Marine reserve No person, unless authorised by the director shall fish or collect other marine organisms in a marine reserve. No person, other than tourists, official visitors, residents and authorised personnel may enter marine reserves. No person shall damage or destroy the biological or physical environment either terrestrial or marine, in the reserve. Other activities are also restricted, including the use of boats and mooring activities. Dredging, excavating and drilling are also prohibited. Fines and prison sentences are covered dealing with offences in marine reserves.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Arusha	II	13,700	1967
2	Gombe	II	5,200	1968
3	Katavi	II	225,300	1974
4	Kilimanjaro	II	75,575	1973
5	Lake Manyara	II	32,500	1960
6	Mahale Mountain	II	157,700	1985
7	Mikumi	II	323,000	1964
8	Ruaha	II	1,295,000	1964
9	Rubondo	II	45,700	1977
10	Serengeti	II	1,476,300	1951
11	Tarangire	II	260,000	1970
	<i>Game Reserves</i>			
12	Biharamulo	IV	130,000	1959
13	Burigi	IV	220,000	1980
14	Ibanda	IV	20,000	
15	Kilimanjaro	IV	90,000	
16	Kizigo	IV	400,000	
17	Maswa	IV	220,000	1969
18	Mkomazi	IV	100,000	1951
19	Mount Meru	IV	30,000	
20	Moyowosi	IV	600,000	1982
21	Rumanyika	IV	80,000	
22	Rungwa	IV	900,000	1951
23	Saadani	IV	30,000	1968
24	Selous	IV	5,000,000	1922
25	Ugalla	IV	500,000	1964
26	Umba	IV	150,000	1974
27	Uwanda	IV	500,000	1971
	<i>Conservation Area</i>			
28	Ngorongoro	VIII	828,800	1959
	<i>Forest Reserve</i>			
31	Udzungwa	IV	120,000	1959
	<i>Biosphere Reserves</i>			
	Lake Manyara National Park	IX	32,500	1981
	Serengeti-Ngorongoro	IX	2,305,100	1981
	<i>World Heritage Sites</i>			
	Mt Kilimanjaro National Park	X	75,575	1987
	Ngorongoro Conservation Area	X	828,800	1979
	Selous Game Reserve	X	5,000,000	1982
	Serengeti National Park	X	1,476,300	1981

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Tanzania

TOGO

Area 56,790 sq. km

Population 3.7 million (1990)

Natural increase: 3.6% per annum

Economic Indicators

GDP: US\$ 398 (1987)

GNP: US\$ 370 (1988)

Policy and Legislation Legislation currently providing for protected areas and forest reserves comprises an Environment Code (code de l'environnement), which provides for environment protection zones (see Annex), and a new Forest and Fauna Code (Code de la Forêt et de la Faune) due to be finalised in the near future (K.M. Tengue, pers. comm., 1991).

Existing protected areas comprise faunal reserves and classified forests, in which all exploitation, other than the collection of water and dead wood, is strictly prohibited. A further legally defined category of reserve is the strict hunting reserve (réserve intégral de chasse), which is totally protected with access by permit only (although scientific and economic research is allowed). There appears to be no legal basis for national parks or reserves, which are classified as faunal reserves or integral hunting reserves, although stricter protection is afforded to those areas designated as such.

The Environment Code was promulgated by Act No. 88-14 of 3 November 1988 (instituant code de l'environnement) (see Annex). Before this, Togo had no cohesive and appropriate body of legal rules in the environmental field. Existing legislation was too old and had become obsolete in the face of the economic and demographic evolution of Togolese society, whilst at the same time technological innovations had created new ecological problems. This had resulted in the widespread degradation of the natural and urban environment. The Act comprises 13 titles including those on classified establishments for environmental protection and the protection of wildlife, natural areas and sites. Forestry has not been included in the Environment Code, as its management was considered to require specific legislation in the form of a comprehensive forest code. The Act also makes provision for the financial support of environmental action, in the form of an environmental fund. This is a special account for the exclusive funding of environmental improvement or rehabilitation operations (Anon., 1989).

International Activities Togo has ratified the 1968 Algiers Africa Convention. It is not party to the Convention concerning the protection of the World Cultural and Natural Heritage (World Heritage Convention), nor the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and does not have any

sites inscribed under the Unesco Man and the Biosphere (MAB) Programme.

Administration and Management All protected areas in Togo are being reassessed, hence all current relevant information can only be considered provisional. Previously the interests of local people had not been taken sufficiently into account, so all available data on protected areas is being reviewed, with the aim of redefining limits and management objectives. Exterior assistance, both financial and technical is needed to achieve this (K.M. Tengue, pers. comm., 1991).

Currently, the Department of Forests, Hunting and the Environment (Direction des Forêts, des Chasses et de l'Environnement) within the Ministry of Environment and Tourism (Ministère de l'Environnement et du Tourisme) is responsible for administration and management of national parks and faunal reserves. Various divisions (environment, fauna, planning, operation and legal) within this department play a role in the administration of the protected areas. There are apparently no formal management plans for the reserves, although there are regional planning offices.

The Ministry of Rural Development is involved in the development and exploitation of both natural and planted (teak) forests, and casual cutting outside reserves.

An agreement was signed between the F. Weber Convention and the government on 25 May 1990. This conferred on the Convention the management of Fazao-Malfakasa Faunal Reserve and the reserve hotel for a period of 25 years. Numerous projects are planned for the reserve: creation of tracks and water points; recruitment of extra guards; development of an animal orphanage; acquisition and transfer of animal species within the park; work and research by universities and programmes to popularise the park amongst local populations (Bleich, 1991).

The government is strongly committed to the conservation and rational utilisation of the country's natural animal and plant resources. This is illustrated by the recent creation of Oti Valley Faunal Reserve in the north-east, and strict control of illegal hunting and burning, which is very effective. As a result, hunting pressures are lower than in most other West African countries with comparable human densities. Fines and long prison sentences are imposed for burning or for killing wildlife in protected areas (Chardonnet *et al.*, 1990).

Keran National Park receives a high level of protection and management, including regular anti-poaching activities, provision of artificial watering places, and controlled burning (Chardonnet *et al.*, 1990). The level

of protection within Fazao-Malfakasa National Park is not as high and there is a need for increased anti-poaching measures (Portas and Sourmia, 1985). Unfortunately in 1989 gold-mining spread rapidly downstream along the Mo River and considerable numbers of miners are working inside the national park, and especially in Malfakassa Reserve. Serious damage has already been done to the riverine habitat (Chardonnet *et al.*, 1991).

Systems Reviews Togo is a roughly rectangular country, 551km long and approximately 100km wide, with a coastline of 50km. It is divided from south-west to north-east by a 350km chain of mountains (Chaîne de Togo), part of the Atakonian Range which extends eastwards into Benin. The Chaîne de Togo comprises a string of isolated peaks, rising to a maximum altitude of 1,000m. The mountains are extensively faulted, and divided by deep valleys into plateaux with abrupt edges and rugged topography. Two large alluvial plains occur on either side of the range. To the south is the Mono plain, drained by the Mono River. At the coast, the plain is sandy and contains freshwater lakes, typical of the Gulf of Guinea. The plain rises gently to the 100m contour some 40km inland. This undulating slope then continues northwards to the 200m contour at the Chaîne de Togo, 100km inland. To the north of the mountains is the Oti plain, drained by the Oti (Pendjari) River, a tributary of the Volta which crosses the country from Burkina Faso to Ghana (Anon., 1990).

Despite its location in the humid tropics, favourable for forests, Togo is one of the few countries in the west African region on the Gulf of Guinea with no important forests, although evidence indicates that historically almost all the country was wooded. Population pressure has been responsible for radical modifications in appearance and composition of forest vegetation throughout the country (Nadjombe, 1990). Some dense degraded montane forest occurs in the south-west of the country. In the south-east and centre there are large and small pockets of semi-deciduous forest as well as forest galleries along the main river beds. In 1970, just over 20% of the country was forested. Comparison of data from FAO from 1970 and 1979-1980 suggests a deforestation rate of 15,000ha a year. Data giving the current extent of forest cover do not exist (K.M. Tengue, pers. comm., 1991). However, on the base of appearances, 70% of the country is currently covered by savanna (Nadjombe, 1990). Wooded savanna occurs in the centre and extensive areas of Sudanian savanna occur in the central and northern regions (Anon., 1990; Chardonnet *et al.*, 1990). Togo has no mangroves of significance, nor are there any coral reefs. The wetlands comprise coastal lagoons enclosed by reed swamps and seasonally inundated lands. Flood plains occur along most rivers because of the highly seasonal nature of the rainfall. In the mountainous central part of the country, the flood plains are narrow, often only strips 25-50m wide, but in the north they are much better developed and occur in wide valleys. These are mostly dominated

by either Guineo-Soudanian transitional swamp forest or Soudanian swamp forest (Hughes and Hughes, 1991).

The economy of the country is principally based on agriculture. Cash crops were introduced at the turn of the century and really developed between the first and second world wars. Land use is influenced more by rainfall pattern than by temperature. In the highly-populated south, which has two wet and two dry seasons, cassava, maize, banana and oil palm tree are cultivated; in the centre where the climate is Guineo-tropical, with one wet and one dry season, subsistence crops such as millet and sorghum are gradually giving way to coffee, cotton, peanut and cocoa plantations (Bleich, 1991; Nadjombe, 1990; Portas and Sourmia, 1985; K.M. Tengue, pers. comm., 1991).

Togo has three national parks, nine faunal reserves and 54 forest reserves. These protected areas cover 14% of the country and represent most major habitat types, except lowland rain forest which is already very depleted. The two large national parks are representative of the two principal ecosystems in the country: Keran National Park comprising Sudanian savanna, whereas Fazao-Malfakasa includes Mont Togo, and is the only west African park representative of a semi-mountainous tropical humid ecosystem. Fazao-Malfakasa, gazetted a national park in 1975, formerly comprised two forests, Fazao and Malfakassa which were classified in 1951. Keran National Park was created in an identical manner. The small Keran Classified Forest, delimited in 1950 was enlarged the first time in 1971, and gazetted a national park. Following this a second extension was created in 1975/6 and finally a third in 1982, which altered the north-east limits to incorporate an important part of the Oti valley. The recent establishment of Oti Valley Faunal Reserve brings the protected areas of northern Togo very close to the important Pendjari National Park of Benin and contiguous protected areas of Burkina Faso (Chardonnet *et al.*, 1990). The protected areas include 80% of remaining forest, many of which, however, exist only in name. Reports suggest that only 12 out of a total of 66 protected areas are effectively protected (Anon., 1990; Nadjombe, 1990; Portas and Sourmia, 1985).

Recommendations to improve the protected area system are given by Nadjombe (1990), Chardonnet *et al.* (1990), IUCN (1987), MacKinnon and MacKinnon (1986) and Portas and Sourmia (1985). These recommendations include: the application of a management plan for Keran National Park; extensions to the existing system; improvements in protection and management of existing reserves; preparation of national land use and conservation strategies; implementation of legislation for the establishment of national parks and nature reserves and the development of a conservation programme to increase public awareness of the value of protected areas and conserving wildlife. They further state the need for international assistance in the fields of planning and training.

The main threats to protected areas come from poaching, forest fires and illegal land clearance. Togo also faces a serious problem from desertification (MacKinnon and MacKinnon, 1986; Portas and Sourmia, 1985).

Addresses

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Code de l'environnement (Environment Code)

Date: 3 November 1988

Brief description: Provides *inter alia* definitions of environment protection zones.

Administrative authority: Ministre chargé de l'Environnement (Minister of the Environment)

Designations:

Zone d'environnement protégée (Environment protection zone) For the protection of:

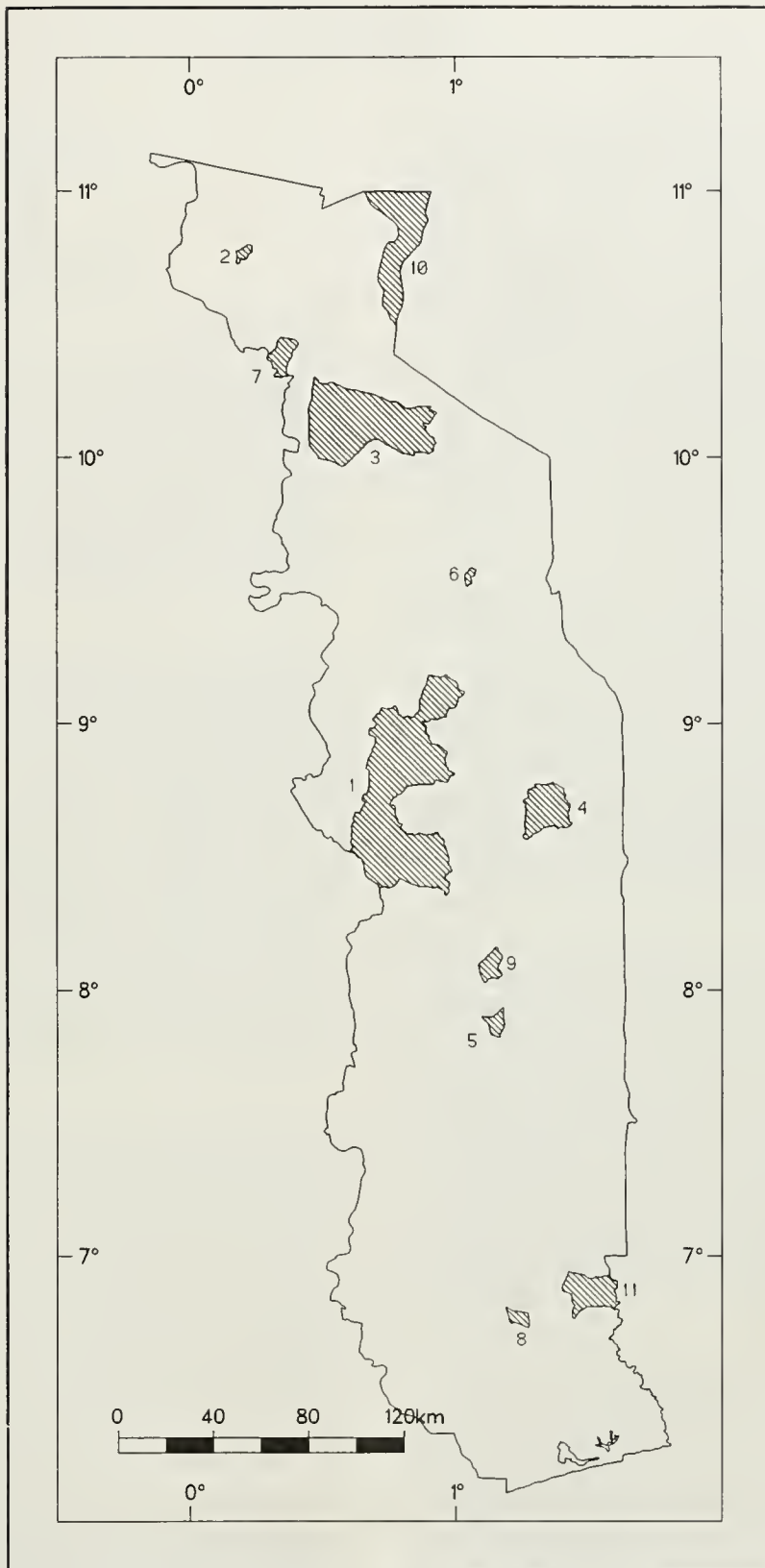
monuments, sites and landscapes; geological formations, coast and soil; water systems and water quality; forests and wooded areas; fauna and flora.

Within the zone the Minister responsible for the environment may: prohibit, limit or regulate activities incompatible with the zone; implement restoration programmes for the natural environment or monuments; approve management plans defining methods of attaining the objectives assigned to each zone.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Fazao-Malfakassa	II	192,000	1950
2	Fosse aux Lions	II	1,650	
3	Keran	II	163,640	1950
	<i>Faunal Reserves</i>			
4	Aboulaye	IV	30,000	
5	Akaba	IV	25,626	
6	Djamde	IV	1,650	
7	Galangashie	IV	7,500	
8	Haho-Yoto	IV	18,000	
9	Kpessi	IV	28,000	
10	Oti Mandouri	IV	147,840	
11	Togodo	IV	31,000	1952



Protected Areas of Togo

UGANDA

Area 236,580 sq. km

Population 18.0 million (1990)
Natural increase: 3.6% per annum

Economic Indicators

GDP: US\$ 148 per capita (1987)

GNP: US\$ 280 per capita (1988)

Policy and Legislation At a national level, the central government has initiated a plan to develop a conservation strategy in conjunction with UNEP and IUCN which, *inter alia*, will promote the achievement of forest conservation objectives (Howard, 1988; Struhsaker, 1987). In recent years, environmental impact assessments (EIAs) have been undertaken for projects impacting on forest management. Further, the enactment of legislation for inclusion of EIAs with any large-scale development project is currently being reviewed (IUCN, 1990).

The National Parks Act of 3 April 1952 (Cap 227) is a parliamentary Act providing for the establishment of national parks for the dual purposes of protection and preservation of wild animal life and vegetation, and for the use and benefit of the Ugandan people and foreign visitors (IUCN, 1990; Olivier, 1990) (see Annex). The Act allows for the creation of bye-laws specific to individual parks which define management policy for such areas (Olivier, 1990). Exploitation of forest products within a national park requires permission from the National Parks Board and Forest Department. National parks can only be created or abolished by an Act of Parliament, and this category affords the highest conservation status which may be accorded to any particular area. All other conservation areas may be gazetted or degazetted by the Minister responsible for wildlife.

Legislation dealing with the establishment and management of game reserves stretches back to 1902 when the government of the day sought to ensure the survival of unusual terrestrial fauna. A Commissioner, appointed with approval of the Secretary of State, was given authority to declare suitable territory to be a game reserve (Corson and Kux, 1982). The Game Preservation and Control Act, 1959, amended in 1964, governs controlled hunting areas, game reserves and sanctuaries (see Annex). Game reserves are exclusively managed for wildlife, whereas in game sanctuaries and controlled hunting areas, multiple land use is permitted by legislation (Okua, 1991). In 1979, a law was passed which banned hunting in all parts of the country.

The Forest Act, 1947 (Cap. 246), amended in 1964, provides for the establishment of central and local forest reserves, village forests and, by virtue of Paragraph 13, nature reserves, on public land (Howard, 1988) (see Annex). The Act also makes provision for prohibited

activities and penalties, responsibilities and authority of forest officers, licensing procedures for forest produce, and protection of forests. The Act provides for the appointment of a Chief Conservator of Forests and outlines the procedure involved in the gazetting and degazetting of such reserves. Nature reserves are afforded a higher degree of protection than forest reserves in which they are found and are generally surrounded by buffer zones (see Annex). Several forest reserves have dual status as game reserves, animal sanctuaries or national parks. These areas are subject to additional regulations as are contained within the Game Preservation and Control Act, 1964 and the National Parks Act, 1952, respectively. Under these regulations, it is an offence to reside in, cultivate or graze livestock in any of these reserves (Howard, 1988).

A reserve category, recently created by the Forest Department, is site of special scientific interest (SSSI). SSSIs do not satisfy the normal criteria for designation as strict nature reserves, but nevertheless represent unique ecosystems. They are established to protect sites of special interest that may have been altered by past management but represent the only remnants of unique or threatened ecosystems (Tabor *et al.*, 1990; Kiwanuka, pers. comm., 1991). A second type of reserve being considered for creation is forest park (see Annex). Forest park is to be a multiple-use category with provision for amenity use, strictly protected nature reserves, and zones of sustainable harvesting (Kiwanuka, 1991; Tabor *et al.*, 1990).

The need for a new conservation policy with clear objectives for effective management of protected areas has been recognised by both Uganda National Parks and the Game Department. Policy objectives will include, *inter alia*: the preservation of faunal diversity; sustainable management of wildlife to benefit local communities; the promotion of conservation awareness; and encouragement of wildlife research in support of effective management (Okua, 1991). Although wildlife outside of reserves is owned by the government, it is intended that ownership will be transferred to the local people to enable them, with government support, to manage their wildlife in a manner similar to the CAMPFIRE programme in Zimbabwe (Uganda National Parks, 1991).

A forestry policy was first adopted by the government in 1929 and has since been revised three times. Initially, this policy emphasised the role of forestry in the protection of the environment, but shifted emphasis in the early 1970s towards short-term economic benefits from timber extraction (Forest Department, 1951, 1955; Hamilton, 1984). It was not until 1987 that a revised forestry policy was issued, marking a return to the importance of protective forestry (Kiwanuka, 1991). In this policy, emphasis is placed on the maintenance of

enough forest land to ensure sufficient supplies of timber, to allow for amenity and recreation, and to ensure the conservation of plants and animals in natural ecosystems. This policy also specifies that 20% of the total reserved forest area is to be conserved in strict nature reserves and a further 30% protected from intensive forms of forest management in buffer zones (Howard, 1988; Forest Department, pers. comm., 1990).

There are a number of shortcomings to protected areas policy and legislation. At a national level, there is a lack of legislation enabling the Ministry of Environment Protection to fulfil its mandate in influencing established ministries on the use and management of natural resources. There is a need to develop legislation which ensures that environmental considerations are given due weight in the planning process (IUCN, 1990). To date, no environmental legislation has been enacted to deal specifically with wetlands. To address this situation, the Ministry of Environment Protection is involved in a two-year wetlands programme, in collaboration with IUCN, to develop a management policy and enforcing legislation to manage wetlands on a sustainable basis (IUCN, 1990). The National Parks and Game acts, considered to be outdated, are currently being reviewed under an FAO programme (Pomeroy, 1990).

One of the major shortcomings of the Forest Act is that while licences are required to cut trees for timber or charcoal on public land outside reserve areas, a permit is not required for clearing forest for agriculture. To halt clearing outside reserves, there is an urgent need for a government management policy regarding public land forests (Struhsaker, 1987).

International Activities Uganda is party to a number of international conventions concerned with protected areas, namely the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) accepted on 20 November 1987, and the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), ratified on 4 March 1988. To date, no natural sites have been inscribed on the World Heritage list. Lake George is the only wetland designated under the Ramsar Convention. Uganda participates in the Unesco Man and Biosphere Programme, under which one site was accepted as a biosphere reserve in 1979. At a regional level, Uganda is party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The management of wildlife inside and outside protected areas is the responsibility of the Ministry of Tourism, Wildlife and Antiquities (Okua, pers. comm., 1991). Four departments are found under this Ministry: Game; Antiquities; Tourism; and Uganda National Parks. A Board of Trustees, comprising a chairman, the Chief Conservator of Forests, the Chief Game Warden and 9-12 officers, oversees Uganda National Parks and has

full legal and administrative control over the national park system (Corson and Kux, 1982). The Director of Uganda National Parks is based in Kampala, with each national park being managed by a chief warden and a staff of wardens and rangers. This organisation currently operates with a budget of Ugandan shillings 9 million per month (Okua, pers. comm., 1991). The research arm of Uganda National Parks is the Uganda Institute of Ecology, whose role is to provide scientific and technical information for the effective management of the national park system (IUCN, 1990) and to prepare park management plans (IUCN/MEP, 1986).

A Game Department was first constituted in 1925. Today, this department administers all wildlife outside national parks, and is responsible for the management of game reserves, controlled hunting areas and game sanctuaries. The department is headed by a Chief Game Warden whose headquarters are at Entebbe. He is assisted by a deputy chief game warden, under whom are four senior game wardens, responsible for Development, Administration, Wildlife Estates, and Zoo and Transport, respectively; the senior game biologist, who has a staff of three game biologists; a senior game warden (HQ) and two regional senior game wardens. In addition, 17 game wardens are distributed throughout the country and are responsible for the day to day running of reserves. Junior staff include assistant game wardens, senior game assistants, game assistants, junior game assistants and game guards (Uganda National Parks, 1991). The Game Department has jurisdiction over wild animals in all forest reserves and maintains field staff in some of the larger reserves (Howard, 1988; IUCN, 1990).

The Forest Department within the Ministry of Environment Protection is responsible for the implementation of the national forest policy, and for the creation and management of forest and nature reserves. This department is also responsible for the protection of reserved trees outside forest reserves, research, extension work, and the periodic exploitation of forest products (Hamilton, 1984). The conservation of flora and fauna, particularly within nature reserves, is a paramount objective of the department (Kiwauka, pers. comm., 1991). The organisation of the Forest Department comprises a Chief Forest Office, a deputy, senior forest officers, foresters and a number of other support staff. Forest parks, which will fall under the jurisdiction of the Forest Department, will have a management committee composed of interested agencies, and an Advisory Committee composed of local authorities and community leaders (Kiwauka, pers. comm., 1991).

The Ministry of Environment Protection was created in 1986 and is responsible for coordinating the management of natural resources. The Ministry has also been assigned the task of guiding wetland development under the Wetlands Conservation and Management Programme. Objectives of this programme include an inventory of the distribution and status of wetlands, and

the development of a wetland reserve network (IUCN, 1990; Pomeroy, 1990). As of 1986, the Ministry suspended all major wetland drainage activities pending development of a detailed wetland policy. The three technical departments within this Ministry are Environment, Forest and Meteorology (IUCN, 1990). The Forest Department was moved from the Ministry of Agriculture and Forestry to the Ministry of Environment Protection in 1986 to enhance the Ministry of Environment Protection's ability to deal with forest destruction (IUCN/MEP, 1986).

There are a number of constraints to protected areas management. Years of political turmoil and economic instability have crippled the activities of Uganda National Parks and the Game and Forest departments. Low levels of funding, poor staff remuneration, lack of field equipment, physical threat from well-armed poachers in protected areas, a general decline in law and order, inability to enforce legislation, and a lack of adequately trained staff at all levels have hindered management efforts further. In the Forest Department alone, there were only 13 serviceable vehicles to support a staff of over 600 in 1986 (IUCN, 1990). Lack of protection and management of nature reserves has resulted largely from the national departments being ill-equipped to carry out the necessary action (Forest Department, n.d.). A general lack of adequate scientific and technical information on which to base management plans in game reserves and national parks is another constraint facing management authorities (IUCN, 1990). Further, a number of protected areas have not had clear boundary demarcation on the ground, and where management plans have been written, they have often been forgotten and never acted upon (Okua, 1991; Pomeroy, 1990). Almost all the forest "working plans" are now out-of-date and few records of forestry activity are kept (IUCN/MEP, 1986).

It has been suggested that a Wildlife Conservation Trust be established as a long-term strategy to strengthen the Uganda National Parks and Game Department. The Trust would be managed by a Board of Directors drawn partly from Uganda National Parks and the Game Department. It would be responsible to the Ministry of Tourism, Wildlife and Antiquities, and serve in a major advisory capacity (Pomeroy, 1990). A further possibility is the amalgamation of Uganda National Parks and the Game Department (Pomeroy, 1990). It has been recommended that a National Advisory Committee on Natural Resource Conservation be created. This inter-ministerial committee, comprising representatives from NGOs and donor agencies, has been endorsed by the Prime Minister's office and will report directly to this office (Pomeroy, 1990). Currently, research into specific management problems in and around protected areas has become more integrated and broad-based through collaborative efforts between the Makerere Institute of Environment and Natural Resources, Uganda Institute of Ecology, Ministry of Environment Protection, IUCN and WWF (Pomeroy, 1990).

Systems Reviews Uganda is bordered by Sudan to the north, Kenya to the east, Rwanda and Tanzania to the south, and Zaire to the west. Lake Victoria forms a large part of the eastern boundary. The country lies between the Central Rift and Eastern Rift systems, and to the north of the Lake Victoria basin. The whole of the country is situated atop the east-central African plateau, the average height of which is between 800m and 2,000m asl. The plateau, which is punctuated by mountains reaching upwards of 5,000m, has a number of lakes which give rise to the region's major rivers: the Albert Nile, Kagera, Katonga, Nkusi, Okok, and Victoria Nile (Corson and Kux, 1982).

In general terms, the natural communities can be considered as wetlands, forests and savannas in the ratio of 1:8:33. At a finer level, there are 11 forest types, two forest/savanna mosaics, two swamp forests and approximately 60 savanna types (Pomeroy, 1990). The biogeographic affinities are predominantly Lake Victoria regional mosaic, with Sudanian in the northern third of the country, Somali-Masai in the extreme north-east, Guinea-Congolian in the southwest, and Afromontane in the mountains (Stuart and Adams, 1990).

At the turn of the century, forests covered approximately 12.7% of the country's total area. Today this figure is thought to be around 3%, with very little remaining outside government forest reserves (Hamilton, 1984; Struhsaker, 1987). Deforestation was particularly severe between 1970 and 1985 when government control over the forests deteriorated (IUCN/MEP, 1986). A high population density and growth rate along with the conversion of forested lands for agricultural purposes have been contributing factors (WWF, 1986).

Wetlands occupy approximately 10% of total land area, with open water bodies, including lakes Victoria and Albert, accounting for another 15% (Pomeroy, 1990). Currently, open water and wetlands remain largely unprotected. Only about 2% of wetlands are afforded protection within the reserve network (Pomeroy, 1990). Threats to the wetland resource include agricultural conversion, drainage activities, industrial pollution and excessive harvest of natural products (IUCN, 1990).

The establishment of forest reserves dates back to the beginning of this century, when the British Protectorate government signed agreements with the kingdoms of Buganda, Toro and Ankole, whereby forest lands became the property of the Protectorate government (Howard, 1988). It was not until 1932, however, that most of the country's forest reserves were formally gazetted, totalling 3,657 sq. km (Forestry Department, 1951). It took a further two decades to demarcate the boundaries as they are more or less today. In the 1950s, many smaller areas were also gazetted as local forest reserves, which in 1967 were brought under the control of the centralised Forest Department (Howard, 1988). Today, there are about 1.53 million ha of gazetted forests in 740 reserves which cover approximately 6.5% of total

area (Kiwauka, pers. comm., 1991). These reserves are distributed such that 50% is in savanna woodland and forest plantation, 40% is in tropical high forest and 10% in montane catchment areas (IUCN, 1990). In addition, there are about 2,000 sq. km of private forests and an unknown area of residual forest on public land (IUCN/MEP, 1986). It has been estimated that only about 53% of forested land within reserves remains essentially undisturbed (IUCN, 1990).

The first nature reserves were prescribed in forest working plans in the mid 1940s. Currently, 12 nature reserves exist covering an area of about 45,000ha. The four established SSSIs cover roughly 3,500ha, while the two proposed forest parks will cover about 130,000ha when established.

The national parks were created out of well-managed and developed game reserves (Anon., n.d.). Two national parks were established prior to independence, while the first game reserve, Toro Game Reserve, was established in 1924 (Corson and Kux, 1982; Pomeroy, 1990). The remaining game reserves were created mostly in the 1960s (Pomeroy, 1990). Wildlife sector reserves, including national parks, game reserves, game sanctuaries and controlled hunting areas cover around 20% of the total area. Unfortunately, game sanctuaries and controlled hunting areas have provided only limited wildlife and habitat protection (Okua, pers. comm., 1991).

Uganda has a good system of national parks and reserves but the present network was gazetted before any analysis of ecosystems had been made (IUCN, 1990; WWF, 1990). Consequently, 36 of the 94 non-aquatic ecosystems (38%) are found in national parks, with an additional 23 in game reserves. Some of the remainder are given protection in forest reserves, while 25 ecosystems are totally unprotected or only have small portions within protected areas (Pomeroy, 1990). Protection of a number of savanna types and a variety of forest ecosystems are not protected within conservation areas (IUCN, 1987; Pomeroy, 1990). In addition, high altitude heath moorland and grass steppe are not protected in any current national park (Pomeroy, 1990).

Certain recommendations for action have been outlined in MacKinnon and MacKinnon (1986) and IUCN (1987). There is appreciation of the need to expand protected areas in natural forest ecosystems and to ensure their effective management. This has resulted in proposals to change the status of certain forest reserves to national parks and to afford total protection to important water catchment areas.

Complementing these recommendations is a three-year FAO/UNDP Wildlife and National Parks Project begun in 1988, which is reviewing protected area management and legislation, and is providing for the survey of protected areas with a view to the preparation and implementation of long-term master plans for national parks and a conservation strategy for other protected

areas (IUCN/MEP, 1986). To date, a management plan for Queen Elizabeth National Park has been produced with support from the EC, with others to be produced in due course (Pomeroy, 1990). A further expansion of the protected areas network could take place with the Forest Department's proposals to create national forest parks (Howard, 1988; Pomeroy, 1990). Another important initiative is the EC-funded Natural Forest Management and Conservation Project within the World Bank Forestry Rehabilitation Programme. This seven-year programme, begun in 1988, seeks to rehabilitate the forestry sector. The EC component of this programme supports the Forest Department in its goal to expand nature reserves from 5% to 20% of total reserved forest area (including savanna woodlands) and to designate a further 30% as buffer zones (Forest Department, pers. comm., 1990; Howard, 1988). Once achieved, nature reserves will extend to all the varied ecosystems within forest reserves and include medium altitude forest and the range of critical areas of biological diversity (Howard, 1988; Pomeroy, 1990). Other objectives of this project will be to conduct extensive inventories of floral and faunal resources and to revise management plans in forest reserves (Pomeroy, 1990). The National Rehabilitation and Development Plan 1988/89-1991/92 includes provision for the integration of wildlife management with rural development, and environmental education (Uganda National Parks, 1991).

Care International and WWF-US are cooperating in a conservation project which involves inventory work and the development of specific forest reserve management plans, particularly in south-west Uganda (IUCN, 1990). IUCN and the Ministry of Environment Protection, with funding from the Norwegian International Development Agency, have started a conservation project for the degraded forests of Mount Elgon, Kibale and Semliki (Harcourt, 1990).

Threats to the protected area system include: agricultural encroachment; settlement; illegal or unmanaged exploitation of timber and charcoal; an ever-increasing fuel wood demand; cattle grazing; pollution; and uncontrolled burning. National parks and wildlife sector reserves have been threatened by illegal poaching and a negative public attitude to wildlife conservation. These problems were compounded by political and economic instability in the 1970s and 1980s (Anon., n.d.; Corson and Kux, 1982; Okua, 1991; Pomeroy, 1990; Struhsaker, 1987).

Other Relevant Information With a measure of stability returning to the country, management constraints and threats to protected areas are being addressed. For example, all encroachers have recently been removed from forest reserves (Kiwauka, pers. comm., 1991).

Addresses

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- Uganda National Parks (Director), Ministry of Tourism, Wildlife and Antiquities, Plot 107, 6th Street, Industrial Area, PO Box 3530, KAMPALA (Tel: 41 256534/258351; FAX: 41 233708; Tlx: SIMBA)
- Game Department (Chief Game Warden), Ministry of Tourism, Wildlife and Antiquities, PO Box 4, ENTEBBE (Tel: 42 20073)
- Forest Department (Chief Forest Officer), Ministry of Environment Protection, PO Box 1752, KAMPALA
- Forest Department, PO Box 31, ENTEBBE (Cable: forestry entebbe)

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ANNEX
Definitions of protected area designations, as legislated,
together with authorities responsible for their administration

Title: National Parks Act

Date: 3 April 1952

Brief description: Provides for the establishment of national parks.

Administrative authority: Board of Trustees (Chairman)

Designations:

National park An area which provides for a high degree of protection for wildlife and natural vegetation.

Prohibited activities include settlement and other forms of land use.

No extractive resource use is allowed without the approval of the National Parks Board of Trustees.

Sources: Howard, 1988; IUCN, 1990; Olivier, 1990; Pomeroy, 1990

domestic stock, and the sustainable utilisation of resources.

Hunting is authorised (by special permit) in such areas under certain circumstances (e.g. stable wildlife populations).

Sources: IUCN, 1990; Okua, pers. comm., 1991

Title : Forest Act (Cap. 246)

Date: 1947, amended 1964

Brief description: Provides for the use of forest reserves and forest produce.

Administrative authority: Forest Department (Chief Conservator of Forests)

Designations:

Forest Reserve

Prohibited activities include grazing, camping, fish farming, the planting or cultivation of crops, the erection of buildings or enclosures, the construction of roads, the use of such areas for recreational, commercial, residential or industrial purposes, or the negligent lighting of fires without written authority from a senior forest officer.

Central forest reserve An area which may be declared by statutory order by the Minister.

The Chief Conservator may issue licences for the cutting, taking, working or removal of forest produce.

Prohibited activities generally as for forest reserves.

Local forest reserve An area which may be declared by statutory order by the Minister.

The appropriate local authority is responsible for maintaining and controlling such areas.

By statutory order, the Minister may direct that the Chief Conservator take control of such areas for their proper protection, control or management.

Local authority may issue licences for the cutting, taking, working or removal of forest produce and may make rules applicable to any local forest reserve which it maintains and controls with approval of the Minister.

Prohibited activities generally as for forest reserves.

Title: Game Preservation and Control Act (Cap. 226)

Date: 1959, amended 1964

Brief description: Governs controlled hunting areas, game reserves and sanctuaries

Administrative authority: Game Department, Ministry of Tourism and Wildlife (Chief Game Warden)

Designations:

Game reserve Established to protect national parks from encroachment; to protect rare species; to allow for protein production; to promote tourism; and to allow for research. Other uses are by authorisation of the Chief Game Warden.

Prohibited activities include travel within, grazing of livestock, cultivation or settlement.

Game sanctuary Permitted activities include human settlement, cultivation, the grazing of domestic stock, and the sustainable utilisation of resources.

Hunting is authorised (by special permit) in such areas under certain circumstances (e.g. stable wildlife populations).

Controlled hunting area Permitted activities include human settlement, cultivation, the grazing of

Village forest Any area within the jurisdiction of a local authority may be declared a village forest with approval of the Minister.

The control, management and utilisation of such areas is the responsibility of the local authority.

The local authority may issue licences for the cutting, taking, working or removal of forest produce.

The negligent lighting of fires is prohibited in such areas.

Nature reserve Any forest area may be declared closed to all forms of consumptive resource use at the discretion of the senior forest officer and therein be designated a nature reserve (Paragraph 13).

Areas within forest reserves which are set aside to preserve representative samples of ecosystems and to afford a higher degree of protection to flora and fauna.

Such areas receive minimal management interference and can be used for research, education and environmental monitoring.

Forest park (proposed) Such parks are to be established in areas with considerable conservation and/or landscape appeal and recreation value.

A multiple-use management area where 50% of the area would be protected against extractive resource use; mechanised exploitation would be prohibited and manual harvesting of forest products would be licensed and strictly regulated within designated areas.

Park guards would be responsible for enforcing regulations protecting both plants and animals.

Sources: Howard, 1988; Kigeny, 1988; Kiwanuka, pers. comm., 1991

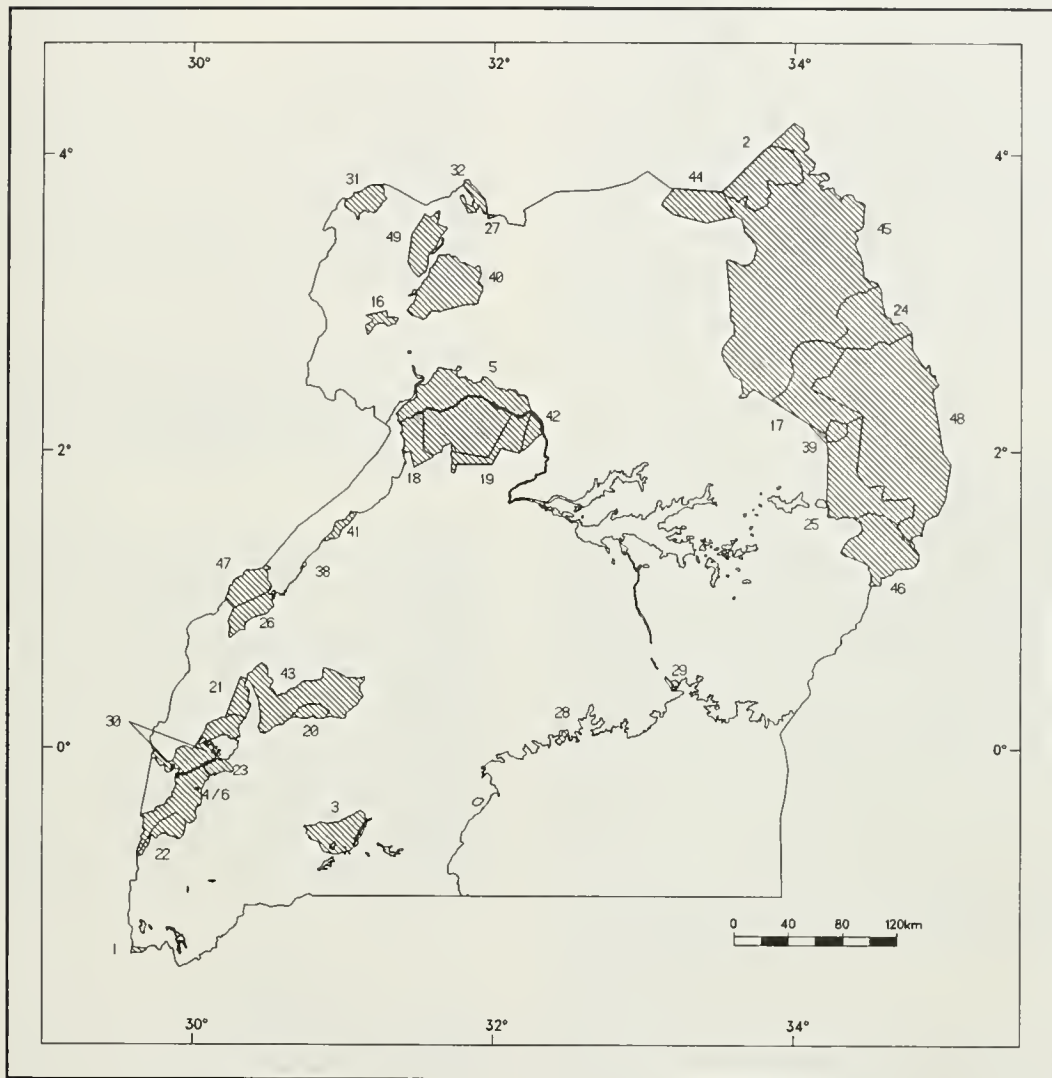
SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>National Parks</i>				
1	Gorilla (Mgahinga)	II	2,445	1991
2	Kidepo Valley	II	134,400	1962
3	Lake Mburo	II	53,600	1982
4	Mt Rwenzori	II	61,361	1991
5	Murchison Falls	II	384,000	1952
6	Queen Elizabeth	II	197,800	1952
<i>Nature Reserves</i>				
7	Igwe/Luvunya	IV	1,080	1989
8	Kasagala	IV	10,314	1976
9	Kisanju	IV	2,117	1960
10	Maruzi Hills	IV	6,829	1990
11	Ngogo	IV	7,200	
12	North Mabira	IV	3,355	
13	Waibira	IV	3,210	1989
14	Wambabya	IV	3,429	1989
15	Zoka	IV	6,084	1990
<i>Game Reserves</i>				
16	Ajai	IV	15,600	1962
17	Bokora Corridor	IV	203,363	1964
18	Bugungu	IV	74,830	1968
19	Karuma	IV	71,272	1964
20	Katonga	IV	20,662	1964
21	Kibale Forest Corridor	IV	33,915	1964
22	Kigezi	IV	38,232	1952
23	Kyambura	IV	15,514	1965
24	Manteniko	IV	158,656	1964
25	Plain Upe	IV	228,715	1964

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
26	Toro	IV	58,456	1929
	<i>Sanctuaries</i>			
27	Difule Animal	IV	1,024	
28	Entebbe Animal & Bird	V	5,120	
29	Jinja Animal	VI	3,261	
30	Kazinga Animal	VI	2,243	
31	Mount Kei White Rhino	IV	45,220	
32	Otze Forest White Rhino	IV	20,480	
33	Zoka Forest Elephant	VI	20,700	
	<i>Sites of Special Scientific Interest</i>			
34	Buto-Buvuma	V	1,096	1989
35	Kifu	V	1,419	1989
	<i>Forest Reserves</i>			
36	Mt Elgon	VI	119,536	1938
37	Zoka	VI	6,089	
	<i>Controlled Hunting Areas</i>			
38	Buhuka	VI	1,750	
39	Central Karamoja (Napak)	VI	22,451	
40	East Madi	VI	175,220	
41	Kaiso Tonya	VI	22,690	
42	Karuma	VI	24,061	
43	Katonga	VI	227,660	
44	Lipan	VI	89,856	
45	North Karamoja	VI	1,079,330	
46	Sebei	VI	253,490	
47	Semliki	VI	50,400	
48	South Karamoja	VI	798,470	
49	West Madi	VI	83,123	
	<i>Biosphere Reserve</i>			
	Queen Elizabeth (Rwenzori) National Park	IX	220,000	1979
	<i>Ramsar Wetland</i>			
	Lake George	R	15,000	1988

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Uganda

UNITED KINGDOM

BRITISH INDIAN OCEAN TERRITORY (BIOT)

Area 23 sq. km (Hunter, 1991)

Population No permanent population (Hunter, 1991)

Economic Indicators

GDP: No information

GNP: No information

Policy and Legislation The British Indian Ocean Territory (BIOT) was established by an Order in Council on 8 November 1965, having formerly been administered as a dependency of Mauritius. A joint treaty of 1966 was signed with the USA, resulting in the establishment of an US Naval Base on Diego Garcia; under this treaty agreement the whole of the BIOT is reserved for defence purposes, and in accordance with this treaty the territory is uninhabited.

Extant legislation relating to nature conservation includes the Protection and Preservation of Wild Life Ordinance 1970 and Wild Life Protection Regulations of 1984 under which bird sanctuaries have been established (Oldfield, 1987; UNEP/IUCN, 1988; Oldfield, pers comm., 1987).

Recommendations by the British Association of Nature Conservationists include: making a formal long-term commitment to conservation of the Chagos Archipelago, including the listing of the islands (excluding Diego Garcia) as a World Heritage natural site; giving protected area status to the small islands off the Great Chagos Bank and in particular to the Three Brothers and northern atolls; considering active conservation management for certain islands, especially the clearance of introduced species; stressing the importance of conservation to all visiting military personnel, and instructing the Ministry of Defence to prepare suitable briefing packs; and finally, carrying out a seabird survey (Oldfield, 1987).

Formal protection of the Chagos Islands has been recommended by Sheppard (1981).

International Activities Foreign affairs are dealt with by the United Kingdom. Although the Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was ratified by the United Kingdom on 29 May 1984, the BIOT was excluded from ratification and no sites were listed. The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) was ratified by the UK on 5 January 1976, but the BIOT was excluded from this. The BIOT is included in the UK's ratification of CITES and the Bonn Convention.

Recommendations for the BIOT to be recognised as a World Heritage site were made in 1983. However, it

appears that this could not be even considered at present because of legal complications arising from the 1966 Treaty Agreement (Oldfield, 1987; Salm, 1983).

Administration and Management The Territory is administered from the Foreign and Commonwealth Office in London by a Commissioner who is assisted by the representative, an officer-in-charge of the Royal Navy complement on the island of Diego Garcia (at the joint UK-US Naval Base). The part of the island not currently developed as the military base is a restricted area to which access is strictly controlled. Enforcement of conservation measures, such as for the existing bird sanctuaries, is the responsibility of the senior UK representative stationed on the island, in his role as Magistrate. In the 1988-1989 period the Overseas Development Agency of the UK provided no British Overseas Aid support to the BIOT.

Hunting of green turtle has been completely banned since 1968 (Frazier 1981).

Detailed scientific work, providing baseline data for effective conservation management research, was first carried out in the 1960s-70s by a number of organisations, individuals and joint services expeditions (see details in Stoddart and Taylor, 1971; Oldfield, 1987; UNEP/IUCN, 1988). In 1991 scientific work, involving conservation management, was due to be undertaken by the Marine Conservation Society of Great Britain, in conjunction with the Gaia Quest Trust, which was to provide boats and other logistical support (Anon., 1990). This was seen as the first phase in a series of coordinated programme research incorporating long and short-term projects (Anon., 1990; Wood, pers. comm., 1991).

There are no voluntary organisations specifically concerned with conservation and except for the military installation, the islands have been uninhabited since the removal to Mauritius of the 2,000 or so indigenous residents between 1965 and 1973 (Hunter, 1991; Oldfield, 1987).

Systems Reviews The BIOT consists of the Chagos Islands, lying over 3,380km east of the African coast, due south of the Maldives and due east of the Seychelles. The Chagos Archipelago consists of the central Great Chagos Bank and eight islands on its western and northern rim. It is surrounded by smaller atolls: Peros Banhos and Salomon to the north and Egmont and Diego Garcia to the south (Dinesen, 1977; Oldfield, 1987).

The Chagos Archipelago contains the largest expanse of totally undisturbed reefs in the Indian Ocean, with at least one endemic coral, brain coral *Ctenella chagius*, over 384 species of mollusc and 702 species of fish and

crustacean, including such species as the globally threatened coconut crab *Birgus latro*, which occurs on the Northern atolls and most of the islands of the Great Chagos Bank (for full details see UNEP/IUCN, 1988; Dinesen, 1977; Sheppard 1979, 1984). The vegetation of the main island has been substantially modified over the centuries. It consists of coconut groves (planted since the 1880s), woodland of *Casuarina*, *Scaevola* scrub, marshland and relict broad-leaved woodland of fig *Ficus*, *Morinda* and *Terminalia*. The smaller islands remain relatively undisturbed, and some still support isolated stands of original hardwood vegetation (see Fosberg and Bullock, 1971; Davis *et al.*, 1986).

The 1966 Treaty Agreement provides that the whole of BIOT be reserved for defence purposes of the UK and US governments. In accordance with this, the territory is uninhabited except for military personnel based on Diego Garcia. A feasibility study for restoring native vegetation was carried out during the 1978-1979 Joint Services Expedition (Sheppard 1981) and other work has been undertaken on corals, invertebrates and birds since the early 1970s (see Dinesen, 1977; Oldfield, 1987; UNEP/IUCN, 1988).

A checklist of insects of Diego Garcia is provided by Hutson (1981).

The Chagos Islands are considered internationally important for seabirds. There is one endemic bird race out of a total bird list of 50 species. They contain large breeding populations of 13 species (Bourne, 1971; Feare 1984; Hutson, 1975; Oldfield, 1987). The marine turtles include green turtle *Chelonia mydas* and Hawksbill *Eretmochelys imbricata*, with about 300 females of each species nesting annually. Leatherback turtle *Dermochelys coriacea* is a vagrant in the area (Oldfield, 1987; Groombridge, pers. comm., 1990).

Because of its military status, the whole of the BIOT acts as a *de facto* protected area. The three islands at the entrance of the lagoon are bird sanctuaries (Oldfield, 1987).

Past environmental concerns have largely been reduced with the depopulation of the islands. However, uncontrolled military construction continues to threaten areas of nature conservation importance. Such activities have included dredging and blasting for harbour constructions which caused localised coral destruction in the 1970s and as have construction of airfield facilities. Introduced domestic animals such as rats and cats continue to pose a significant threat to the natural ecosystem (Oldfield, 1987).

Addresses

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UNITED KINGDOM

ST HELENA AND ITS DEPENDENCY OF ASCENSION

Area 122 sq. km (Hunter, 1991) (St Helena)
88 sq. km (Hunter, 1991) (Ascension)

Population 5,443 (1990) (St Helena)
1,029 (1990) (Ascension)

Economic Indicators

GDP: No information

GNP: No information

Policy and Legislation The island of St Helena was administered by the East Indian Company from 1659 and became a British Colony in 1834. The dependent territory of St Helena is administered by a Governor, with the aid of a Legislative Council. The Island of Ascension has been a dependency of St Helena since November 1922 and Tristan da Cunha a dependency since January 1938 (for details on Tristan da Cunha see separate text).

Some of the earliest environmental legislation in St Helena dates from 1709 when an Ordinance was passed providing for enclosure against animals and replanting of woodland. In the 18th century various schemes were set in motion by the Island Council to protect timber supplies from destruction by goats, sheep and pigs (Cronk, 1986; Hearl, 1991).

The basis of the current protected area legislation is Forestry Ordinance No. 9 of 25 October 1954, which empowered the Forestry Advisory Committee and subsequently its successor, the Agricultural and Natural Resources Committee, to declare three categories of protected area: national forest, defined as any area of crown land; dedicated forest, any area of privately owned land under the control of the forestry officer and protected private forest (see Annex). The first site, Diana's National Forest, was constituted under Section 8(1)(a) of the Forestry Ordinance No. 9 of 1954 and No. 25 of 1955, No. 6 of 1957 and is mixed St Helena government property and Crown land. The Forestry Indigenous Trees and Plants Preservation Rules, 1959 detail plants to be protected wherever they grow on the island, and annexed amendments include all major endemic species. Other relevant legislation includes the Wildlife (Protection) Ordinance, 1984 and the Game and Wild Birds (Protection) Ordinance, 1950. The Crown Wastes are Crown property and are therefore protected from private development, and are covered by an ordinance against grazing animals of all kinds (Government of St Helena, *in litt.*, 1990).

The proposed environmental conservation policy aims to develop a sustainable island biosphere in which human influences play a symbiotic role, including through improved habitat management and application of conservation techniques, and to limit man's impact on

the biosphere, particularly where it encroaches on important ecosystems and habitats. Specific policy objectives include: establishing environmental recording systems, reproduction of endangered species, creation and maintenance of reserves, tree planting, environmental impact assessments (EIAs) of development proposals (see main United Kingdom text and obligations) and implementing new legislation (Director of Agriculture and Natural Resources, *in litt.*, 1991).

Ascension Local legislation includes the Wildlife (Protection) (Ascension) Ordinance, the Wildlife (Protection) Regulations, Endangered Species Control Ordinance, 1976, Green Mountain (Natural Resources) Protection Ordinance, 1955 and the Ascension Land Ordinance. Public notes are issued periodically to publicise aspects of conservation legislation. Marine turtles have full legal protection in Ascension (Oldfield, 1987).

At the 20th World Conference of the International Council for Bird Preservation, held in November 1990, a recommendation was made that "the Government of the United Kingdom designate Ascension Island a protected natural area" (Anon., 1991).

International Activities The Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was ratified by the United Kingdom on 29 May 1984, but no sites in St Helena nor Ascension have been inscribed. The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) was ratified by the United Kingdom on 5 January 1976: no sites have been inscribed in St Helena nor Ascension.

In 1987 a proposal was put forward to inscribe the 11ha of Diana's Peak and High Peak (St Helena) on the World Heritage list, but it failed to meet the criteria and was rejected on technicalities; the area was too small (Agriculture and Forestry Department, 1987). In 1991 proposals were handed to the Foreign and Commonwealth Office to establish St Helena as an internationally recognised biosphere reserve under the Unesco Man and the Biosphere Programme (Drucker *et al.*, 1991).

Administration and Management In St Helena conservation matters come under the administration of the Agricultural and Natural Resources Committee of the Legislative Council, which oversees agricultural, forestry and fisheries activities. The Overseas Development Agency (ODA) of the UK administers all British aid to St Helena. All major developments on the island, including projects in agriculture, fisheries and education, are overseen by the ODA South Atlantic and

Gibraltar Department; ODA gross bilateral aid in 1989 amounted to £26,603,000.

The Director of the Department of Agriculture and Natural Resources (ex the Department of Agriculture and Forestry) heads four divisions; the Agricultural, Research, Administrative and Forestry divisions. The department is responsible for implementing government agriculture and forestry projects, amongst others. Its recurrent expenditure in 1991 was £765,000 (Wilson, 1991). Conservation and management of forest reserves is largely the responsibility of the Forestry Division, established in 1943. The Forestry Division has ten forest guards who each patrol and carry out routine silvicultural activities in their respective districts (1991).

In 1991 a new position was due to be created, that of Conservation Officer under the Forestry Officer of the Forestry Department, who would be responsible to the Director of Agriculture and Natural Resources. Activities are to include: the coordination and implementation of the environmental conservation policy including the establishment of new reserves; the initiation and operation of appropriate environmental monitoring systems and data storage; devising and implementing specific projects which further advance environmental objectives; and assisting with the submission of environmental impact statements to the proposed planning authority (Department of Agriculture and Natural Resources, *in litt.*, 1991).

Activities of the Department over the nine previous years have focused on forestry and species conservation efforts and have involved the wider conservation community in addressing the environmental concerns of St Helena. Notable initiatives include an extensive habitat restoration policy, which incorporates the Endemic Plants Propagation Programme (EPPP). This programme has been set up to protect threatened plant species and their habitats, and over the last few years has been coordinated by the Agriculture and Forestry Officer (Benjamin *et al.*, 1986; Cronk, 1980, 1986). Funding has come principally from ODA and WWF-UK with participation of the Fauna and Flora Preservation Society and the British Council. Large-scale replanting has taken place and many of the plants which were literally on the verge of extinction have been rescued. Also under this programme foresters have undertaken four-month training programmes in collaboration with the Royal Botanic Gardens at Kew (Cronk, *in litt.*, 1991).

Under the EPPP project, areas of endemic vegetation are designated as endemic forest reserves to distinguish them from areas of new endemic planting and production forest (Department of Agriculture and Natural Resources, *in litt.*, 1990).

The St Helena Heritage Society is the main voluntary organisation on the island, and is taking an increasing interest in natural history. It has approximately 100 members and aims to awaken public interest in, and appreciation of the geography, history, natural history,

architecture and culture of the island (Hearl, *in litt.*, 1991). Non-government organisations based in UK have taken a strong interest in conserving St Helena's unique wildlife, the Fauna and Flora Preservation Society and WWF-UK have been active in promoting and instigating plant conservation on St Helena, together with the Royal Botanic Gardens at Kew and the British Section of ICBP. The St Helena working group of the NGO Forum for Nature Conservation in the UK territories was set up in 1991 with the express aim of seeking international recognition of the biodiversity importance of St Helena. Voluntary Services Overseas (VSO) activities have been proposed in order to support the environmental programmes of the Director of Agriculture and Natural Resources.

Ascension A warden is designated under the wildlife regulations with authority to license the taking and use of wildlife. The Ministry of Defence is involved in conservation activities through the military personnel on the island (Oldfield, 1987).

At the 20th World Conference of the ICBP, held in November 1990, a recommendation was made urging that a protected natural area be declared on Ascension and that a management plan be prepared to include the eradication of introduced animals (Anon., 1991). In 1991 proposals were underway through the ICBP British Section to undertake a feasibility study for pest eradication to protect the bird colonies. The Foreign and Commonwealth Office agreed to investigate the matter further (Wilson, pers. comm., 1991).

The Ascension Historical Society at Fort Hayes Museum has an interest in natural history and conservation. It also provides information on the South Atlantic islands of Ascension, St Helena and Tristan da Cunha, especially their unique natural history. It publishes the *Ascension Island Booklet*. Fort Hayes Museum has displays on geology, natural history and archive photographs (Hunter, 1991; Oldfield, pers. comm., 1991).

Systems Reviews St Helena is a British Dependent Territory situated in the South Atlantic Ocean. It lies some 1,960km from the nearest point on the south-west coast of Africa and 2,900km east of South America. The nearest land is Ascension over 700km away.

St Helena is the deeply eroded summit of a composite volcano which rises from the sea floor at a depth of 4,224m. The majority of the original vegetation has been almost entirely destroyed. Over 60% of the island is now covered by eroded areas of rock or prickly pear, aloe and other exotic species. Semi-natural forest covers less than 6% of the country in isolated remnants of the central mountain ridge. These remnants are of immense botanical and biogeographical interest, consisting of St Helena's endemic plants in their natural associations (Cronk *et al.* in Pearce-Kelly and Cronk, 1990; Drucker *et al.*, 1991).

Current vegetation types have been identified as follows: undamaged tree fern thicket; pasture, woodland and

cultivations of the uplands partly covered by gumwood *Commidendrum robustum*, *Chrysanthemoides-Diospyros* scrub and pasture zone; *Opuntia* scrub; *Lantana* scrub dominated by invasive *Lantana*; "Creeper" waste areas covered by mats of *Carpobrotus*; and semi-desert, which has very little vegetation but forms the eroding, barren Crown Wastes which were formerly covered with scrubwood *Commidendrum rugosum* (Cronk, 1986).

The native flora consists of about 60 species of flowering plants and ferns, 50 of which are endemic (10 plant genera). Of a total flora of about 320 species, some 240 species are naturalised aliens. Of the endemic species known to have existed, seven are now extinct, 23 are globally endangered and 17 are globally rare (Davis *et al.*, 1986; Pearce-Kelly and Cronk, 1990).

St Helena's original terrestrial fauna was dominated by birds and invertebrates. Both groups gave rise to unique and unusual forms due to the island's remote situation. The diversity of species has been enhanced by this isolation and the lack of competition from other animal groups. A checklist of the recorded fauna can be found in Drucker *et al.* (1991). There are a great many unique species: 12 endemic species of marine fish; an invertebrate fauna with 150 endemic insect species (including the world's largest earwig, an endangered species), at least one reptile (globally threatened hawksbill turtle) and the endemic globally threatened wirebird (World Heritage nomination, 1987).

Land use is broadly divided into forest with 673ha (5.6% of St Helena), flax with 335ha (2.8%), pasture with 1383ha (11.5%), scrub and barren land with 9041ha (75.2%) and arable land with 377ha (3.1%) (Wilson, 1991).

There is a continuous chronology of globally important scientific research, from Holly in 1676 to the earliest recorded plant species conservation measures 1718 and some of the first global environmental concerns in 1722, to the work of Joseph Banks, Buchell, and Hooker in the 19th century. Darwin undertook work on the island in 1832-36 and research has been undertaken subsequently, including seven major expeditions since the 1960s up to the current endangered plants propagation programme in association with the Royal Botanic Gardens, Kew, UK. Current and recent research includes the Fauna and Flora Preservation Society sponsoring scientists in 1980 to visit St Helena, where they rediscovered the St Helena ebony, a plant presumed extinct for over 100 years. Other examples of current work include the combined activities in plant conservation of the WWF-UK, Royal Botanical Gardens of Kew and the Agriculture and Nature Resources Department of St Helena.

Some of the many proposed areas for protection, other than the whole island itself, include High Peak and Diana's Peak as nominated for World Heritage status; Peak Dale Gumwood forest, the last site for populations of giant earwig and giant ground beetle; Horse Ridge Plot; fossil areas at Flagstaff Hill which were studied by

Darwin; Waterfall areas, the most scenically beautiful areas of inland St Helena; and protected landscape of the area around Lot and Lot's Wife, Sandy Bay (Drucker *et al.*, 1991).

During a one day symposium/workshop entitled "St Helena: Natural Treasury", held at the Meeting Rooms of the Zoological Society of London on 9 September 1988, The Regent's Park Declaration was endorsed by the participants and identifies the needs for future protection of the island (Pearce-Kelly and Cronk, 1990).

In 1990, the Director of Agriculture and Natural Resources identified four protected area sites, nature conservation reserves. These sites included Diana's Peak Forest Reserve, Hardings and Casons Forest Reserve, High Peak Forest Reserve and Horse Ridge Nature Reserve (Carter, *in litt.*, 1990).

In 1990 protected areas were zoned into 1,000ha of total productive forest for timber and fuel and 200ha as conservation forest areas. Conservation areas included areas of well established natural woodland and areas of "productive" woodland, established and maintained to prevent erosion and soil degradation (Carter, *in litt.*, 1990). The sizes of individually gazetted forest sites are as listed as follows: Diana's Peak Forest Reserve (1.3ha), Hardings and Casons Forest Reserve (24.6ha), High Peak Forest Reserve (4.9ha) and Horse Ridge Nature Reserve (7.1ha). There is also a 200-mile exclusive fishing zone (EFZ). At present as little as 6% of St Helena is protected as forest (Carter, *in litt.*, 1990; Wilson, 1991).

St Helena has been described as "the most devastated of all the tropical islands in the South Atlantic". Since the introduction of goats in 1513, and records of herds of 2km in length only 75 years later, the natural forest became reduced to its present remnants which subsequently became invaded by exotic plants. Major problems are erosion, caused by vegetation clearance by man for fuel, timber and agriculture, and changes in climate (loss of forest cover leading to reduced precipitation and a decrease in mist interception). The reported greatest single threat is from the spread of exotic species of plant, primarily the encroachment of *Acacia* and *Eucalyptus* (World Heritage nomination, 1987). Since 1875 authors have noted the declining populations and extinctions of endemic species. Many species and habitats unique to the island have vanished and many others are under threat of extinction (Pearce-Kelly, *in litt.*, 1990). Government efforts in the same period to improve the Flagstaff and Man and Horse commonages have been only partially successful largely because the administration has not consistently resisted pressure from Longwood and Blue Hill stock owners to hold down grazing fees and permit overstocking. A case can be made for closing a substantial part of the Man and Horse common for a recommended ten years, and Flagstaff also needs consistent attention (Pearce-Kelly and Cronk, 1990; Wilson 1991).

Ascension This is a small island of volcanic origin with a highest point of 860m on the Green Mountain Ridge, 700 miles north-west of St Helena, midway between Brazil and Africa. The vegetation has been substantially modified through the effects of introduced species and little is known of the original flora. Over 300 species of plant have been introduced. Currently, low altitude areas are barren with occasional grass clumps and the endemic *Euphorbia origanoides*. The lower slopes of Green Mountain are covered by thick scrub of introduced bushes and opuntia. There are 25 native vascular plants of which six ferns and five flowering plants are endemic (Cronk, 1980; Davis *et al.*, 1986; Duffey, 1964).

The main biological interest is the seabird breeding colonies, with over 100,000 birds consisting of four species of tern, three boobies, two tropic birds, one storm petrel and the globally threatened endemic Ascension frigatebird *Fregata aquila*, which breeds only on Boatswain island. Ascension and its associated stacks is regarded as the single most important seabird breeding locality in the South Atlantic. Green turtle *Chelonia mydas* and hawksbill *Eromochelys imbricata* breed on Ascension with up to 200 females nesting each year (Groombridge, pers. comm., 1991).

Surveys of the status of native vegetation have been undertaken and there is currently a project underway to safeguard bird colonies by attempting pest eradication and education programmes (Wilson, pers. comm., 1991).

Major problems include introduced cats, goats, rabbits, donkeys and sheep. Cats pose a particular threat to nesting seabirds.

Other Relevant Information Tourism is restricted due to the isolation of all the islands. Visitors to the island include passengers from RMS St Helena, but numbers are not specified. In addition, several cruise ships each year bring a few hundred visitors and between 100 and 150 yachts call at St Helena annually. There is no official provision made for visitors with consequently modest and limited accommodation (c.40 beds) (1991).

Addresses

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SCOTLAND, St Helena (Tel: (290) 4724; FAX:
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St Helena Heritage Society, Broadway House,
JAMESTOWN, St Helena

Ascension

Administrator, Ascension Islands, c/o Government of St
Helena, SCOTLAND, St Helena

Ascension Historical Society, Fort Hayes Museum,
GEORGETOWN, Ascension

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Forestry Ordinance No 9, amended No. 2 of 1985 entitled the Forestry (Amendment) Ordinance, 1985. Statutory rules and orders No. 15, amended in No. 15 of 1978 and Legal Notice No. 3, 1981

Date: Forestry Ordinance 25 October 1954, amended 1973 and 16 July 1985; Statutory rules 29 September 1959, amended 24 May 1978 and 13 January 1981

Brief description: The basis of the main protected area legislation is the Forestry Ordinance, No. 9 of 1954 which empowered the Forestry Advisory Committee and subsequently its successor the Agricultural and Natural Resources Committee to declare three categories of protected area. Under the 1985 amendment in 15A.(3) a report by the agricultural and forestry officer on the environmental consequences of the loss of such forest ... must be made in the event of attempts to revoke or alter land in one of the three categories of protected area.

Administrative authority: Agricultural and Natural Resources Committee

Designations:

National forest Defined as any designated area of crown land. Under Section 17(1) except with the written permission of the forestry officer, no person shall in any national forest: i) cut, dig, burn or carry away any soil; ii) cut, gather, burn or carry away any forest produce; iii) permit any stock to enter or remain therein; iv) bring or make any fire therein;

Dedicated forest Any area of privately owned land under the control of the forestry officer. Under Section 17(1) i-iv above also apply.

Protected private forest Under Section 17(1) i-iv above also apply

Source: Original legislation

ZAIRE

Area 2,345,100 sq. km

Population 36.6 million (1989)
Natural increase: 3.3% per annum

Economic Indicators
GDP: US\$ 61 (1987)
GNP: US\$ 170 (1988)

Policy and Legislation Formerly a Belgian colony, Zaïre (then called the Belgian Congo) achieved independence in 1960, the name being changed later in 1970. Prior to independence, each protected area was established by a Royal Decree of the Belgian monarch, under a general decree passed in 1937.

Legislation concerning protected areas is ambiguous, often leading to confusion (IZCN, 1991). Current pieces of legislation providing for protected areas are Title 1 of Ordinance Law (Ordonnance Loi) No. 69-041 of 22 August 1969 concerning nature conservation (relative à la conservation de la nature) (see Annex), which provides for strict nature reserves and national parks; the Hunting Law (82-002) of 1982 (see Annex); Law No. 024 of 1975, which provides the "secteurs sauvegardés" (although these have never been established), and the out-of-date Forest Law of 11 April 1949 (see Annex).

In April 1937 legislation on hunting was promulgated, which is still currently in force, and numerous hunting reserves (domaines de chasse) were created throughout the country (Pierret, n.d.). The Forest Law of 1949 is a typical example of the first generation of forestry laws adopted in several parts of West and Central Africa. Its structure and provisions follow the general format of other texts of the period. The forestry decree presents in its first article a definition of forests and of the forest regime. Amongst other things, it regulates the constitution of reserved and protected forest, the practice of forest usage rights, both for subsistence and commercial use, the granting of logging permits and the payment of reforestation fees. A somewhat exceptional and fairly modern provision for a legislative text of that period is presented in Article 15. This stipulates that forest inventories are to be prepared with the objective of determining the annual allowable cut for timber harvesting in a particular forest. If certain management information is not available, a provisional allowable cut may be fixed (Schmithüsen, 1986). In effect, a "Guide to forest exploitation" (Guide de l'exploitant forestier) (latest edition 1986), comprising a compendium of orders, decisions and circulars published between 1947 and 1955, provides the basis for forest regulations, although this citation is provisional (IUCN, n.d.; Schmithüsen, 1986).

According to DECNT (1990), a new forest law was finalised in 1989, and its adoption is imminent. This

would make several changes to the 1949 Forest Decree, including the following points: introduction of a new classification of forests; involving local people in forest management; reforestation to be considered a civic duty of all citizens; and forest policy to be supported by forest research.

Forest policy was defined in 1984 and states, amongst other things, that exploited forests should be preserved and reconstituted, and that future development should be concentrated within the "cuvette centrale" (DECNT, 1990; Kasali, n.d.).

According to a clause in the Land Law (loi foncier) of 20 July 1973 (modified by Law No. 80.008 of 18 July 1980), the ground and natural forests are state property (DECNT, 1990; Kasali, n.d.). Under this law, land is divided into the classified domain or forest (forêt ou domaine classée), comprising forest reserves (reserves forestiers), reforestation area (périmètres de reboisement) and developed forest (forêt aménagée), or into protected forests (forêts protégées), in which rights of use are granted.

Several pieces of legislation provide for the administration of protected areas. Ordinance Law No. 75-231 of 1975 (completing Ordinance Law No. 69-146 of 1969) established the Department of the Environment, Nature Conservation and Tourism (Département de l'environnement, conservation de la nature et du tourisme).

Ordonnance Law No. 69-041 of 22 August 1969 relating to the conservation of nature, as well as confirming the existing protected areas, also established the Institut National pour la Conservation de la Nature (INCN). This piece of legislation was modified by Decree No. 244 of 21 February 1972, Decree No. 023 of 22 July 1975 and Ordinance No. 78-190 which establish the institute under its current title of Institut Zaïrois pour la Conservation de la Nature (IZCN) (IZCN, 1991).

National parks are established under Presidential Order on the recommendation of IZCN, with their creation as "réserves naturelles intégrales" confirmed by individual ordinance laws.

The forest legislation of Zaïre is reviewed in IUCN (n.d.) and Schmithüsen (1986) and in Kasali (n.d.).

International Activities Zaïre ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) on 23 September 1974, under which four national parks have been inscribed. Three sites have been accepted as biosphere reserves under the Unesco Man and the Biosphere (MAB) programme. Zaïre has ratified the 1968 (Algiers) African Convention of Nature and Natural Resources, which provides definitions of strict

nature reserves, national parks and special reserves, but is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).

Administration and Management Prior to 1960, administration of sport hunting was left to the initiative of the hunters themselves. Within hunting reserves, however, hunting was subject to surveillance and hunters were obligatorily accompanied by a hunting guard. With the succession of the new regime in 1965, and more particularly since 1969, special attention has been given to nature conservation. From 1962, parks were the responsibility of the Ministry of Agriculture. They briefly became the responsibility of the Department of Tourism, following which they reverted to the Ministry of Land, Environment and Nature Conservation (Ministère d'Affaires foncières, de l'Environnement et de la Conservation de la Nature) (DECNT, 1990; Verschuren, 1990).

The IZCN is the principal management and protection body currently responsible for national parks and game reserves. It is under the financial aegis of the Minister of Portfolio (Ministère du Portefeuille), and under the Ministry of the Environment and Nature Conservation (Ministère de l'Environnement et Conservation de la Nature) where technical aspects are concerned. The IZCN is a para-statal, public institution with its own law enforcement personnel and independent financial standing, and thus enjoys a degree of autonomy that is unusual for African conservation organisations.

The administrative board consists of the General Director and nine other members named by the President. Employees totalled 1,898 in April 1991, of which 65% were guards (989 within national parks and 245 in reserves). The 989 national park guards are responsible for the protection of 86,600 sq. km of territory; the 245 remaining guards are responsible for 105,290 sq. km within hunting domains and reserves. However, the guards are unevenly distributed, and whereas there is one guard for around 1,900ha in Virunga National Park; in Salonga National Park this is reduced to one guard for around 27,000ha (IZCN, 1991). In most national parks and hunting reserves, the arms available are inappropriate to the conditions, and ammunition is unavailable.

More than 30 wardens have been trained at the Wildlife Institute in Garoua, Cameroon, and there are more than 20 university-trained researchers. Priorities for the institute for 1986-1990 included: production of a management plan for each national park; preparation of survival plans for endangered species, and creation of new national parks. The institute is also responsible for the promotion of scientific research and tourism and the management of centres for captive animals, both in and outside reserves. Overall control of the management of the Institute is the responsibility of the State Commission of the Environment, Nature Conservation and Tourism. The institute is managed by a Ministerial Delegate and

an Assistant Commissioner, to be nominated by the President of the Republic. Personnel within the institute comprise administrative and technical and scientific staff, including reserve commissioners, researchers and guards. Commissioners of natural reserves are officers of the judiciary police, their powers being limited to infractions against the law which provides for the establishment of the IZCN.

Due to the inadequate 40-year old Forest Law, provision for effective forest administration is absent (Kasali, n.d.). In practice, forest management is the responsibility of the Department of the Environment, Nature Conservation and Tourism (Département de l'Environnement, Conservation de la Nature et Tourisme) (Kasali, n.d.). Administration is divided between ten departments, including the IZCN, headed by the Secretary General for the Environment and Nature Conservation. Other departments pertinent to protected areas include: the Department for the Management of Renewable Natural Resources (Direction de la Gestion des Ressources Naturelles Renouvelables), which has three divisions, forest, hunting and fishing; National Reforestation Department (Service National de Reboisement), responsible for developing national reforestation policy; the Service permanent d'Inventaire et d'Aménagement Forestier, responsible for maintaining forest inventories and preparing management plans for the rational management and exploitation of forests; the Inspection Department (Service de l'Inspection), responsible for regulating litigation concerning forest protection and the MAB/Zaire programme, and for the management of the three biosphere reserves within the country. On a regional level, the department is represented by regional coordination of the environment and nature conservation, which includes an office responsible for forest, hunting, fishing and reforestation activities. At the local level there are sub-regions and zones. Within each sub-region, each department is represented by a section responsible for forests, hunting and fishing. Similarly, in each zone there is a section responsible for the environment and nature conservation. The administration is funded from three sources: the state budget, a fund for the reconstitution of the forest capital (Fonds de Reconstitution du Capital Forestier) and from investments. The Department for the Management of Renewable Natural Resources is responsible for collecting data on renewable natural resources, as well as for forest production.

The Zaire Institute of Zoological and Botanical Gardens (Institut des Jardins Zoologiques et Botaniques du Zaïre) is responsible for the administration of botanical and zoological gardens and the Centre for Natural Science Research (Centre de Recherche en Sciences Naturelles) manages three small protected areas for scientific research (IUCN, 1990). The biosphere reserves are theoretically managed by the Comité National MAB-Zaire (Programme MAB de l'Unesco).

Since 1985, the structure for forestry education has not altered much. In 1987, training for technicians in forestry and connected matters was established in two technical agricultural institutes. Civil engineers are trained at the Higher Institute for Agricultural Studies at Bengamisa, whilst at university level training is available for biologists and specialists in faunal management at the University of Kisangani. However, possibilities for training do not adequately reflect the need for trained personnel within the forest sector. In 1983 a five-step programme to develop a national conservation strategy was formulated in conjunction with IUCN/WWF and is being considered by the government and also the German Technical Cooperation Agency (von Richter *et al.*, 1990). Within the framework of technical cooperation between the Republic of Zaïre and the Federal Republic of Germany, a programme on wildlife conservation and its integration into overall rural development commenced in 1985 in Kahuzi-Biega National Park and the surrounding areas (IZCN/GTZ, 1986a, 1986b).

For several years, the international community has provided support for conservation matters, which amounted to around US\$ 4.5 million in 1991. The European Community, through its development programme, has started a large project to assist the development and management of Virunga National Park. WWF is involved with eight projects in the country, Zaïre being one of WWF's priority countries for conservation. In Garamba National Park it is part of a joint team of IUCN/WWF/FZS (Frankfurt Zoological Society) to implement a broad rehabilitation programme (Project 1954), as well as a further project focusing on safeguarding the small population of northern white rhino (Project 195401). An open-ended educational programme has been underway in Virunga National Park since 1980 (Project 1941), and in the presently unprotected Itombwe and Ituri forests research and monitoring programmes have been established with a view to developing the forests as protected areas (Projects 3902 and 3249). A further project (3836) provides support to the IZCN (WWF, 1991). The New York Zoological Society also currently has a project within the Ituri forest (SOZONY) (IZCN, 1991).

Unesco has contributed towards a proposal to establish a mangrove national park, but sufficient financial resources have not yet been found to implement the project.

According to the National Forest Activity Report (Kasali, n.d.), of the five categories of protected area (national park, faunal and hunting reserve, biosphere reserve, forest reserve and secteur sauvegardé), national parks are best protected, these having the status of strict reserve. However, protected areas suffer throughout from encroachment by local villagers, due to their lack of alternative economic means and the low level to which they are involved in reserve management (Kasali, n.d.).

According to IUCN (1990), poaching is particularly severe within two of the seven parks (Salonga and Maïko). Two of the biosphere reserves (Luki and Lufira) are in a critical state and the third (Yangambi) virtually no better (IUCN, 1990). De Richter *et al.* (1990) state that protection and management of national parks varies from a reasonably high level in Kahuzi-Biega and Virunga to minimal in Salonga and Maïko. According to Kalpers (1990), recent enforcement of patrolling and surveillance has permitted the first stage in restoration of numbers of elephants, buffaloes and especially white rhinos.

Efforts to inform and educate local populations on the importance of protected areas, in an attempt to reduce poaching and agricultural encroachment, have met with some success (Aveling, 1986). Recent methods to control poaching include: payment of an incentive allowance for information leading to the arrest of poachers caught redhanded; payment of a monthly bonus to all guards for controlling poaching; acquisition of an aeroplane to survey parks; equipping guards with modern arms and reinforcing the hunting regulations (IZCN/GTZ, 1990). In a review of the national parks of Zaïre and Rwanda, Verschuren (1990) states that management of the reserves is good.

Garamba National Park has been listed by the IUCN Commission on National Parks and Protected Areas (CNPPA) since 1984 as being under threat, due to poaching of rhinos leading to extinction. However, the park was removed from the list in 1991, as the population although still vulnerable, had increased.

Systems Reviews The Republic of Zaïre, one of the largest countries in Africa, extends from a narrow (40km) Atlantic seaboard in the west to the lake system of the western branch of the Rift Valley in the east. The country includes most of the Zaïre basin, which is the drainage area for the Zaïre-Lualaba River system. This basin, the "cuvette centrale", lies at an altitude of 300-1,000m. Broad plateaux, 500-1000m in altitude, surround the basin. High mountains are restricted to the Rift Valley region, with the highest point (5,120m) at the peak of the Ruwenzori on the Uganda border around which an area of 35,000ha lies above 3,000m. The eastern border is mountainous, all the way from Zambia to Uganda. Along the entire mountain chain, a total of more than 4,275,000ha lies above 1,500m. The southern and northern borders of Zaïre are situated on elevated plateaux which slope gently towards the interior, but with numerous scarps. The southern plateau reaches heights of 1,500m on the Zambian border, but mostly lies between 500m and 1,100m, while the northern plateau is 500-700m. More than 90% of the country drains into the Zaïre River, its basin forming the dominant physical feature of the area. The basin covers about one-third of the country. The central basin is broad and flat, constituting a slight depression in the African continental platform. It is the most clearly distinguished of the various geographic depressions situated between the Sahara to the north, the Atlantic Ocean to the south

and west, and the eastern highlands. The Lake Mobutu (Albert)-Semliki River-Lake Edward area in the trough of the Great Rift Valley in the east incorporates a small part of the drainage area of the Nile (Anon., 1980; Hughes and Hughes, 1991; von Richter *et al.*, 1990).

Tropical rain forests cover 1.25 million sq. km (52% of the country), which constitutes almost half (47%) of the tropical rain forests of Africa (Mankoto ma Mabaeele, 1987). The central and western parts of the country are covered in lowland rain forest and secondary grassland. In the south and south-east relatively wet miombo woodland, dominated by *Brachystegia*, *Julbernardia* and *Isoberlinia*, fringed to the north with grassland. Large areas of swamp forest occur in the north-west. In the east, a mosaic of montane forest and secondary grassland is interspersed with smaller areas of submontane and transitional rain forest (IUCN, 1983). A small area of mangrove forest occurs along the estuary of the Zaïre River (G. Mogueudet, pers. comm., 1991).

Subsistence farming of cassava, banana, peanuts and rice occurs in the central and northern regions. Coffee is the main agricultural export crop, other export crops being cocoa, rubber, sugar cane, palm oil and tea (IUCN, 1990).

In general, the major ecosystems remain relatively intact. The natural habitats of much of the equatorial forest zone and parts of the peripheral savannas are under little pressure from development due to very low population densities. Forest exploitation remains moderate, compared to the potential which could be achieved. However, increased exploitation is expected in the near future (IUCN, 1990). In eastern Zaïre, for example, large areas of primary moist forest remain intact. Nevertheless, some exploitation has occurred in more highly populated and more accessible areas. In the eastern part of the country transitional forests have been largely cleared for agricultural use. The relatively accessible forests near the coast have been subjected to heavy logging, whilst more recently exploitation has continued into the central basin, where rice cultivation is now also affecting some of the swamp forests. Further inland, exploitation has been limited to removal of trees of the few most profitable species, due to problems of access and expense (Kasali, n.d.; von Richter *et al.*, 1990).

As early as 1889, elephants were being massacred, leading to the establishment of elephant reserves in order to prevent their extinction. Similarly, in 1912 hunting of mountain gorillas was prohibited, as they were under threat from collection for zoos and museums, as well as a source of food, ornamentation and medicine. Following a visit in 1919 to Yellowstone National Park in the USA, King Albert of Belgium created a park named after him in Zaïre (then a Belgian colony) in 1925. Its name was later changed to the present title of Virungas National Park (Nzana-Ndoni, 1986). Two further parks, Garamba and Upemba, were created soon after this in 1938 and 1939, respectively. Between 1939

and 1970 no further national parks were created, leaving many ecosystems unprotected. Numerous hunting areas were created throughout the country to ensure production of game meat for the rural population in addition to providing sport hunting. With the succession of the new regime in 1965, and more specifically since 1969, special attention has been given to problems of nature conservation.

In 1960, at the time of independence, some politicians attempted to attract popularity by claiming it was necessary to get rid of national parks, as these represented the last vestiges of the colonial epoch. Encouraged by this attitude, and by the profit to be made in selling skins and trophies to adjacent countries, some villagers turned to poaching. With the succession of the new regime, the Institute of National Parks (Institut des Parcs Nationaux) was attached to the President of the Republic, a sign that the fauna of the country was to be treated seriously. Following this, a department encompassing the environment, nature conservation and tourism was created, under the administration of which was the IZCN (Nzana-Ndoni, 1986). Poaching, however, continued to pose a serious threat. Not only had means of surveillance dwindled, but, taking the sport hunting zones into account, the areas to protect had also increased. Previously these had been managed by the agriculture or environment departments, but had in practice been assigned to the IZCN (Nzana-Ndoni, 1986).

In 1970 the authorities decided to create four new national parks, Salonga, Maïko, Kahuzi-Biega and Kundelungu. The original national parks were created in order to preserve certain species: Virunga and Kahuzi-Biega for gorilla; Garamba for rhinoceros and giraffe; Upemba for zebra, eland and black antelope; Kundelungu for leopard and kudu; Maïko for okapi and peacock and Salonga for dwarf chimpanzee. These last two parks equally protected representative sections of the forest block, as in this biome shifting agriculture, uncontrolled fires and some forest exploitation constituted a threat (Nzana-Ndoni, 1986). With the creation of reserves, efforts were made to compensate local populations by their relocation to more suitable areas, free from sleeping sickness, and by creating fishing cooperatives to compensate for the loss of game hunting in protected areas. Some very small protected areas also exist in the country: three zoological and two botanical gardens, and three protected areas for scientific research at Bikoro, Irangi and Uvira (IUCN, 1990).

Parks, reserves and hunting areas represent more than 7% of the national territory, and are well distributed through the country (Kasali, n.d.). Recently, the authorities have decided to create more nature reserves, and the Head of State has announced that 12-15% of the country will be designated as reserves before the end of the century (Kasali, n.d.).

The development of national parks and sport hunting zones, both designed to encourage tourism, is reviewed

by Pierret (n.d.). The problems that such reserves can cause by depriving rural populations of their ancestral land rights, and the fact that they are forced to move to territory which is frequently inferior, are highlighted. Local populations receive little benefit from the reserves, these being almost entirely patronised and organised by non-Zairians. A review of the status of national parks with regard to antelopes is given in von Richter *et al.* (1990). A review of Virunga National Park is given in Verschuren (1988), who also includes remarks concerning other national parks. Kalpers (1990) gives recommendations to improve the management of Garamba National Park. The status of the elephant population in several protected areas in Zaïre is reviewed by Alers *et al.* (1989). The protected areas system is reviewed in IUCN (1983). Proposals to improve the protected areas system are given in MacKinnon and MacKinnon (1986) and IUCN (1987, 1990).

The major threat to wildlife comes from poaching, especially of commercially valuable species which have suffered severely. For example, the elephant population of the forest zone (formerly about 300,000) has been reduced to about 60,000 with only four remaining concentrations, in Salonga, Maïko and Kahuzi-Biega national parks and the Lomami Forests. Salonga and Maïko national parks are currently largely under the control of heavily armed gangs of poachers, and parts of Maïko National Park have been occupied by Simba rebels for more than 20 years (von Richter *et al.*, 1990). Poaching gangs are decimating the elephant and hippopotamus populations of these two parks, but appear to have very little impact on other wildlife. Bushfires are unknown in most of the forests. Each year, however, open forest and gallery forest in the south are deliberately burned for hunting purposes. This threatens certain reforestation zones, particularly those planted with exotic species (DECNT, 1990; Kasali, n.d.).

Kahuzi-Biega National Park has been at risk from the development of a road between Kisangani and Bukavu, which since 1982 had been reconstructed with support from the EC, the African Development Bank and the government of Zaïre. This was planned to pass through the park, however, conclusions of an impact study favour diverting the road to the north, rather than permitting it to traverse the park. German cooperation in constructing the final section has been withdrawn as long as the threat to the integrity of the park from the increased traffic remains (Anon., 1991).

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: Ordonnance-Loi No. 69-041 relative a la conservation de la nature (relative to nature conservation)

Date: 22 August 1969

Brief description: Provides *inter alia* for strict nature reserves and national parks

Administrative authority: Institut Zaïrois pour la Conservation de la Nature

Designations:

Réserve naturelle intégrale (Strict nature reserve)
An area in which it is forbidden to enter, traverse, camp or stay

It is forbidden to introduce dogs, traps, arms, or to transport or export living wild animals, skins or hides or non-cultivated vegetable products.

Prohibitions on entry do not apply to certain stipulated people.

It is prohibited to disturb in any manner wild animals, even harmful ones, except for cases of legitimate defence, or to remove, or to harm eggs and their nests.

If an animal is killed or harmed in the cause of legitimate defence, this must be declared within a stipulated time.

It is prohibited to: damage non-cultivated plants; introduce any species of animal or plant; undertake any form of excavation, prospecting or drilling, or remove any material or any activity modifying the land or vegetation.

It is prohibited to: block rivers, remove or pollute directly or indirectly the water; fish of any sort; fly over at an altitude lower than 300m.

Tourism is permitted in designated sections, entry and camping being under the control of an appropriate agency.

Penalties for infraction of the law are stipulated and include prison sentences of one to ten years for killing specific species.

Parc national (National park) Comprise strict nature reserves within the meaning of this law

Also governed by special texts.

Within which customary rights other than those specifically stated are not permitted.

Source: Original legislation in French

Title: Ordonnance-Loi No. 82-002 sur la chasse (hunting law)

Date: 1982

Brief description: Provides *inter alia* for faunal reserves

Administrative authority: Institut Zaïrois pour la Conservation de la Nature

Designations:

Réserve totale de faune (Total faunal reserve)
Hunting and all other human activity is prohibited, thus the same level of protection is provided as is found in national parks

Réserve partielle de faune (Partial faunal reserve)
Exploitation of wildlife is permitted subject to regulations, thus protection equals that found in hunting domains

Source: IZCN, 1991

Title: Décret du 11 Avril 1949 sur le régime forestier (the forest regime)

Date: 11 April 1949

Brief description: Provides *inter alia* for designation of land within the forest domain

Administrative authority: Service des Eaux et Forêts (Water and Forests Service)

Designations:

Forêt classée (Classified forest) Domaine classée de la colonie (classified domaine of the colony).

Includes existing state forests and those to be promulgated in the future by the Governor General.

Areas insufficiently or not wooded for which protection is declared necessary by order of the Governor General, notably for: reforestation; protection of slopes against erosion; protection of water sources; and in the interest of public health.

Only customary rights listed in the classifying ordonnance are permitted.

Domaine classée des indigènes (Classified domain of indigenous people) Forested or bushy areas where rights of occupation by indigenous people are established following certification by the territorial administration.

Forêt protégée (Protected forest) All other forests, not subject to a classification order.

Cutting of wood and collection of dead wood for domestic use freely permitted to all people.

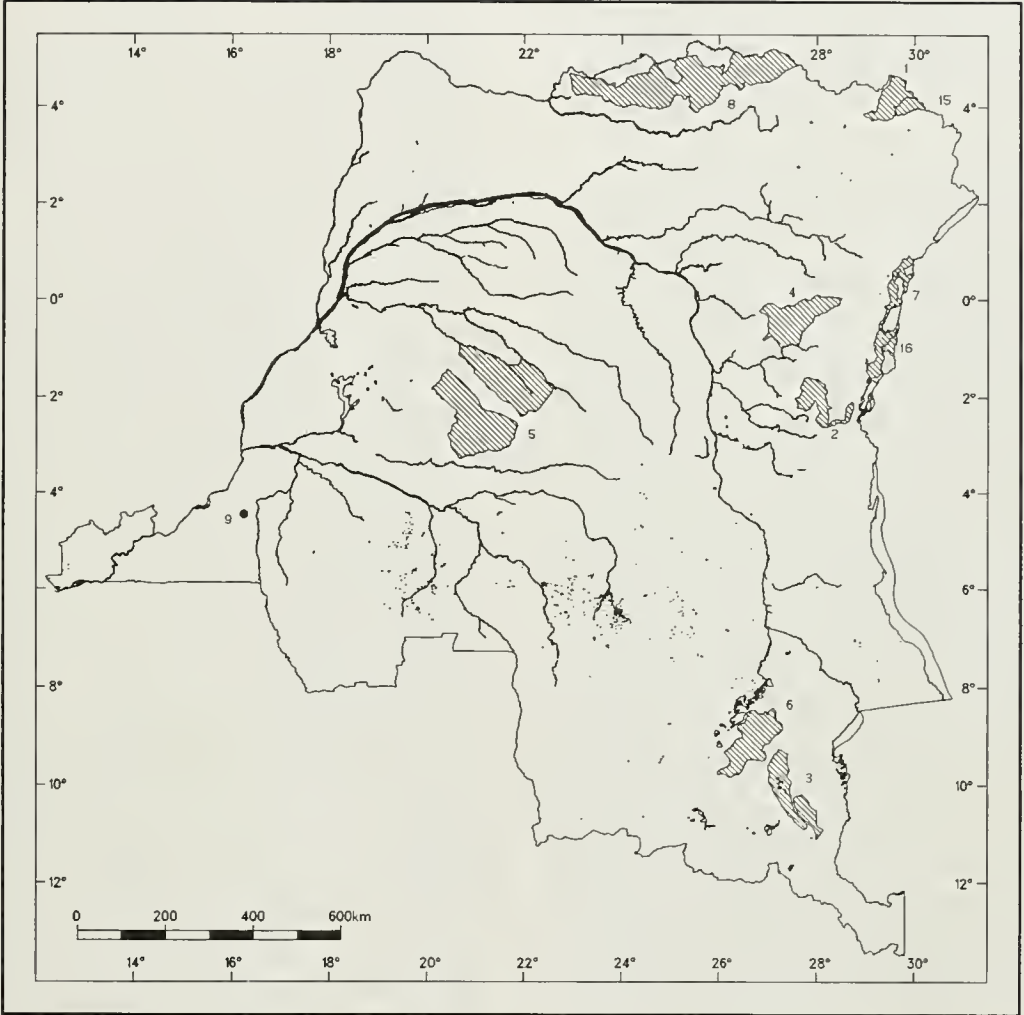
Cutting of wood by indigenous populations for carpentry is permitted.

Source: Original legislation in French

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Garamba	II	492,000	1938
2	Kahuzi-Biega	II	600,000	1975
3	Kundelungu	II	760,000	1970
4	Maiko	II	1,083,000	1970
5	Salonga	II	3,656,000	1970
6	Upemba	II	1,173,000	1939
7	Virunga	II	780,000	1925
	<i>Hunting Reserves</i>			
8	Bili-Uere	VI	600,000	
9	Bombo-Lumene	VI	250,000	
10	Bushimaie	VI	60,000	
11	Luama	VI	340,000	
12	Lubudi-samppa	VI	9,200	
13	Maika-Penge	VI	900,000	
14	Mangai	VI	36,000	
15	Mondo Missa	VI	1,000,000	
16	Rutshuru	VI	100,000	
17	Swa-Kibula	VI	140,000	
	<i>Biosphere Reserves</i>			
	Vallee de la Lufira	IX	14,700	1982
	Réserve forestière de Luki	IX	33,000	1979
	Réserve floristique de Yangambi	IX	250,000	1976
	<i>World Heritage Sites</i>			
	Garamba National Park	X	492,000	1980
	Kahuzi-Biega National Park	X	600,000	1980
	Salonga National Park	X	3,600,000	1984
	Virunga National Park	X	790,000	1979

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Zaire

ZAMBIA

Area 752,610 sq. km

Population 8,100,000 (1990)

Natural increase: 3.8% per annum

Economic Indicators

GDP: US\$ 252 per capita (1987)

GNP: US\$ 290 per capita (1988)

Policy and Legislation The declaration of game reserves and regulations applying to their management and use were first provided for by the Game Ordinance, 1925. This legislation was followed by the Fauna Conservation Ordinance and Victoria Falls Trust Ordinance, all of which were replaced by the National Parks and Wildlife Act No. 57, 1968. This Act, which was recently redrafted and is currently before parliament, gives authority to the President to declare any area as a national park with the consent of the National Assembly, abolishes the previous categories of game reserve, controlled hunting area and private game area, and provides for the creation of a new category of protected area, namely, the game management area (see Annex). Subsequently, the Game Management Area Declaration Order, 1971, the National Parks Declaration Order, 1972, and Statutory Instrument No. 44, 1972 established the current network of conservation areas under the National Parks and Wildlife Act. The National Parks Regulations of 1972 (Statutory Instrument No. 9, 1972), also made under this Act, makes provision for restrictions, and offences and penalties in connection with national parks (see Annex). Other complimentary protected areas legislation includes Gazette Notice No. 89 of 1979 (Hunting in Game Management Areas), which *inter alia* lists game management areas available to non-resident hunters; Statutory Instrument No. 180, 1982 (the National Parks and Wildlife (Bird Sanctuaries) Regulations), which establishes that entry or residence in bird sanctuaries is prohibited without an appropriate permit, and outlines restrictions and accompanying penalties associated with such areas; the Protected Places and Areas Act (Amendment Act No. 4), 1968; and the International Game Park and Wildlife Act No. 27, 1971. This latter Act allows for the establishment of the International Game Park, for the appointment of wildlife officers and wildlife rangers, and provides for the creation and mandate of an Advisory Committee (see Annex).

Government policy, first stated in the Ministry's Annual Report of 1958, and subsequent guidelines regarding the use and management of national parks and game management areas have supported protected areas legislation (Dodds and Patton, 1968). Accordingly, the national parks were established to preserve representative selections of the country's indigenous environments for the enjoyment and education of the general public, and a policy of "no major developments

inside the national parks" with the exception of roads, rest areas and other non-permanent structures has been adopted (IUCN, 1976). Game management areas which surround national parks and serve as buffer zones against disruptive land-use practices were established with the basic policy being to conserve wildlife within game management areas at optimum variety and abundance commensurate with other land uses, and to allow for a harvest to be culled annually on a sustained yield basis (IUCN, 1976; Lewis, n.d.). These areas were created with the overall objective of providing a framework within which to integrate wildlife management into the rural economy (Lungu, 1990).

Early legislation allowing for the establishment of forest reserves and protected forest areas was Chapter 105 of the Laws, 1948 edition. This legislation set out prohibited activities in such areas and the procedure involved in gazetement. By virtue of the Forest Act, 1973 (Act No. 39; Cap 311), earlier legislation was repealed and replaced. This Act provides for the establishment and management of national and local forests (see Annex). The Act also establishes that all trees and forest produce on state lands, reserves, trust lands, national forests and local forests are vested in the President on behalf of the Republic. The Chief Conservator is responsible for the control and management of local and national forests, and forest offences and penalties are spelt out in the Act. Subsidiary legislation includes the Forest Regulations (Cap 311), made under the Forest Act. These Regulations make provision for felling, protection of forests from fire, licensing, and demarcation of reserve boundaries. Today, forest reserves are established either as protected forests or as commercial forests for management purposes, and may constitute either a national or local forest. The function of protected reserves is to protect hill ranges and headwaters through prevention of soil erosion. Although most of these forests are also productive, exploitation may either be prohibited or limited so as to improve forest stand and growth. Commercial reserves are managed to produce wood on a sustained yield basis. National parks are classified as conservation forests by the Forestry Department, and are managed to maintain or improve wildlife habitat (IUCN, 1982; Carwardine, 1987).

One of the first pieces of legislation allowing for the preservation of natural and historical monuments and relics was the Natural and Historical Monuments and Relics Act of 1947, amended to 1964. This Act was repealed with the passing of the National Heritage Conservation Commission Act No. 23, 1989. This Act provides for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, prehistorical, archaeological or scientific interest; and establishes the National Heritage Conservation Commission, defining its functions and

powers. The Act also defines national monument, ancient heritage, cultural heritage, and natural heritage (see Annex).

In 1985, a national conservation strategy (NCS) was published. Issues specified by the NCS as warranting investigation are, *inter alia*, a review of the legal and institutional mechanisms for more effective wildlife conservation, the environmental effects of different types of land use in game management areas and their compatibility, and the funding and organisation of the National Parks and Wildlife Service (IUCN, 1984). It is envisaged that the NCS can provide the necessary policy guidance to be built into the next five-year plan and into its annual revisions (IUCN, 1984).

International Activities Zambia is party to a number of international conventions concerned with protected areas, namely the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) ratified on 4 June 1984, and has acceded to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention). To date, one site has been inscribed on the World Heritage list. Zambia does not participate in the Unesco Man and the Biosphere (MAB) programme. At the regional level, Zambia is party to the African Convention on the Conservation of Nature and Natural Resources (African Convention), which establishes several categories of protected area.

Administration and Management The National Conservation Committee (NCC) Secretariat is responsible for coordinating the various ministries responsible for environmental matters. The Ministry of Water, Lands and Natural Resources is the key authority for land tenure, and for the conservation and development of natural resources outside the agricultural, water and fisheries sectors. The Ministry of Tourism was established to develop and exploit tourism potential, which is largely based on wildlife and other natural resources. Within the jurisdiction of this Ministry is found the National Parks and Wildlife Service (NPWS) and the National Heritage Conservation Commission. The Natural Resources Advisory Board has advisory and supervisory functions for natural resources conservation, development and exploitation (Speece, 1982). A proposed Environment Council is to be established with the enactment of the Environmental Protection and Pollution Control Act (Jeffery, pers. comm., 1991).

Falling under the Ministry of Water, Lands and Natural Resources is the Forest Department which has responsibility, *inter alia*, for managing national and local forest reserves, along with the pine and eucalyptus plantations in most provinces (Bass *et al.*, 1984). A total of 36 professional officers is responsible for four divisions, namely, Management, Research, Beekeeping, and Forest Training and Extension Services.

Following a report by Captain C.R.S. Pitman, a memorandum was issued in 1939 for the formation of a Game Department in Northern Rhodesia (IUCN, 1976). Known as the Department of Game and Tsetse Control, this department was separated in 1959, with Tsetse Control being placed under the Ministry of Lands and Natural Resources, while Game and Fisheries was placed under the Ministry of Native Affairs (Dodds and Patton, 1968). In 1963, the Game and Fisheries Department was transferred back to the Ministry of Lands and Natural Resources (Dodds and Patton, 1968). Today, the National Parks and Wildlife Service, under the Ministry of Tourism, is responsible for protecting, conserving and managing the national parks, game management areas and bird sanctuaries in the country. This service has a field staff of over 2,000 and has jurisdiction over the Zambia Wetlands Project and the Administration Management Design (ADMADE) programme for Game Management Areas (Bass *et al.*, 1984; Jeffery, 1990a). US-AID and WWF have provided support for ADMADE, while ODA, WWF, IUCN, and Debt for Nature Funds have supported the wetlands initiative. The Luangwa Integrated Rural Development Project (LIRDP), directed by a steering committee headed by the President of Zambia and comprising members of the Central Committee and relevant cabinet ministers, is receiving support from IUCN, WWF and NORAD (Lungu, 1990). The wildlife component of LIRDP is managed by NPWS officers (Jeffery, pers. comm., 1991).

Also falling under the Ministry of Tourism is the National Heritage Conservation Commission, formerly the Commission for the Preservation of Natural and Historical Monuments and Relics (National Monuments Commission). This corporate body is responsible, *inter alia*, for the protection, preservation and management of unique natural features, fossils and relics which have national or international significance. The Commission, consisting of a Chairman and between seven and ten members, currently manages 68 national monuments around the country, the first of which, Victoria Falls was declared in 1948 (Carwardine, 1987; Phillipson and Katanekwa, 1987). All sites are owned by the state, and the Commission has a Director and 40 full-time and 40 part-time staff to carry out the organisation's mandate (Carwardine, 1987).

Local non-governmental organisations include the Wildlife Conservation Society of Zambia (WCSZ), which has been involved in wildlife census and conservation education work, and the Zambia Forestry Association, run by the Forest Department (Bass *et al.*, 1984). The National Council for Scientific Research (NCSR), which occasionally assists in wildlife research, has a national coordinating responsibility for international resource programmes, and hosted the preparation of the NCS (Bass *et al.*, 1984).

There are a number of constraints facing protected areas management. The Ministry of Water, Lands and Natural Resources, National Parks and Wildlife Service, and the

National Heritage Conservation Commission all suffer from limited financial resources, lack of equipment, transport constraints, and too few trained personnel (Bass *et al.*, 1984; Carwardine, 1987; Dalal-Clayton, n.d.; MacKinnon and MacKinnon, 1986;). An absence of national land-use plans and a lack of coordination with other agencies, such as tourism operating in and around the protected areas, have also hindered the activities of the National Parks and Wildlife Service (Bass *et al.*, 1984; NPWS, 1981; MacKinnon and MacKinnon, 1986). To manage conservation areas effectively, it has been recommended that the National Parks and Wildlife Service be strengthened and that ways be explored of sharing management responsibility with other departments and organisations.

Systems Reviews Zambia is a land-locked country, bordered by Angola to the west, Zaïre and Tanzania to the north, Malawi and Mozambique to the east, and Zimbabwe, Botswana and Namibia to the south. Situated on the Central African Plateau, 80% of the country lies above the 1,000m contour (Hughes and Hughes, 1991). The biogeographic affinities are Zambezian, with a small area of Afromontane in the extreme northeast (Stuart and Adams, 1990). The vegetation is predominantly miombo woodland (80% of the country's vegetation), with drier mopane woodland in the Luangwa and Zambezi Valleys and parts of the west, extensive wetlands and floodplains in many areas, patches of dry evergreen forest in the north-west, and montane forest and grassland in the north-east (Davis *et al.*, 1986; IUCN, 1976; Stuart and Adams, 1990). These are commonly grouped into three major types, namely, forest, woodland and grassland (IUCN, 1976).

As of the late 1970s, 55% of the country was classified as forested by the Forest Department, although the majority of this was woodland (IUCN, 1982; Speece, 1982). Today, forest/woodland is estimated to account for 39% of total area, pasture 47%, and cultivated land, 7% (Stuart and Adams, 1990). By some accounts, deforestation and rangeland degradation are considered serious. One estimate suggests that if exploitation due to slash and burn agriculture (traditional chitemene system), firewood gathering and charcoal production continues at its present rate, Zambia's woodlands could disappear within 25 years (Speece, 1982). A more recent estimate suggests that 0.5% of woodlands are lost each year through deforestation, while the estimated rate of deforestation for closed broad-leaved forest is 400 sq. km per annum of the total of 30,100 sq. km (Davis *et al.*, 1986; Carwardine, 1987; FAO/UNEP, 1981). Mining remains the major component of the economy, with copper production earning more than 90% of foreign exchange (IUCN, 1984).

The two main drainage systems are the Zambezi River (with the Kafue and Luangwa rivers as major tributaries) which drains into the Indian Ocean, and the Chambeshi watershed. Several large lakes, notably Mweru, Bangweulu, parts of Lake Tanganyika in the north and the man-made lake, Kariba, are also found (Cawardine,

1987; Dunlap, 1973; IUCN, 1982). Other wetland areas comprise 'dambos', which are clay-based, low-lying areas which are more or less permanently waterlogged and found throughout the highlands, swamp forest, seasonally inundated woodland, reed swamps, papyrus swamps, and flood plains. All wetlands constitute 6% of total land area (Hughes and Hughes, 1991; Jeffery, 1990b). Although areas of the flood plains of the Kafue, Zambezi and Bangweulu are all afforded some protection in national parks or game management areas, wetland conservation and development has been identified as a top priority in the NCS (IUCN, 1984; MacKinnon and Mackinnon, 1986). In support of the NCS, recommendations have included: an assessment of the swamps south of Lake Mweru along the Luapula River and the Lukanga Swamp for conservation action; and extension of protection to cover parts of the flood plains of the Zambezi river, all of the Bangweulu swamps and part of Lake Bangweulu itself (MacKinnon and MacKinnon, 1986; Stuart and Adams, 1990). In connection with these recommendations, the WWF/Zambia Wetlands Project, a pilot project for the SADCC (Southern African Development Coordination Conference) regional wetlands programme, was initiated within the NPWS in 1985. This project seeks to conserve and manage the natural resources in the Kafue Flats and Bangweulu Swamps, while improving the quality of life for local communities through sustainable utilisation of natural resources (Somers, 1990). To date, important lake habitats receive no formal protection (Stuart and Adams, 1990).

Wildlife conservation dates from before 1895 when it was reported that chiefs had traditional hunting grounds. Under British colonial administration, the Game Ordinance of 1925 and amendments of 1931 provided for the establishment of six game reserves (Dodds and Patton, 1968). A report by Pitman in 1934 recommended that existing game reserves be extended and new ones established, that a greater part of the Luangwa Valley be set aside as a game sanctuary in perpetuity, and that consideration be given to the creation of a national park in the then Kafue Game Reserve (IUCN, 1976). As a result of these recommendations and following the 1939 memorandum, a further eight game reserves were established between 1941-1942 and four controlled hunting areas were declared, which were to serve as buffer zones between game reserves and settled areas (IUCN, 1976). Only one national park, Kafue National Park, was declared in 1950, under the Game Ordinance of 1925 (IUCN, 1976). By virtue of legislation passed in the early 1970s, vast areas were added to the national park system to upgrade the status of the protected or restricted areas, and game management areas were constituted (IUCN, 1982). Today, national parks cover 6,359,000ha or 8.4% of total area, while game management areas constitute another 16,048,800ha or 21.3% of total area (WCMC, 1991). In a number of protected areas, management plans are currently being developed (Dalal-Clayton, n.d.).

The forest estate comprises approximately 5.9 million ha in protected forest reserves and about 1.4 million ha in commercial reserves, which together cover around 9.7% of the total area of the country (WCMC, 1991; Chakanga, pers. comm., 1991). The government has set a target to increase the total area of these state-managed forests to at least 15% in the future (Carwardine, 1987).

Certain priorities to develop the protected areas network are identified in MacKinnon and MacKinnon (1986), IUCN (1987) and Stuart and Adams (1990). Zambia has a good protected areas network covering most major habitat types, with several grassland and woodland habitats, floodplains, and important grazing areas for game being well-covered (MacKinnon and MacKinnon, 1986). There are, however, a few biotic communities that are threatened or inadequately protected. For example, it has been recommended that reserves be established to protect the montane habitats of the Msuku and Mfika Hills (MacKinnon and MacKinnon, 1986). Isolated patches of lowland and gallery forest in the north-west also lack protection (Stuart and Adams, 1990). Improved protection and management in all existing protected areas, and the preparation and implementation of national land use and management plans for protected areas are other priorities (MacKinnon and MacKinnon, 1986).

Currently, two major parallel initiatives testing different models for involving local communities in sustainable use of wildlife resources are the Administration Management Design (ADMADE) programme for game management areas (GMAs) and the Luangwa Integrated Rural Development Project (LIRD) (Lungu, 1990). Both initiatives grew out of the Lupande Research and Development Projects. ADMADE is a programme providing a national policy framework for community-based wildlife conservation and management, linking wildlife benefits to local communities for conservation in GMAs. Wildlife management authorities (WMAs), which guarantee local participation in wildlife conservation, have been established at the community level under this programme (Jeffery, 1990b; Somers, 1990). To date, the concept of ADMADE, which originated in Lupande Game Management Area, has been successful in bringing income to local residents and in reducing elephant and rhino poaching (Lewis, n.d.). LIRD was formally initiated in May 1986 covering the central part of the Luangwa Valley, comprising South Luangwa National Park and Lupande Game Management Area, while extension to other game management areas is under examination. Development of a land-use plan and gradual control of resources by local communities are two goals of LIRD (Lungu, 1990). While ADMADE is strictly a wildlife sector programme operating in numerous GMAs, LIRD is intended to be a multi-sectoral project for economic development in the central part of the Luangwa Valley and includes wildlife management and initiatives aimed at development of

agriculture, forestry, fisheries, water resources and infrastructure (Lungu, 1990).

Poaching is considered to be the severest threat to the integrity of the protected areas system (Stuart and Adams, 1990). Other threats include: uncontrolled bushfires (Stuart and Adams, 1990); illegal and uncontrolled human settlements in a number of protected areas; agricultural encroachment and illegal grazing of domestic livestock (MacKinnon and MacKinnon, 1986); expansion of industrial activities; mineral prospecting; local overpopulation of some wildlife species, particularly elephants, leading to destruction of habitat; hydroelectric developments, affecting some protected areas (Mulongo, 1981; Speece, 1982); and illegal fishing and fishing camps (NPWS, 1978, 1983).

Addresses

- Ministry of Water, Lands and Natural Resources (Conservator), PO Box 30055, LUSAKA (Tel: 214988)
- Forest Department (Chief Conservator), PO Box 70228, NDOLA (Tel: 610289/90/91; Tlx: 30153 FOREST ZA; Telegrams: CONFORESTS)
- Ministry of Tourism (Permanent Secretary), PO Box 50573, LUSAKA (Tel: 211110)
- National Heritage Conservation Commission (Director), Chishimba Falls Road, PO Box 60124, LIVINGSTONE (Tel: 320481)
- National Parks and Wildlife Service (Director), Private Bag 1, CHILANGA (Tel: (278366) 278187/278517/278683/278028; Telegrams: DIROGAM, CHILANGA)
- National Council for Scientific Research (NCSR), PO Box CH 158, LUSAKA (Tel: 281081/6)
- Wildlife Conservation Society of Zambia (WCSZ) (Executive Director), PO Box 30255, LUSAKA (Tel: 254226)
- Zambia Forestry Association, PO Box 70228, NDOLA (Tel: 2251, Ndola)

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ANNEX

Definitions of protected area designations, as legislated, together with authorities responsible for their administration

Title: The National Parks and Wildlife Act (Act No. 57)

Date: 1968, last amended 1970

Brief description: Provides for the creation of national parks and game management areas

Administrative authority: National Parks and Wildlife Service (Director)

Designations:

National park

Game management area Areas where hunting is controlled by permit.

Source: Dunlap, 1973

photography and sound recording, apply in such areas.

Sources: Original legislation; Dunlap, 1973

Title: International Game Park and Wildlife Act (Act No. 27)

Date: 6 August, 1971, commenced by virtue of Statutory Instrument No. 190 of 1973

Brief description: An act to provide for the establishment of the International Game Park.

Administrative authority: National Parks and Wildlife Service (Director)

Designations:

International game park Provisions of the National Parks and Wildlife Act, 1968, apply.

Title: The National Parks Regulations (Statutory Instrument No. 9)

Date: 12 January 1972

Brief description: Regulations stated which pertain to national parks.

Administrative authority: National Parks and Wildlife Service (Director)

Designations:

National park Permitted activities in such areas include: the establishment of wilderness trail safari camps; small-scale fishing facilities and boating facilities; beaches; nature trails; observation facilities; picnic sites; interpretive exhibits; exploration and interpretation of archaeological and historic features in some circumstances; and, habitat modification (vegetation clearing) for management purposes.

Prohibited activities include driving predators away from kill; feeding of wild animals; disturbance of animals and persons from sound-producing apparatus; any modification of park habitat, except that required for park management; establishment of visitor accommodation facilities or buildings of any kind; airfields; water supply developments; waste disposal facilities; swimming developments; noxious insect control measures; and, wildlife viewing and photographic stands, blinds and towers.

Restrictions on entry and exit; movement within; the use of motor vehicles or low-flying aircraft; building; destruction of vegetation; lighting of fires; removal of trophies; trading; fishing; and commercial

Title : The Forest Act (Act No. 39) and Regulations

Date: 1973

Brief description: Provides for the establishment and management of national and local forests

Administrative authority: Forest Department (Chief Conservator)

Designations:

Forest The president may declare any area of land to be a national forest or local forest, subject to consultation with the local authority. The President may also declare that the whole or part thereof of such areas shall cease to be such and may alter or extend the boundaries of a national or local forest.

National forest Such areas are exclusively used for the conservation and development of forests with a view to secure supplies of timber and other forest products, provide protection against floods, erosion and desiccation, and maintain the flow of rivers.

Prohibited activities, excepting those authorised by license include: collection or removal of timber and any forest produce; squatting; camping; erection or operation of any equipment; lighting of fires; smoking in prohibited areas; clearing; entry, with the exception of a traveller on a public road; and removal or damage of any boundary marks, notices, fences or gates.

Local forest Such areas are to be used exclusively for the conservation and development of forests, so

as to supply timber and afford protection to land and water supplies.

The same restrictions apply to local forests as to national forests.

Prohibited activities, excepting those permitted under licence include: cutting; removal of, or dealing in, protected trees or other timber or forest produce; and the sale or manufacture of charcoal.

Source: Original legislation

Title : The National Heritage Conservation Commission Act (No. 23)

Date: 1989

Brief description: Provides for the establishment of national monuments and the National Heritage Conservation Commission

Administrative authority: National Heritage Conservation Commission (Director)

Designations:

National Monument Upon the recommendation of the Commission, the Minister may, by statutory notice, declare or provisionally declare the heritage or relic to be a national monument.

The Minister, upon recommendation from the Commission, may by statutory instrument, make regulations pertaining to national monuments. These regulations may cover access, fees, and general regulations and restrictions in such areas.

Natural heritage May include any area of land which has distinctive beautiful scenery or has a distinct geological formation; any area of land containing rare distinctive or beautiful flora or fauna; any waterfall, cave, grotto, old tree or avenue of trees; any other natural object with aesthetic, or scientific value or interest; and any natural relic.

Source: Original legislation

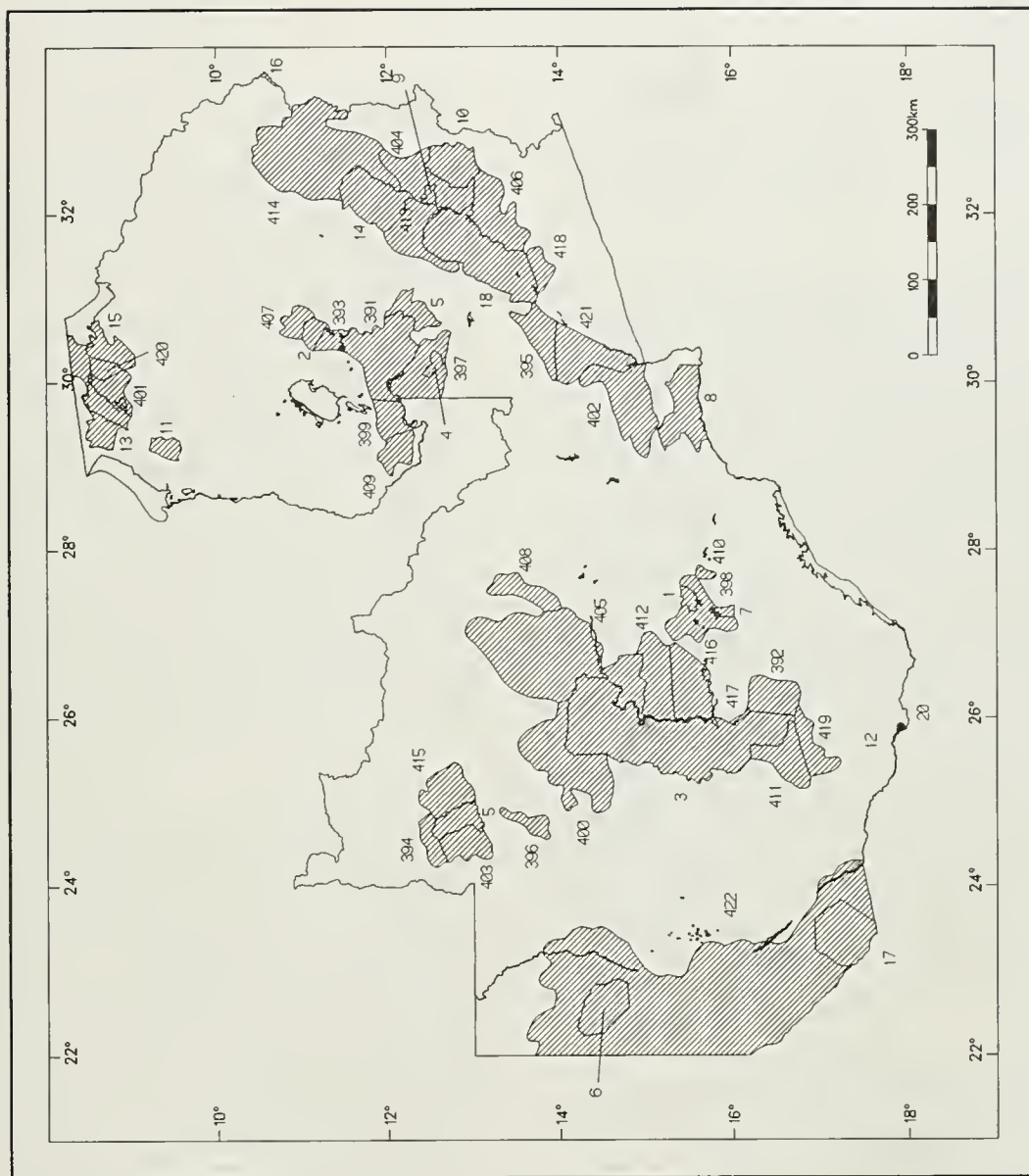
SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
	<i>National Parks</i>			
1	Blue Lagoon	II	45,000	1973
2	Isangano	II	84,000	1972
3	Kafue	II	2,240,000	1951
4	Kasanka	II	39,000	1972
5	Lavushi Manda	II	150,000	1972
6	Liuwa Plain	II	366,000	1972
7	Lochinvar	II	41,000	1972
8	Lower Zambezi	II	414,000	1983
9	Luambe	II	25,400	1972
10	Lukusuzi	II	272,000	1972
11	Lusenga Plain	II	88,000	1972
12	Mosi-Oa-Tunya	II	6,600	1972
13	Mweru-Wantipa	II	313,400	1972
14	North Luangwa	II	463,600	1972
15	Nsumbu	II	202,000	1972
16	Nyika (Zambia)	II	8,000	1972
17	Sioma Ngwezi	II	527,600	1972
18	South Luangwa	II	905,000	1972
19	West Lunga	II	168,400	1972
	<i>Natural Monument</i>			
20	Victoria Falls	III	1,900	1948
	<i>Game Management Areas</i>			
391	Bangweulu	VI	657,000	1971
392	Bilili Springs	VI	308,000	1971
393	Chambeshi	VI	62,000	1971

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
394	Chibwika-Ntambu	VI	155,000	1971
395	Chisomo	VI	339,000	1971
396	Chizera	VI	228,000	1971
397	Kafinda	VI	386,000	1971
398	Kafue Flats	VI	517,500	1971
399	Kalaso Mukoso	VI	67,500	1971
400	Kansonso-Busanga	VI	778,000	1971
401	Kaputa	VI	360,000	1971
402	Luano	VI	893,000	1971
403	Lukwakwa	VI	254,000	1971
404	Lumimba	VI	450,000	1971
405	Lunga-Luswishi	VI	1,334,000	1971
406	Lupande	VI	484,000	1971
407	Luwingu	VI	109,000	1971
408	Machiya-Fungulwe	VI	153,000	1971
409	Mansa	VI	207,000	1971
410	Mazabuka	VI	25,400	1971
411	Mulobezi	VI	342,000	1971
412	Mumbwa	VI	337,000	1971
413	Munyamadzi	VI	330,000	1971
414	Musalangu	VI	1,735,000	1971
415	Muscle-Matebo	VI	370,000	1971
416	Namwala	VI	360,000	1971
417	Nkala	VI	19,400	1971
418	Sandwe	VI	153,000	1971
419	Sichifula	VI	360,000	1971
420	Tondwa	VI	54,000	1971
421	West Petauke	VI	414,000	1971
422	West Zambezi	VI	3,807,000	1971
<hr/>				
	<i>Ramsar Wetlands</i>			
	Kafue Flats	R	83,000	1991
	Bangweulu Swamps	R	250,000	1991
	<i>World Heritage Site</i>			
	Victoria Falls/Mosi-oa-Tunya	X	3,779	1989

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of most protected areas are shown on the accompanying map.



Protected Areas of Zambia

ZIMBABWE

Area 390,580 sq. km

Population 9,709,000 (1990)

Natural increase: 2.78% per annum

Economic Indicators

GDP: US\$ 647 per capita (1987)

GNP: US\$ 660 per capita (1988)

Policy and Legislation The first legislation referring to protected areas in Zimbabwe (then Southern Rhodesia) was the Game and Fish Preservation Act, 1929 which designated land set aside for the preservation of natural communities. The Tsetse Fly Act, 1930 designated hunting areas in which all game animals were to be eliminated, and cancelled former restricted hunting areas. A number of Game and Fish Preservation Act amendments between 1931-5 proclaimed nine game reserves, and introduced prescribed management practices, such as grass burning and vermin control. The Natural Resources Act, 1941 protected landscapes and scenery for their aesthetic appeal and scenic values, and the Game and Fish Preservation Act amendments between 1947-9 established the first controls on the utilisation of certain areas by tourists. The National Parks Act, 1949-53 established the government Department of National Parks, and provided for the creation of two types of protected area, viz. national parks and game reserves. Shortly thereafter, the Federal National Parks Act, 1954 encompassed the administration of all national parks in Southern Rhodesia (Zimbabwe), Northern Rhodesia (Zambia) and Nyasaland (Malawi).

The above legislation was replaced by the Parks and Wildlife Act, 1975 (Act 14), amended on 1 January 1982. This Act provides for the establishment of national parks (Part II), with such areas usually being zoned into special conservation, wilderness, wild, development and/or safari areas; safari areas (Part V); recreational parks (Part VI); sanctuaries (Part IV); and botanical reserves and gardens (Part III) (see Annex). Together, these categories form the parks and wildlife estate. The Act also provides the framework for the establishment of a Parks and Wildlife Board, specifies the powers of the Director, officers and Minister with respect to protected areas, and regulates activities such as hunting, fishing and sailing within national parks. Further, the Act places utilisation of wildlife outside of protected areas in the hands of landowners, and redesignated certain conservation areas for specific types of tourist utilisation (US-AID, 1982). Accompanying this Act, are the Parks and Wildlife (General) Regulations, Statutory Instrument 900, 1981, which makes additional provisions with respect to the use of the parks and wildlife estate (see Annex) (IUCN, 1986). Subsidiary legislation includes the Parks and Wild Life (Hunting of Crocodiles and Removal of Crocodiles' Eggs) Notice,

1975 which lists areas in which the hunting or removal of crocodiles and their eggs are prohibited.

The Parks and Wildlife Act and Regulations are refined from time to time by area policy documents, approved by the Minister on the recommendations of the advisory Parks and Wildlife Board (IUCN, 1987b). These documents describe the key objectives for an area or group of areas, legislation and the preparation of management and development plans. A number of parks and reserves are a part of the estate of the late Cecil John Rhodes and as such are also covered by the terms of the Rhodes Estates Act of 1978.

The Forest Act (Cap. 125) of 9 December 1949, amended to 1981, makes provision for the creation and management of state forests and protected private forests (see Annex). The Act also defines demarcated forest, private forest, and private land; establishes a Forestry Commission; provides for the conservation of timber resources and the compulsory afforestation of private land; regulates the trade in forest produce; controls the use of fires and the burning of vegetation; outlines the duties and responsibilities of the Minister, conservator of forests, and forestry staff; and details offences and accompanying penalties in connection with the Act.

The Communal Land Forest Produce Act, 1987 repeals the earlier Communal Land Forest Produce Act (Cap 247) and the Tribal Trust Land Forest Produce Amendment Act (No. 41), 1981, and on communal lands allows for: local authorities to control the exploitation of forest produce within their areas of jurisdiction; establishes that revenues derived from exploitation of forest produce in communal land be paid directly to local authorities for the areas concerned; and stipulates that the Forestry Commission has statutory powers to conduct its operations on communal land. The Act also provides for the establishment of plantations, empowers the Minister of Natural Resources and Tourism to declare areas of communal land protected forest areas (see Annex), and sets out offences and accompanying penalties in association with the Act.

In April 1987, Zimbabwe published its national conservation strategy, among the first to be produced in Africa. On 22 September 1989, the government produced its Policy for Wildlife Document, which defined more precisely the objectives of the Department of National Parks and Wildlife Management (DNPWM) as laid out in the national conservation strategy, emphasising the protection and management of the parks and wildlife estate, the carrying out of ecological and other research relevant to the natural environment, and the promotion of wildlife management as an economic form of sustainable resource use (DNPWM, 1989).

International Activities Zimbabwe ratified the Convention Concerning the Protection of the World

Cultural and Natural Heritage (World Heritage Convention) in 1982 and has inscribed three sites on the World Heritage List, one of which is shared with Zambia. Zimbabwe is not party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), does not participate in the Unesco Man and the Biosphere (MAB) Programme, and at the regional level, is not signatory to the African Convention on the Conservation of Nature and Natural Resources (African Convention) which establishes several categories of protected area (Stuart and Adams, 1990).

Administration and Management Three departments and a single parastatal commission fall under the jurisdiction of the Ministry of Natural Resources and Tourism, the heads of which are advised by boards whose powers and responsibilities are laid down and defined by appropriate Acts. These are the Department of National Parks and Wildlife Management (DNPWM), advised by the Parks and Wildlife Board; the Department of Natural Resources, advised by the Natural Resources Board; the Department of Tourism, advised by the Tourist Board, and the Forestry Commission. The Boards have access to the Minister as well as to the departmental directors (CDC/IUCN, 1984).

In the early 1950s, the Department of National Parks was formed, while in 1960, a Game Department was created in pursuance of a game and tsetse control programme. In 1963, these two departments were amalgamated by virtue of the Parks and Wildlife Act, to form what is today known as the Department of National Parks and Wildlife Management (DNPWM) (US-AID, 1982). The DNPWM is responsible for the management, administration and development of the protected area system, and is charged with the conservation and proper use of the nation's wildlife resources. Specific objectives include: the administration and management of the parks and wildlife estate, which covers the protection of landscapes of special quality; the carrying out of ecological and other scientific research relating to the natural environment; the conservation of representative samples of natural ecosystems and all indigenous organisms; and the conservation and management of natural and semi-natural areas for a range of outdoor recreational pursuits for the long-term benefit, enjoyment and cultural inspiration of citizens and visitors (DNPWM, 1989; IUCN, 1987b). The DNPWM is the largest single land-use agency, but is currently under-staffed (CDC/IUCN, 1984; IUCN, 1988).

The Department of Natural Resources is responsible for promoting the implementation of policies designed to conserve and improve natural resources and the environment, and to ensure that the provisions of the Natural Resources Act and relevant legislation are observed. As of 1984, the Department had about 470 posts (CDC/IUCN, 1984).

By virtue of the Forest Act (Cap 125), the Forestry Commission was formed on 1 April 1954, and replaced the former Forestry Branch within the Department of Agriculture. This Commission consists of not less than three and not more than eight commissioners, one of which is appointed chairman by the President. Duties of this parastatal Commission are, *inter alia*: to advise the government on forest policy; to set aside and control sufficient land to safeguard the country's wood requirements, water and soil resources, and its scientifically or aesthetically valuable forests; to manage state forests and protected forests on communal land, as well as plantations and forest nurseries belonging to the state; to survey forest resources; and to conduct research into all matters pertaining to forestry and forest products. As of 1984, the Commission employed about 200 established officers, about 30 of whom were professionally qualified (CDC/IUCN, 1984).

Under the Parks and Wildlife Act, 1975, landowners or occupiers are responsible for wildlife on their properties, which has given many commercial farmers the incentive to develop their wildlife resources. Consequently, game ranching and farming is a booming industry, currently covering around 30,000 sq. km. The Wildlife Producers' Association, formed in 1985 by the Commercial Farmers' Union, has about 500 members who have partly or wholly made the transition from livestock to game (IUCN, 1988).

Objectives of the Wildlife Society of Zimbabwe are, *inter alia*: to support and encourage conservation-orientated research projects; to promote the establishment of wildlife areas; to procure the improvement of wildlife laws and the better observance of such laws; and to cooperate with the government and other organisations in furthering conservation initiatives. The Society also publishes a topical wildlife magazine (Pitman, 1986).

Systems Reviews Zimbabwe is a land-locked country bordered to the south by the Republic of South Africa, to the south-west and west by Botswana, to the north by Zambia and to the north-east and east by Mozambique. It lies on the great southern African central plateau, a continental shield complex that stretches across the country from the south-west to the north-east; the most notable feature of this plateau is the Great Dyke, a broad ridge about 650km long and 80km wide. From this, the topography descends gradually to the Zambezi Valley in the north and to the Limpopo-Save lowlands in the south. The high eastern rim of the central plateau extends for 450km along the border with Mozambique, forming the Chimanimani, Inyanga and Vumba mountains (Hughes and Hughes, 1991). Some 70% of the total land area is above 600m, and more than 99% is above 300m; elevations range between 300-2,592m (Sayer *et al.*, in press).

Zimbabwe falls mostly in the Zambezian biogeographic zone, with Afromontane elements in the eastern highlands (MacKinnon and MacKinnon, 1986). The

vegetation is predominantly dry miombo woodland (extensively cleared for agriculture), with mopane woodland in the Zambezi and Limpopo valleys and associated drainages. Grassland occurs along the Great Dyke in the centre of the country, while montane grassland, heath and about 80 sq. km of forest exist in the eastern highlands (Stuart and Adams, 1990). The west of the country is arid, and the north-western areas are covered by Kalahari sands. About 40% of the country is under permanent agriculture and/or pasture (MacKinnon and MacKinnon, 1986).

Wetlands are few, although the mid-Zambezi Valley and Mana Pools area, the wetlands of the Save River system, Gorhwe and Manjinji Pans, the pans of the Western District and the artificial impoundments of Lakes Kariba and Kyle are discussed by Hughes and Hughes (1991). Several of these fall within or adjacent to national parks or safari areas.

The development of the protected areas network can be traced back to the late 1920s, when land was set aside for conservation purposes. Subsequently, nine game reserves were established in the 1930s, and by 1954, there were 14 national parks totalling some 2 million ha in the country, then known as Southern Rhodesia. Upon creation of the Department of National Parks and Wildlife Management in 1963, the wildlife estate consisted of 13 national parks, 8 game reserves and 5 controlled hunting areas (US-AID, 1982). Today, the Parks and Wildlife Estate, consisting of national parks, safari areas, recreational parks and other conservation areas covers more than 5 million hectares or about 13% of the total area of the country. State forests, comprising reserves serving protection, production and plantation functions, cover over 900,000ha or about 2.4% of total area. Indigenous moist forests protected under this category in the Eastern Districts totals 7,027ha, while the area of demarcated indigenous (production) forests administered by the Forestry Commission in Matabeleland and the Midlands totals 835,543ha; these latter forests are all dry indigenous woodlands on Kalahari sands. Protected forests, found on communal land, cover some 609 sq. km, but are inadequately protected (Forestry Commission, pers. comm., 1986, 1990). Agricultural land (incorporating the categories of LSCF, SSCF, communal and resettlement areas) total 33.06 million ha, or 85% of the country (MacKinnon and MacKinnon, 1986).

Certain priorities to develop the protected areas network have been identified in MacKinnon and MacKinnon (1986), IUCN (1987a) and Stuart and Adams (1990). Important additions to the protected areas network would include: parts of the Great Dyke to conserve endemic plants (this could be done by extending Sebakwe Recreational Park); lowland forests in the Lusitu-Haroni area in the south-east of the country; extending Chimanimani National Park to include a wider area of quartz grassland and forest, known to contain endemic wildlife; and the designation of a reserve to protect the *Parinari* forests. Further, Chegutu (Hartley

A) and Chipinga safari areas require improved protection and management (IUCN, 1987a).

In an attempt to foster appreciation of protected areas by local populations, the Department of National Parks and Wildlife Management introduced the buffer-zone concept in 1960. Considerable emphasis is placed on the role of protected areas in raising rural living standards and generating material revenue through domestic and foreign tourism and utilisation of wildlife (Child, 1984a). Where management actions (which are determined by ecological considerations) in a national park are undertaken, useful products are disposed of either to local people, or to the best financial advantage (Child, 1984b).

Outside protected areas efforts are being made in various parts of the country to develop more rational land-use policies in inhabited areas. At the beginning of 1990, a total of 13 districts had the right to implement Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) projects, which must receive approval from the Parks Department, which originated the concept. The project relates to all natural resource management on communally owned land, and is not a policy for state or private lands. It has been most successful in areas with low human density, adjacent to protected areas with wildlife populations. As an example, the Nyaminyami Wildlife Management Trust made over US\$ 200,000 net profit from international sport hunting alone in its first year of community management. The estimated total revenue from hunting safaris in these areas is about US\$ 4 million, of which about 50% accrues directly to the districts involved (Metcalf, 1990).

Rhino poaching in the Zambezi Valley and in Gonarezhou National Park is a serious problem, while Gonarezhou requires further protection from pastoralists and refugees (IUCN, 1987a). Dieldrin and DDT have been extensively used up to the present time in the Zambezi Valley and other areas in tsetse fly control programmes; this has had significant effects on wildlife such as fish eagles, and has affected humans as well (IUCN, 1988).

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Zimbabwe Trust (Director for the Community Wildlife Management Programme), PO Box 4027, HARARE

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ANNEX

**Definitions of protected area designations, as legislated,
together with authorities responsible for their administration**

Title: Parks and Wildlife Act No. 14

Date: 1975, amended 1 January 1982

Brief description: Provides for the establishment of a parks and wildlife board; allows for the creation of national parks, botanical reserves, sanctuaries, safari areas and recreational parks; and prohibits and regulates certain activities in such areas.

Administrative Authority: Department of National Parks and Wildlife Management (Director)

Designations:

National park (Part II)

Established to protect landscapes, conserve ecosystems and their elements (with particular emphasis on large mammals and their habitats), and to protect important sites for research, education and their intrinsic aesthetic value. They normally contain of one or more of the following zones:

Special conservation area Usually small and designed to protect especially sensitive biological features, or for defined research, with access strictly controlled.

Wilderness area Areas in which visitor access is strictly controlled, with the level of development depending on local conditions.

Wild area Areas with greater visitor access and improved roads.

Development area Areas in which staff and tourist infrastructure is developed.

Safari area Areas in which controlled hunting is permitted.

Botanical reserve and botanical garden (Part III) Such areas preserve and protect rare or endangered wild-growing indigenous plants or representative plant communities, for the enjoyment, education and benefit of the public.

Sanctuary (Part IV) Such areas afford special protection to all or particular species of animals for the enjoyment and benefit of the public

Safari area (Part V) The following activities are permitted: controlled sport hunting; camping; hiking and fishing; and wild populations may be harvested or otherwise used providing that this is not in conflict with species/ecosystem conservation, or with the wilderness qualities or future resource values of the area.

Recreational park (Part VI) Usually associated with larger dams which are established to preserve and protect the natural features for the enjoyment, long-term benefit, cultural inspiration and recreation of the people of Zimbabwe and visitors.

Source: Original legislation

Title: Parks and Wildlife (General) Regulations (Statutory Instrument 900)

Date: 18 December 1981

Brief description: Implements certain provisions of the Parks and Wildlife Act, 1975, particularly regulations regarding hunting and fishing in parks, and sets fees for various activities within protected areas.

Administrative Authority: Department of National Parks and Wildlife Management (DNPMW) (Director)

Designations:

Establishes times and places of entry into the parks and wildlife estate, viz. national parks, sanctuaries, botanical reserves, safari areas and recreational parks, and prohibits certain activities within these areas, including off-road driving, possession of wildlife without a permit, feeding animals, and unauthorised possession of domesticated animals.

Makes special provisions relating to wilderness areas with regard to entry, methods of travel and precautionary measures.

Prohibits and prescribes hunting and fishing methods within the parks and wildlife estate.

Prescribes precautionary legislation with regard to the introduction of the aquatic weeds *Salvinia* spp. and *Eichornia crassipes*.

Refers to special provisions relating to leased areas of the parks and wildlife estate.

Source: Original legislation

Title: The Forest Act (Cap 125)

Date: 9 December 1949, amended to 1981

Brief Description: Provides for the management of the forest estate, and the establishment of state forests and private protected forests

Administrative Authority: Forestry Commission (Chief Conservator)

Designations:

State forest

Means any demarcated or undemarcated forest Unless authorised, prohibited activities in state forests or private forests include: cutting, felling, injuring, collecting, destroying or removing any tree, timber or other forest produce; injuring, removing or interfering with any beacon, boundary mark or fence; lighting any fire; and entering any part where entry is prohibited by notice.

Other activities prohibited include: clearing, or cultivating land; and climbing through or over any fence or gate.

Demarcated forest The President may, on the recommendation of the Forestry Commission declare a demarcated forest, or add to, subtract from, or abolish any such area by notice published in the *Gazette*.

Demarcated forests are those which are either on state land or on trust land where the trustees have consented to the demarcation.

Private forest Means a forest, plantation, or tree situated on land not owned by the state.

Protected private forest The owner of any private land may make an application to the Minister to have such land protected under the provisions of this Act. If accepted, the Minister publishes a notice in the *Gazette* declaring that such an area is so protected.

Prohibited activities as for state forests above.

Source: Original legislation

Title: Communal Land Forest Produce Act

Date: 1987

Brief description: Provides for the management of forest resources on communal land and allowing for the establishment of plantations and protected forest areas.

Administrative Authority: Forestry Commission (Chief Conservator)

Designations:

Communal Land Unless authorised, any person who exploits, injures or destroys any forest produce on such lands shall be guilty of an offence.

Protected forest area The Minister may, by notice published in the *Gazette*, declare any area of natural forest to be a protected forest area wherein the exploitation of all major forest produce by all persons or any classes of persons that may be specified is prohibited, unless authorised.

The cutting of timber in such areas is prohibited except by holders of permits.

Plantation Without the authority of the person who controls a plantation on communal land, the following activities are prohibited: exploiting, injuring or destroying any forest produce; trespassing in areas which are prohibited by notice; the lighting of fires; the depasturing of livestock; or the damaging, moving or interfering with a notice or notice-board.

Source: Original legislation

SUMMARY OF PROTECTED AREAS

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
<i>National Parks</i>				
1	Chimanimani	II	17,100	1950
2	Chizarira	II	191,000	1975
3	Gonarezhou	II	505,300	1975
4	Hwange (Wankie)	II	1,465,100	1949
5	Kazuma Pan	II	31,300	1975
6	Mana Pools	II	219,600	1975
7	Matobo (Matopos)	II	42,500	1926
8	Matusadona	II	140,700	1975
9	Nyanga	II	33,000	1950
10	Victoria Falls	III	2,000	1952
11	Zambezi	II	56,300	1979
<i>Sanctuaries</i>				
12	Chimanimani Eland	IV	1,800	1975
13	Mushandike	IV	12,900	1975
14	Nyamaneche	IV	2,480	
15	Tshabalala	IV	1,100	
<i>Safari Areas</i>				
16	Charara	VIII	169,400	1975
17	Chegutu (Hartley A)	VIII	44,500	1975
18	Chete	VIII	108,100	1975
19	Chewore	VIII	339,000	1964
20	Chipinge	VIII	26,100	1975
21	Chirisa	VIII	171,300	1975
22	Dande	VIII	52,300	1975
23	Deka	VIII	51,000	1975
24	Doma	VIII	94,500	1975
25	Hurungwe	VIII	287,800	1975
26	Malipati	VIII	15,400	1975
27	Matetsi	VIII	295,500	1975
28	Mfurundzi	VIII	76,000	1976
29	Sapi	VIII	118,000	1975
30	Sibilobilo Islands	VIII	2,270	1979
31	Tuli	VIII	41,600	1975
<i>Recreation Parks</i>				
32	Bangala	V	2,700	1975
33	Darwendale	V	11,200	
34	Kariba	V	283,000	1979
35	Kyle	V	16,910	1975

Map [†] ref.	National/international designations Name of area	IUCN management category	Area (ha)	Year notified
36	Manjirenji	V	3,400	
37	McIlwaine	V	6,100	1975
38	Mufuli	V	12,700	
39	Muzingwane	V	1,233	1975
40	Ngezi	V	5,800	1975
41	Sebakwe	V	2,600	1975
<hr/>				
	<i>World Heritage Sites</i>			
	Mana Pools National Park, Sapi and Chewore Safari Areas	X	1,092,300	1984
	Victoria Falls/Mosi-oa-Tunya	X	3,081	1989

Category VIII forest reserves are neither listed nor mapped.

[†]Locations of some protected areas are shown on the accompanying map.



Protected Areas of Zimbabwe

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