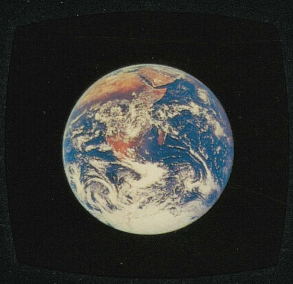
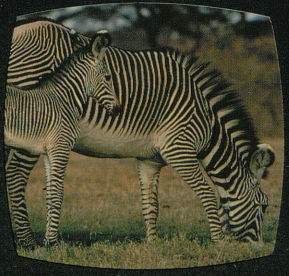
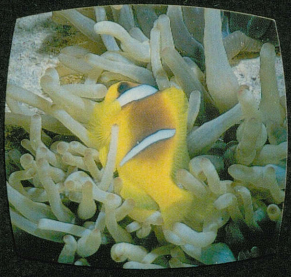


Conservation Monitoring Centre





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Building the World's Conservation Database

Plants and animals provide the basis for us to live on this green planet. The natural communities they form protect fragile soils from erosion, regulate the atmosphere, maintain water supplies and prevent the formation of deserts. Individual plants and animals provide food, medicine, timber and a host of other products essential to our lives. Without them we could not survive.

Yet people are destroying natural habitats at an ever-increasing rate. As many as 40,000 plants – one in six of the world's total – could disappear by the middle of the next century if nothing is done. Some might have provided new medicines, others new foods.

The problem is large and pervasive and there is no easy solution since development must necessarily proceed. But it is not impossible to resolve this apparent dilemma. The World Conservation Strategy, a global plan for conservation of living resources, explains how the diversity of species and ecosystems will survive only if the issues of conservation are taken into account at all levels of developmental decision-making, from the government minister to the practical man on the farm.

Data are the building-blocks for conservation

For this to happen there must be accurate and timely information. Politicians need to know, for example, which natural forests in their country contain the wild relatives of important food crops, which parts of their coast are vital breeding grounds for fish and shellfish, and which of their wetlands are vital stopping-off places for migratory birds. There has to be a baseline from which decisions can be made and priorities assigned.

While many organizations promote conservation on a local or national scale, there is also a pressing need for an international approach, a planet-wide view of conservation. Only this can provide the knowledge to assess priorities among countries or supply rapid answers regarding issues in any part of the world. It can also fill the gaps, providing data on those countries where effective conservation organizations are yet to be developed. These unfortunately tend to be the places where most species are threatened and the issues of conservation and development are most pressing.

Providing a service to conservation and Industry

The International Union for Conservation of Nature and Natural Resources (IUCN) established the Conservation Monitoring Centre (CMC) in January 1983 to provide this information service on global conservation – to ensure that the facts are correct and that they are in the right hands at the right time.

The users of CMC include the planning and programming divisions of IUCN and its sister organization, the World Wildlife Fund (WWF). Then there are the governments, government agencies and non-governmental organizations (citizen groups) that make up the membership of IUCN. The users also include international development banks and aid agencies, as well as the business and commercial community, and of course the media. CMC primarily provides a service to organizations, rather than to the public directly.

CMC is not a think-tank on global issues but rather provides an information bank on all of the hundreds of facts and trends which make up world conservation. CMC's strength lies in its ability to assess in detail and link the data on many thousands of species and areas, providing a reliable and comprehensive data service to those who need it and can use it.

What does the Conservation Monitoring Centre do?

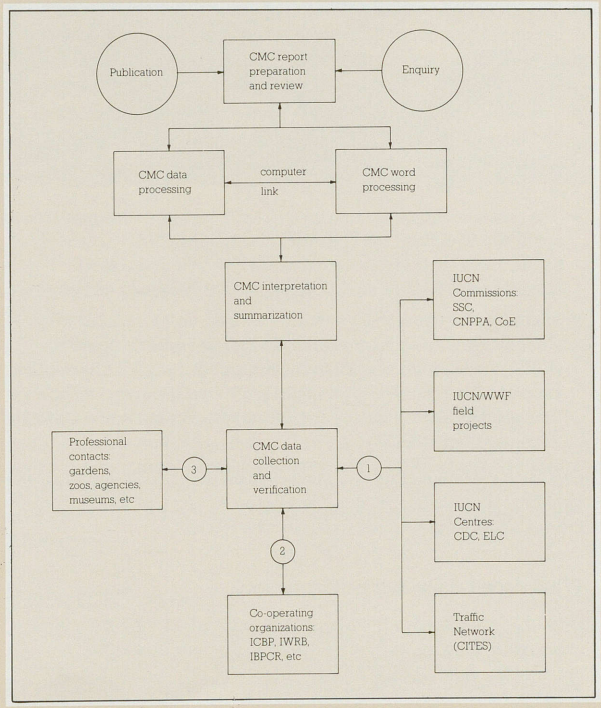
The primary function of CMC is the continuous collection, analysis, interpretation and dissemination of data as a basis for conservation. Species, habitats and areas of relevant conservation concern include those having current or potential economic import as well as those believed to be under threat.

CMC undertakes its function by integrating four monitoring activities (our major management units) which cover the status of:

- Animal species (Species Conservation Monitoring Unit)
- Plant species (Threatened Plants Unit)
- Wildlife trade (Wildlife Trade Monitoring Unit)
- Protected areas (Protected Areas Data Unit)

Data resulting from these activities are linked by common geographical and taxonomic coding systems within the computer. The result is a highly sophisticated database capable of producing integrated outputs on a wide range of contemporary conservation issues.

CMC disseminates this information through a series of publications, including the renowned IUCN Red Data Books on plants and animals, and by producing special reports tailored to the needs of clients.



To collect the data the CMC system relies on contacts within the 'official' IUCN/WWF family, colleagues in other organizations, and individual contacts.

Where does the information come from?

The accuracy and relevance of CMC's data are owed to an unrivalled network of organizations and specialists all over the world. These include:

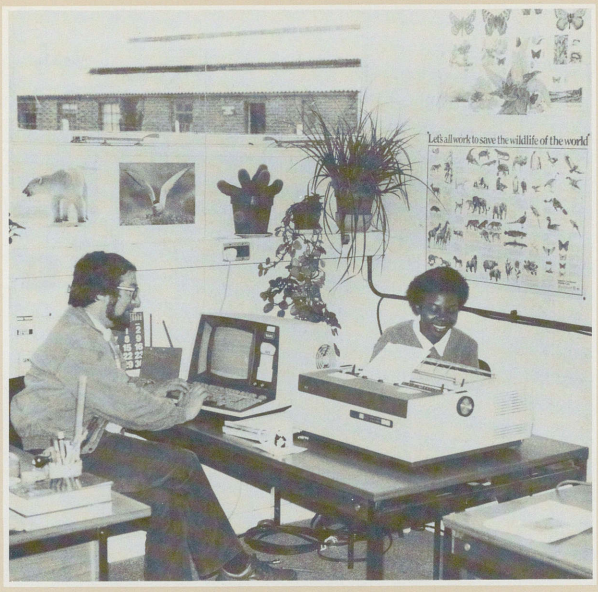
- The network of IUCN members, which include governments, government agencies and non-governmental organizations that make IUCN the international union of conservation organizations.
- The international network of scientists and other co-operators affiliated to IUCN and its six commissions. Our principal contacts, the combined memberships of the Species Survival Commission, the Commission on National Parks and Protected Areas and the Commission on Ecology, number over 2,000 individuals worldwide.
- The researchers under contract for over 300 IUCN/WWF field projects annually.
- The IUCN Environmental Law Centre, which provides a similar service to ours but on legal matters, and the IUCN Conservation for Development Centre, which maintains a roster of consultants able to undertake conservation and development projects.
- The network of TRAFFIC offices (Trade Records Analysis of Flora and Fauna In Commerce). Established in several countries, each office monitors trade in wildlife to and from its region. CMC co-ordinates them and draws on their data.
- The professional contacts set up by CMC staff with colleagues around the world. CMC staff call upon the knowledge and experience of scientists and conservation experts who work in government agencies, universities, zoos, botanic gardens, museums and libraries.
- International organizations with whom we co-operate. In particular CMC works with the International Council for Bird Preservation (ICBP), the International Wildfowl Research Bureau (IWRB), the UN Food and Agriculture Organization (FAO), the UN Environment Programme (UNEP), and the UN Educational, Scientific and Cultural Organisation (UNESCO).

CMC staff are thus in direct contact with those individuals who are at the forefront of conservation action. On any one subject CMC staff can seek the guidance of the foremost experts in the world.

What do we do with the information?

Once the raw data have been collected and verified, they are critically interpreted, summarized and entered into the computer in two different yet complementary forms:

- *Text files* are handled in a word-processing system and can be as detailed and extensive as required. They can be rapidly modified to incorporate new information.



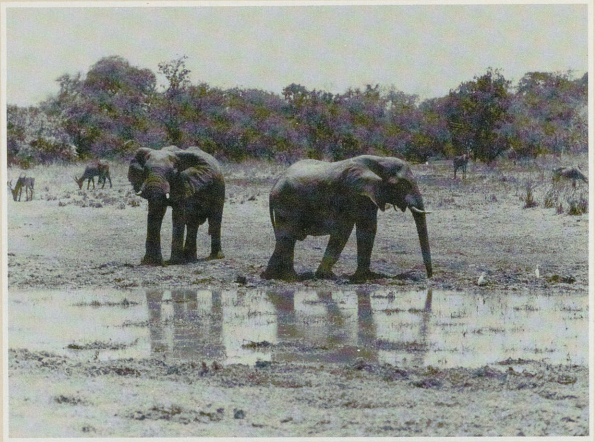
N.M. Collins

- *Data files* are stored in the computer as coded summaries which permit rapid processing and analysis. Coded data are used since computers cannot efficiently sort and extract information from plain text.

The two types of file are linked by common geographical and taxonomic codes. This dual approach produces an unusually flexible system, giving CMC the advantage of rapid computer selection and sorting of information but avoiding the problem of forcing variable biological data into a rigid data processing format. The information on computer is backed up by more detailed material on manual files and the capability to locate and contact the relevant experts on any particular issue. CMC is thus well equipped to respond rapidly and accurately to requests for information.

How is CMC organized?

The Centre is based in the United Kingdom, with headquarters at Cambridge and a facility at Kew Gardens (near London). The Directorate includes computer support and publication units. Otherwise CMC's work is functionally divided into four sections (animals, plants, wildlife trade, and protected areas) whose activities are described below.



F. Vollmar/WWF

Monitoring the status of animals

Animals, particularly vertebrates, have been the traditional focus of many IUCN/WWF conservation projects. This emphasis has generated a demand from many sectors for quite specific data on the conservation status of a wide range of animal species. Monitoring activities have consequently developed to answer this demand and led to the publication of the internationally respected IUCN Red Data Books, a series of authoritative references on threatened species. Collection of data for this series continues to provide an important focus for CMC's work.

However the collection of data is not confined just to threatened species. The database includes information on all species of conservation concern, including widespread but depleted wild taxa of economic importance, and wild relatives of domestic stock.

Although continually under development, the animal data file currently contains summary information on 18,000 taxa of conservation concern. Detailed Red Data Book accounts have been prepared for 1,300 of these taxa. These sheets provide comprehensive information on distribution, population status, habitat needs, ecology, threats to survival and proposed conservation measures, along with a comprehensive reference list.

Information on individual species is available for many of the higher vertebrates but different approaches have had to be developed for the less studied lower vertebrates and invertebrates. These approaches have included the collection of data on an area basis, e.g. on such specific places as the Banks Peninsula in New Zealand or the Usambara Mountains in Tanzania, or on specific habitats such as coral reefs. This work links up with other area-based information in the CMC database, particularly that on plant sites and protected areas.

Monitoring the status of plants

The increasing demand for information on the conservation status of plants has accompanied the growing realization that these species are critical for maintaining the ecosystems upon which mankind relies. In 1970 only Belgium had produced a list of its threatened plants. Today, virtually all countries of the geopolitical 'North' (including Australia, New Zealand and South Africa) have produced threatened plants lists, often as national Red Data Books. Many countries of the 'South' are now taking similar action. This rapid progress has coincided with a decade of intense activity by IUCN on threatened plants, much of it dedicated to encouraging and helping countries to document their threatened plants.

With estimates of the world's threatened flora ranging up to 40,000 species, no one book could attempt to list them all, let alone describe them in detail. However, with computer assistance, CMC is able to monitor a major proportion of the key species identified by our information networks. Although still under development, the CMC database now holds basic information on 14,000 threatened plants and provides a basis on which to plan the conservation of plants around the world.

Knowing which species are threatened in the wild also enables CMC to monitor their status *ex situ* (off-site), principally in botanic gardens. The plant data file is used to produce lists of threatened species which are circulated to the 130 gardens that subscribe to IUCN's Botanic Gardens Conservation Co-ordinating Body. The aim is to help gardens work as a network, avoiding duplication of conservation efforts and contributing to the cause of preserving plant genetic resources.

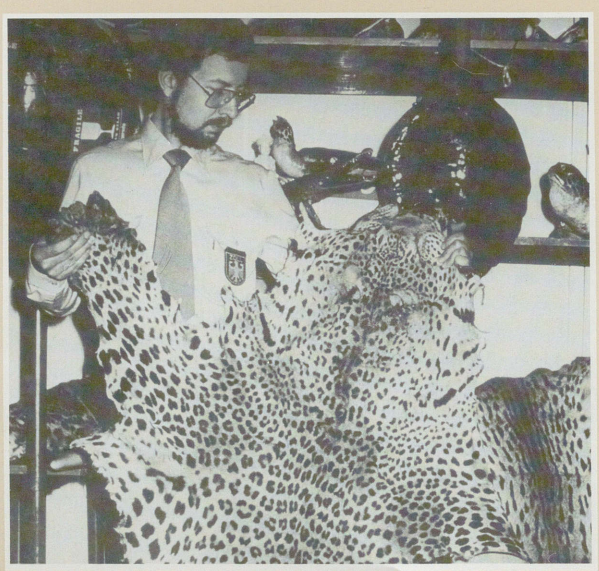
W. Dolder/WWF

Whereas the plant data file contains many species found in temperate and subtropical climates or on islands, most of the world's plants occur in the less studied mainland tropics where habitat destruction is accelerating. Because of the size of the flora involved in these areas, a species approach is less practical, and alternatives are being investigated. These include gathering data on specific groups of plants such as those of economic or medicinal value, or those threatened by trade or habitat destruction. These floristic data are being used to identify key sites for conservation, leading to the publication of a Plant Sites Directory that identifies which areas of the world are most significant for plant conservation.

Monitoring wildlife trade

Trade in wild species and their products has become a multimillion dollar enterprise, encompassing many diverse products ranging from rhino horn to coral and from exotic butterflies to tropical hardwoods. Trade in threatened species of animals and plants has particularly aroused public concern. Through its Wildlife Trade Monitoring Unit, CMC collects information on the volume and trends of all such trade, and especially on the implementation and effectiveness of the international measures designed to control it.

One of the major initiatives in this area is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Parties to CITES are required to submit annual reports to the



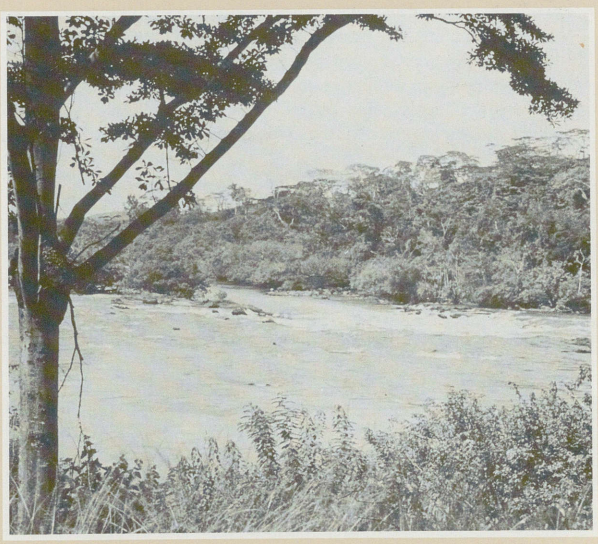
C.A.v. Treuenfels/WWF

CITES Secretariat, detailing permits issued for international trade in taxa protected by the Convention. Data from these reports are managed by CMC under contract to the CITES Secretariat. Currently 290,000 records of wildlife trade transactions are logged on the computer, representing reports submitted to CITES over the last ten years.

The CITES data are complemented by information collected from consultants and correspondents around the world, from the 'TRAFFIC' network of national trade monitoring offices, from reports on wildlife trade and from the published import and export statistics for a number of countries. Coupling this extensive data file with those for animals and plants has enabled CMC to undertake a wide variety of special trade analyses under contract to international and governmental agencies, non-governmental organizations, and trade associations. Such projects have included analyses of wildlife farming and ranching, international trade in elephant ivory, international trade in marine mammals, and the extent of trade in kangaroos, seals and corals. The *Traffic Bulletin*, published quarterly carries reports on these special analyses, as well as recent trade news.

Monitoring protected areas

A principal method used for the conservation of species and ecosystems is the protection of sites. To be able to plan effectively, conservation agencies need to know which sites are already protected, how successfully they are managed, and what they contain in terms of animals, plants and critical habitats. CMC maintains a comprehensive



P. Steele/CCF.

overview of protected areas around the world, with summary data in the computer on 9,500 sites and detailed accounts on 3,200 of these.

At the request of the United Nations, a summary of the protected areas data file is published biennially as the UN List of National Parks and Protected Areas. CMC also publishes detailed accounts of sites occurring in various realms of the world in the series of IUCN Directories of Protected Areas.

Apart from the ability to provide information on protected areas to interested parties, the linking of this information with other files in the database enables CMC to identify significant gaps in protected area coverage worldwide and subsequently to help plan conservation action. In particular, new approaches are being undertaken to compare protected area coverage with centres of species endemism and diversity, and to locate valuable genetic resources within protected areas.

Given our extensive experience in management of large, text-based databases, CMC has also developed databases on sites of concern under contract to other organizations. Such efforts have recently included maintaining a database for UNESCO on sites listed under the World Heritage Convention, assisting them further by managing information on Biosphere Reserves, and establishing a prototype database on sites of interest for the Ramsar Wetlands Convention.

How does it all fit together?

CMC is capable of producing integrated outputs which draw upon all files within the database. This is possible because the information is linked by a common skeleton of taxonomic and geographic names, and synonyms of names may be used as well. The system also records the relationship of names to others within a variety of hierarchical arrays (e.g., species within families, counties within states). Sorting of data files to obtain the information needed by clients can thus be accomplished quickly, and the linkage of data files with the text files enables reports to be developed rapidly.

CMC is also developing new database components, drawing information from the four existing major data files. In particular, area-based information is being synthesized for specific habitats which will be the subject of new international conservation initiatives: coral reefs, wetlands, and oceanic islands.

What has CMC achieved?

CMC is a young organization and has spent much time developing the conservation database. Nevertheless the following achievements illustrate that the Centre has already progressed well towards the goal of being able to provide timely advice on conservation and development issues.

We have:

- ***Defined new areas of conservation concern.*** CMC published the IUCN Invertebrate Red Data Book in 1983 as the first attempt to publicize the worth of invertebrates and to indicate the plight faced by many such species. The book has sold well and has been reviewed internationally from Chile to Hong Kong. Many important initiatives including field projects, surveys, captive breeding programmes, meetings and legislation followed its publication.

- ***Developed a lead in plant conservation.*** During 1983–84 CMC helped prepare the IUCN/WWF programme and campaign to promote plant conservation around the world. The database showed which places in the world had the greatest diversity of plant life and where among these places the threats were most acute, a vital ingredient for choosing the limited number of countries in which IUCN/WWF could reasonably sponsor projects. The programme is now running and with its combination of strategic and field projects, it not only sets new ground for IUCN/WWF, but is beginning to make plant conservation a more accepted part of conservation as a whole.

- ***Helped conservation organizations lobby governments better.*** In early 1983 a wealthy American asked the British Government for permission to settle on Henderson Island, an uninhabited coral island in the middle of the Pacific. At the request of WWF, CMC assisted in the preparation of a report for submission to the British Government regarding the island's unique flora and fauna. Since a major

recommendation of this report was that the island should be listed as one of UNESCO's Biosphere Reserves, CMC's and WWF's efforts were rewarded when the Government announced that Henderson Island would not be settled.

- ***Provided crucial statistics on success of conservation measures.*** In 1983, CMC informed the Parties to CITES at their regular biennial meeting that as much as 45% of transactions in animal trade and 79% in plant trade in species of concern to CITES were not being reported as required. The analysis indicated that the Parties had far to go in making CITES an effective conservation body. CMC's ability to supply such precise figures provides powerful incentive for concerned governments and bodies to improve their compliance with agreed measures.

- ***Assisted forward planning for development projects.*** During 1984–85 CMC assisted the development community through the provision of conservation briefings. These are résumés of available information on threatened species, critical habitats, parks and reserves, along with pertinent bibliographic citations and contact names, which indicate the key conservation issues that a potential development might encounter. Clients, including the World Bank and British Petroleum, have indicated that such briefings tailored to their specific needs have been extremely useful in pre-project planning and evaluation.

How may CMC assist you?

The Conservation Monitoring Centre would be pleased to assist your activities through the provision of:

- Information Services
- Conservation Briefings
- Integrative Analyses
- Special Studies
- Publications or Publishing Services
- Database Management or Development Services

Enquiries about our specific capabilities in each of these areas should be addressed to:

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CMC Publications

IUCN Red Data Book Series

Plant Red Data Book. 1980.
Amphibia/Reptilia Red Data Book Part 1. Testudines, Crocodilia Rhynchocephalia. 1982.
Mammal Red Data Book Part 1. The Americas and Australasia. 1982.
Invertebrate Red Data Book. 1983.
Threatened Birds of Africa and Related Islands: The ICBP/IUCN Red Data Book. 1985.
Threatened Swallowtail Butterflies of the World: The IUCN Red Data Book. 1985.

Directories

Directory of Neotropical Protected Areas. 1982 IUCN/CNPPA
Directory of Afrotropical Protected Areas. 1985 IUCN/CNPPA
1982 United Nations List of National Parks and Protected Areas. IUCN/CNPPA
1985 United Nations List of National Parks and Protected Areas IUCN/CNPPA
Directory of Crocodilian Farming Operations. 1985.
Traffic Bulletin. Issued Quarterly. Wildlife Trade Monitoring Unit

Projects and Commissions

A Preliminary Environmental Profile of the India/Pakistan Borderlands in the Sind-Kutch Region. 1983.
A Preliminary Report on Threatened and Endemic Vertebrate Species in Ethiopia. 1984.
A Preliminary Report on Threatened Species and Areas in Madhya Pradesh, India. 1984.
Wild Cattle, Bison and Buffaloes, Their Status and Potential Value. 1984
Environmental Profile of Madagascar. 1985.

Publications in Preparation

Threatened Fishes of North America: IUCN Red Data Book
Directory of Coral Reefs
Mammal Red Data Book Part 2. Africa.
Amphibia/Reptilia Red Data Book Part 2.
Threatened Birds of The Americas. ICBP/IUCN Red Data Book
Cetacean Red Data Book.
Directory of Indomalayan Protected Areas.
Directory of Protected Areas in Oceania

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