Rationalization of International Nature Conservation Information Systems

Final Report
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DEFRA Research Project CR0252

The ORBIS INSTITUTE

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WCMC

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List of Abbreviations and Acronyms (inclusive of Annexes)

ABC	Australian Broadcasting Corporation
ARKive	Project short-name of the Wildscreen Trust
ASCIs	Areas of Special Conservation Interest
BBC	British Broadcasting Corporation
BCIS	Biodiversity Conservation Information System
BDM	Biodiversity Data Management (UNEP-GEF project)
BEG	Biodiversity Expert Group (of European Commission)
BGBM	Botanischer Garten und Museum Berlin-Dahlem
BGCI	Botanic Gardens Conservation International
BioNET	Biological network (part of CABI)
BIOSIS	Legal tradename of Biological Abstracts Inc
BRIM	Biosphere Reserves Integrated Monitoring
BRU	Biodiversity Reporting Unit
CABI	CAB International (former Commonwealth Agricultural Bureau)
CABRI	Common Access to Biological Resources and Information Service
CBD	Convention on Biological Diversity
CBD-CHM	CBD Clearing-House Mechanism
CDDA	Common Database on Designated Areas
CEE	Central and Eastern Europe
CEEC	Central and Eastern European Countries
CEH	Centre for Ecology and Hydrology (UK)
CELEX	Centre for Lexical information
CELIB	Computerised Environmental Law Information Base (UNEP)
CGRS	Chorological Grid Reference System
CHM	Clearing-House Mechanism
CIDA	Canadian International Development Agency
CIDS	Inter-American Committee on Sustainable Development
CIESIN	Consortium for the International Earth Science Information Network
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
COM	Prefix identifier for official meetings and documents of the European Commission
COP	Conference of Parties (COP7 would refer to the seventh COP)
CORINE	Coordination of Information on the Environment (EEA)
CSD	Commission for Sustainable Development (UN)
CURIA	Court of Justice and Court of First Instance (EU)
DAC	Development Assistance Committee (OECD)
DANIDA	Danish International Development Agency
DCMS	Department for Culture, Media and Sport (UK)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DEWA	Division of Early Warning and Assessment (UNEP)
DfID	Department for International Development (UK)
DG	Directorate General (of EC)
DISP	Donor Information Sharing Project
EAP	Environmental Action Plan
EBMI-F	European Biodiversity Monitoring and Indicator Framework
EC	European Commission or European Community
EC-CHM	EC Clearing-House Mechanism
ECN	Environmental Change Network (UK)
ECNC	European Centre for Nature Conservation
ECOLEX	Short name for Environmental Law information system of IUCN & UNEP.
EEA	European Environment Agency
EFNCP	European Forum for Nature Conservation and Pastoralism

EIONET	European Environment Information and Observation Network
ELC	Environmental Law Centre (of IUCN)
ELIS	Environmental Law Information System
EMAN	Ecological Monitoring and Assessment Network (Canada)
EMG	Environmental Management Group
ENBI	European Network for Biodiversity Information
ENHSIN	European Natural History Specimen Information Network
ENVOC	Environmental Vocabulary (UNEP)
ETC	European Topic Centre
ETC/CDS	European Topic Centre / Catalogue of Data Sources
ETC/NPB	European Topic Centre / Nature Protection and Biodiversity
EU	European Union
EUCC	European Union for Coastal Conservation
EUNIS	European Nature Information System
EUR-Lex	Short name for European law information system
EuroMAB	European Man and Biosphere programme
EUR-OP	Office for Official Publications (of the EC)
Europarc	Umbrella organisation of Europe's protected areas
Eurosite	Network of organisations managing Europe's natural heritage
Eurostat	Statistical Office of the European Communities
EWD	European Wildlife Division (of DEFRA)
FAO	Food and Agriculture Organization (UN)
FAOLEX	Short name for FAO law information system
FFI	Fauna and Flora International
FIELD	Foundation for International Environmental Law and Development
FishBase	Database of fish species information (The World Fish Centre)
FCO	Foreign and Commonwealth Office (UK)
G3OS	Referring collectively to the 3 Global Observing Systems (GCOS, GOOS, GTOS)
GBIF	Global Biodiversity Information Facility
GCOS	Global Climate Observing System
GEF	Global Environment Facility
GEMET	General Multilingual Environmental Thesaurus
GEMS	Global Environment Monitoring System (UNEP)
GEO	Global Environmental Outlook (GEO-3 referring to the third edition)
GIS	Geographic Information System (generic term)
GISP	Global Invasive Species Programme
GOOS	Global Ocean Observing System
GOSIC	Global Observing Systems Information Centre
GRID	Global Resource Information Database (UNEP)
GROMS	Global Register of Migratory Species
GTI	Global Taxonomy Initiative (of CBD)
GTOS	Global Terrestrial Observing System
GTZ	Gesellschaft fur Technische Zusammenarbeit (Germany)
GWD	Global Wildlife Division (of DEFRA)
HELCOM	Short name for Helsinki Convention
HTML	Hyper-Text Markup Language
IABIN	Inter-American Biodiversity Information Network
IAC	Informal Advisory Committee (to the CBD-CHM)
IACSD	Inter-Agency Committee on Sustainable Development
IBA	Important Bird Area (of Europe)
ICP	International Co-operative Programmes (of UN-ECE)
ICP/IM	International Co-operative Programme/ Integrated Monitoring (of UN-ECE)
ICSU	International Council for Science
IEEP	Institute for European Environmental Policy
IGO	Inter-Governmental Organization
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development

ILTER	International Long-Term Ecological Research Network
IMG	Issues Management Group
INBio	Instituto Nacional de Biodiversidad (Costa Rica)
IPNI	International Plant Name Index
ISIS	International Species Information System
ISO	International Organization for Standardisation
ITIS	Integrated Taxonomic Information System
IUBS	International Union for Biological Sciences
IUCN	World Conservation Union
IUCN-ELC	IUCN Environmental Law Centre
IUCN-SIS	IUCN Species Information System
IUCN-SSC	IUCN Species Service Commission
IUCN-WCPA	IUCN World Commission on Protected Areas
JNCC	Joint Nature Conservation Committee (UK)
LTER	Long Term Ecological Research (USA)
MAB	Man and the Biosphere programme (of UNESCO)
MAP	Mediterranean Action Plan (of UNEP)
MCE	Main Component Elements (of EIONET)
MEA	Multilateral Environmental Agreement
MEP	Member of European Parliament
MNHN	Muséum National d'Histoire Naturelle (France)
NATLAN	NATure/LANd Cover Information Package (EEA)
NatureServe	Organisation name (Partner of the Nature Conservancy)
NERC	Natural Environment Research Council (UK)
NFP	National Focal Point
NGO	Non-Governmental Organization
NHM	Natural History Museum (UK)
NIS	Newly Independent States
NoLIMITS	Networking of Long-term Integrated Monitoring in Terrestrial Systems (EC project)
NRC	National Reference Centre (of EIONET)
NSF	National Science Foundation (USA)
ODBC	Open Data Base Connector
OECD	Organization for Economic Cooperation and Development
OECD/DAC	OECD Development Assistance Committee
OSPAR	Oslo and Paris (short name for Convention for the Protection of the Marine Fisheries of the North East Atlantic)
PEBLDS	Pan European Biological and Landscape Diversity Strategy
PEEN	Pan European Ecological Network
RBG	Royal Botanic Gardens
REC	Regional Environmental Centre (for Central and Eastern Europe)
REMIB	La Red Mundial de Informacion sobre Biodiversidad
RINCIS	Rationalisation of Nature Conservation Information Systems (this project)
ROD	Reporting Obligations Database (EEA)
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SBI	Sofia Biodiversity Initiative
SBSTTA	Subsidiary Body for Technical and Technological Advice (of the CBD)
SCOPE	Scientific Committee on Problems in the Environment (of ICSU)
SEDAC	Socio-Economic Data and Applications Center
SIDA	Swedish International Development Agency
SIS	Species Information System (IUCN)
SNH	Scottish Natural Heritage
SoE	State of the Environment
SPA	Special Protection Areas
SPAW	Specially Protected Areas and Wildlife (of the Wider Caribbean Region)
SPREP	South Pacific Regional Environment Programme (UNEP)
SQL	Structured Query Language

SSC	Species Survival Commission (IUCN)
STAP	Scientific and Technical Advisory Panel (to GEF)
TDWG	Taxonomic Databases Working Group
TEMS	Terrestrial Ecosystem Monitoring Sites (Database of GTOS)
TreeBASE	Database of phylogenetic knowledge held at Univ of Buffalo.
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP.Net	Short Name for UNEP information dissemination network
UNEP-DEWA	UNEP Division of Early Warning and Assessment
UNEP-GEMS	UNEP Global Environment Monitoring System
UNEP-GRID	UNEP Global Resource Information Database
UNEP-ROE	UNEP Regional Office for Europe
UNEP-WCMC	UNEP World Conservation Monitoring Centre
UNESCO	United Nations Education, Scientific and Cultural Organization
UNESCO-MAB	UNESCO Man and the Biosphere programme
UNESCO-WHC	UNESCO World Heritage Centre
UNU	United Nations University
US-AID	United States Agency for International Development
US-LTER	United States Long Term Ecological Research
UTM	Universal Transverse Mercator (map projection)
UVA	Universiteit van Amsterdam
WCPA	World Commission on Protected Areas (IUCN)
WDPA	World Database on Protected Areas
WebCDS	Catalogue of Data Sources on the Web
WHC	World Heritage Centre (UNESCO)
WHO	World Health Organization
WMO	World Meteorological Organization
WRI	World Resources Institute
WWF	World Wide Fund for Nature

EXECUTIVE SUMMARY

Background

In June 2001 DEFRA asked UNEP World Conservation Monitoring Centre and the Orbis Institute to jointly carry out Research Project CR0252 "*Rationalisation of Nature Conservation Information Systems*". The project arose over concerns within DEFRA that the proliferation of information services and networks purporting to consolidate or integrate the dissemination of nature conservation information was confusing, inefficient and unnecessarily expensive. The introduction of new institutions such as the Global Biodiversity Information Facility raised the question of how to resolve conflicting demands for support of programmes and activities within the finite resources available.

Aims and objectives

The overall objective of this project was to contribute to improving Government policy development and implementation in nature conservation, both domestically and internationally (globally and within Europe), thus allowing better policy decisions to be taken with a more integrated perspective.

More specifically, the project aimed to:

- compile information on international information networks and services that deliver information relevant to nature conservation and biodiversity
- critically assess the information holdings and analysis capacities of such agencies in the context of the needs of policy-making bodies of the UK Government
- provide guidance on the most effective and efficient use of existing information sources for policy development
- provide recommendations on approaches that may be taken for increasing synergies in the delivery of information
- evaluate and make recommendations on the information organisations and networks that most merit future support and investment in the context of UK Government needs.

Outputs

There are three principal outputs of the project:

- an ***assessment of the needs*** of UK policy-making bodies for biodiversity information, which was delivered 4 October 2001 through the report *"Assessment of Requirements of UK Policy-Makers for International Conservation Information"*
- a ***Reference Guide*** to international nature conservation information sources and networks, which has been developed as an online query system available through the Internet
- a ***final report*** containing a series of strategic and tactical ***recommendations*** on how to rationalise the information sources and identify those most worthy of support and investment.

Approach

The project was conducted between June 2001 and August 2002 and consisted of five phases:

1. *Planning, fact-finding and preliminary analysis*
2. *Needs analysis of UK Government policy-makers*
3. *Information gathering and in-depth analysis of relevant international nature conservation information systems*
4. *Assessment and development of recommendations on approaches to rationalisation*
5. *Preparation and presentation of the Reference Guide and reports.*

A critical early activity was a series of interactive **workshops** with key users of international information sources and networks within Government departments, devolved administrations, statutory nature conservation bodies and other relevant organisations. The workshops provided an overview of the most relevant information networks, established how these sources were currently being used in developing and implementing national policy and responding to international obligations, and identified user views on gaps and deficiencies. Five workshops were convened, two in London and one each in Bristol, Edinburgh and Peterborough.

At the start of the project it was difficult to anticipate both the number of information sources that would require review, and user needs and expectations of the proposed *Reference Guide*. For this reason it was agreed that the workplan and approach would be reviewed and refined at the end of Phase 2, incorporating the experiences of the workshops. The principal adjustments following input from the workshops were:

- *Scope:* The project should primarily focus on nature conservation or "green" issues such as species conservation, protected areas, habitat conservation and rehabilitation, and the measures necessary to implement conservation policies.
- *International emphasis:* Primary focus should also be on addressing the obligations imposed by the biodiversity-related MEAs and in particular the relevant EC measures (both directives and regulations).
- *Delivery mechanism for the Reference Guide:* A change of emphasis was made from a published Reference Guide, to an online information service, capable of spin-off products and continued maintenance.
- *Scope and emphasis of recommendations:* The focus of the recommendations should be on the rationalisation of initiatives and programmes for *inter alia*:
    - implementing European policies and directives
    - accessing case studies and best practices
    - reducing and/or streamlining reporting processes
    - improving access to experts
    - improving early warning of emerging issues.

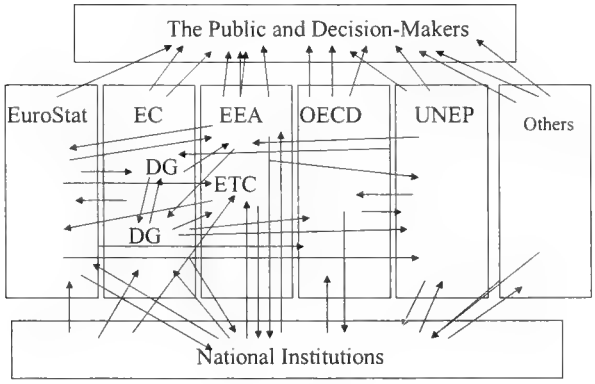
Further, it was clear that DEFRA was seeking **strategic level** direction in the recommendations - suggesting the modalities for the UK government to influence the many international initiatives in harmonization to improve effectiveness for policy-making purposes and to reduce duplication and overlap.

Current situation

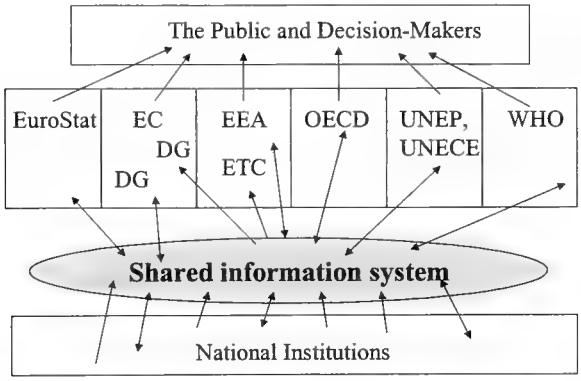
The concern to harmonize and integrate environmental information in ways that facilitate nature conservation policy-making is not new. The need was identified during the Stockholm Conference of 1972 and reflected in early programmes of UNEP. In the decades since, there has been considerable activity aimed at improving the situation, and there is a wide range of initiatives in harmonization, streamlining and integration. Some significant progress has been made, but the very proliferation of harmonization efforts is now almost as much a concern as the diversity of information sources in the first place.

The following diagrams[1] illustrate the current situation as seen by the European Environment Agency (EEA). There are major concerns in Europe about multiple and inefficient reporting of data, a lack of transparency, and data sharing that is not optimised.

[1] Both diagrams courtesy of David Stanners, EEA



The second diagram illustrates the more desirable situation that EEA harmonization efforts are seeking to achieve.



Achieving this concept of a pan-European or global "shared information system" is the intended goal of many current harmonization efforts in various sectors and for different information sub-sets. However, many of the major issues of a decade ago remain, particularly the need for:

- tools that can integrate information from different sources
- effective time-series to identify trends
- information appropriate for policy-making
- tools to identify and select the correct information from the masses available.

This leads to four primary themes or directions that harmonization efforts should be emphasising:

- *Integration:* This covers two issues, integration across sectors (thus integrating "sustainable development" and natural resource utilisation with "conservation"), and integration of information from multiple sources (which demands harmonization tools for compatibility and rationalisation to reduce redundant effort).
- *Assessment of effectiveness of measures:* To close the policy feedback loop it is necessary to be able to measure the effectiveness of instruments and policies implemented, and actions taken. Currently in nature conservation, particularly with regard to MEAs, information gathered emphasises compliance with articles, but provides little insight into on whether the actions taken are effective in meeting MEA objectives.

- *Early warning*: It is essential to have information on trends and directions of conservation status, of the factors adversely affecting biodiversity, and of public and political opinion, in order to engage in an informed policy development process that has sufficient warning to correctly research and implement effective instruments and actions.
- *Metadata availability:* There is a need for the systematic collection and maintenance of improved metadata about the information available, and for effective search tools, in order to locate and select information useful for policy purposes.

Information sources and services

One of the project aims was to identify, critically assess, and catalogue the key international information sources of potential value to UK policy-makers. This catalogue has been assembled in the form of an online Reference Guide to aid policy-makers in finding relevant information.

In total, 187 significant information sources were identified and described in structured "profiles". These profiles have been entered into a database to assist with analysis and to support the online Reference Guide. The major elements described for each source were:

- name of the source or service
- summary of information content
- objectives and intended audience
- access issues (restrictions, cost etc)
- contact information
- summary of plans and future directions.

To facilitate selection and retrieval, the information content was categorised by keywords and other descriptive terms. These were selected based on feedback from the workshops as follows:

- keywords from the GEMET thesaurus
- open keywords
- types of information service
- types of information
- environmental theme or issue
- geographic scope.

Based on these data elements, the Reference Guide can be searched by any combination of:

- name of source or service (or part thereof)
- type of information service
- environmental theme
- cluster (see below)
- information types available
- controlled keywords (from GEMET)
- open keywords
- geographic scope.

In addition to the search capability, another facility allows for the printing or downloading of a profile or selected group of profiles, so that a customised up-to-date desk reference can be made at any time.

The online Reference Guide can be accessed through the project website at:
http://www.unep-wcmc.org/conventions/RINCIS

Improving existing sources and services

In the two decades since the International Forum on Environmental Information noted the deficiencies in information sources for policy-making, a vast number of new information sources and services have been developed and the technology for effective search, linkage, and usage of such sources has improved dramatically.

Many of the information sources identified in the course of the project are networks that provide access to thousands of sectoral and specialised sources. Although there are some gaps (for example, co-ordinated access to information on case studies and best practices), lack of information is not the primary problem. The question is how to improve these existing sources, particularly for use in nature conservation policy-making.

Some of the main improvement issues are the need for:

- improved facilities for locating information resources (metadata and search tools)
- increased consistency in availability across sites (e.g. Convention secretariats vary greatly as to type and extent of information provided)
- improved quality management (few services currently have published quality standards or procedures)
- consistent long-term management of datasets (many are irregularly funded and managed, leading to gaps and quality issues)
- discouraging inflated claims (many sources claim to be "definitive" or "complete" diverting attention and resources from potentially better sources).

Analysis of information sources and harmonization initiatives

The services identified and reviewed range enormously in purpose, intent, scope and subject matter. To be able to effectively analyse and discuss the services, and the related harmonization and integration initiatives, it was found necessary to group them by similar intent and audience. We refer to these groupings as *clusters,* and services within a cluster could be subject to scrutiny for levels of duplication and complimentarity. Ten such clusters were identified and are shown in the table below (noting that any one service may be classified into several clusters).

In the course of this project, 66 programmes, projects and institutions attempting to harmonize integrate or rationalise nature conservation information were also identified. Not all of these are currently active, but all have been at some time during the last two years. Significant initiatives occur in almost all of the 10 main clusters. The following table shows the numbers of profiles (information sources) and harmonization initiatives broken down by cluster.

Cluster	Profiles	Harmonization Initiatives
1 - Convention and Treaty Information Sources	21	17
2 - Information on Sites	27	5
3 - Development projects and donor information	18	3
4 – Clearing-House Mechanisms & Integrated Exchange Networks	29	4
5 - Environmental Law	14	1
6 - Global and Regional Long Term Ecological Monitoring	24	5
7 - Taxonomic Information	55	12
8 - Species Status Information	34	7
9 - Policy and Strategy Information	38	0
10 - European Nature Conservation Information	29	12

Clearly there is a relatively large amount of activity surrounding harmonization of conventions, species information and taxonomy, but it is difficult to present an across-the-board summary.

A cluster-by cluster analysis was conducted and in each the issues and current harmonization activities are discussed. In general the approach was to, identify the **players** in the area, consider the main **issues and concerns,** describe the main **harmonization initiatives** currently addressing these concerns, and finally to discuss and present **recommendations**. The recommendations within each cluster are divided into "strategic" - those that indicate general directions, and "practical" - those that provide potential specific implementation alternatives to address the strategic recommendations.

In some clusters the situation with respect to harmonization initiatives is straightforward with only one dominant programme, while other clusters have two or more potentially competing or overlapping programmes. Some clusters have very complex situations, such as in the European cluster and are elaborated more fully. Details of these analyses can be found in Chapter 7 of the Report.

Achieving harmonization and rationalisation

Barriers

The relative lack of progress in achieving harmonization and rationalisation in the last decade indicates that it is a difficult process, with genuine barriers over and above individual intransigence or competitiveness of institutions. Some of the principal barriers are:

- Lack of an overall vision for nature conservation information management, or even an understanding of what can be done
- Genuine scientific uncertainly or debate (beyond minor individual differences) that makes true standards difficult to achieve
- Differing constituencies of the institutions involved, and hence differing purposes and directions for information collection and management
- The slow pace of official decision-making - for instance in the MEAs where there may be several years between meetings of official governing bodies
- Inadequate funding for information management and for long-term monitoring, exacerbated by apparent (and real) duplication of effort and competition between agencies
- Fragmented and insufficiently coordinated responsibility for national biodiversity information management
- Lack of harmonization tools, for instance to align ecological classification systems, equate terminology
- Instinctive institutional resistance to "rationalisation" - even to efficiency measures such as co-location, shared secretariats, shared information technology and information custodians.

The net effect of these barriers is that institutions are often in favour **in principle** of harmonization, but unwilling or unable to participate if it costs any time or money. Furthermore, institutions or programmes set up explicitly to integrate, harmonize or exchange information have great difficulty in securing assured base funding.

Overcoming the barriers will require:

- clear understanding of the purpose and benefits at all levels
- interagency co-operation
- multi-national co-operation
- information and experience sharing
- wide consultation with stakeholders
- progressive and incremental steps through pilot projects that solve practical problems
- adoption of tested procedures for wider implementation
- pragmatic decisions on institutional rationalisation and support for programmes.

Methods and levers to influence rationalisation

The UK Government, like all nation states, does not have the authority to change or rationalise institutions or programmes beyond its national competence. It does, however, possess a number of means to influence the direction of events and to encourage and support more rational and harmonized approaches. Some of these methods and levers are:

- UK participation in the formal governance bodies of international agreements, international organizations and other organizations operating internationally
- The various UK roles within the European Union and European Community, and the influence the UK brings to bear on the European Commission and its agencies
- UK participation in the numerous committees and working groups that provide scientific, technical and other advice to governance processes at the European level and wider
- Funding that the UK provides in project support.

Recommendations

There are approximately one hundred recommendations in the report. All are collected together in Annex V to the Report, which makes an excellent companion to this Executive Summary. Four types of recommendation have been derived from this research project.

- *General strategic recommendations:* which identify the main themes and directions for improved rationalisation (these are listed below)
- *Cluster-specific strategic recommendations:* which identify the main themes and directions for improved rationalisation within each cluster (see Annex V)
- *Cluster-specific practical recommendations:* which recommend implementable actions or activities within each cluster (see Annex V)
- *Cross-cutting recommendations:* practical recommendations that bridge cluster boundaries on several more generic issues (see Annex V).

The general strategic recommendations provide directions for improving the use of international information sources in developing UK policy on nature conservation, and on how to obtain maximum benefit from support to, and influence on, the rationalisation of these sources. To do this it is useful to have a general vision or model of what we are trying to achieve.

The guiding concept used, based closely on thinking within the EEA, is an information system supporting a policy process that considers nature conservation in a broad sustainable development framework, linked to monitoring based on measurable targets. This provides for policy implementation that can show accountability to MEAs as well as public expectations.

In summary the recommended strategic directions are:

- *Identify overall goals and directions*
- *Integration to permit policy compromises*
- *Measure policy performance against indicators*
- *Develop a shared (and shareable) information base.*

With this as a basic framework the following are the general strategic recommendations:

Strategic recommendation 1: Identify national strategic directions and goals for nature conservation and as a consequence define the needs and priorities for information.

Strategic recommendation 2: Review and discuss these needs widely within those agencies responsible for policy development and implementation, in order to ensure an integrated and co-ordinated approach to use of international information sources and services.

Strategic recommendation 3: Support the development of information networks and reporting mechanisms that allow for the assessment of the effects of instruments such as MEAs and of national and international actions towards the desired goals.

Strategic recommendation 4: Develop mechanisms for closer liaison between the various departments and sectors within the UK government structure in order to improve the capacity to assess the overall impact of policies on nature conservation and improve overall cross-cutting communication.

Strategic recommendation 5: Ensure effective use of international information sources and services in development and implementation of nature conservation policy in the UK through the wide availability of metadata tools such as the RINCIS online Reference Guide, and improved knowledge of other information networks such as EIONET and Clearing-House Mechanisms.

Strategic recommendation 6: In supporting projects and programmes in information access and policy development, focus on the major players most relevant to the UK and UK policy, such as the EEA (and ETCs), UNEP, OECD, and those directly concerned with national implementation of international agreements.

Strategic recommendation 7: Support international initiatives that are leading to harmonization of information sources and services, including through the implementation of pilot and demonstration projects within the UK.

Strategic recommendation 8: Take steps to support improvements in existing information sources and services where they are not currently adequate to UK needs and purposes.

Strategic recommendation 9: Promote development of further international information sources and services, where there are significant gaps, especially those that can provide credible information on global and regional trends, and that can serve multiple policy purposes.

Strategic recommendation 10: Support measures and information services that assist:
- ***Implementing European policies, Directives and other obligations***
- ***Accessing case studies and best practices***
- ***Reducing/streamlining reporting processes***
- ***Improving access to experts***
- ***Improving early warning of emerging issues.***

As noted above, the Report contains cluster-specific and cross-cutting recommendations that provide more focussed suggestions on approaches to be taken in implementing these strategic directions. They include practical actions, identifying where the UK Government might provide support to help ensure the increased availability and accessibility of information for national policy development and implementation.

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1 INTRODUCTION

1.1 BACKGROUND

This project arose over concerns within DEFRA that the proliferation of information services and networks purporting to consolidate or integrate the dissemination of nature conservation information was confusing, inefficient and unnecessarily expensive. The introduction of new institutions such as the Global Biodiversity Information Facility with assessable membership dues raised the question of how to resolve conflicting demands for support of programmes and activities within finite resources.

The overall objective of this contract was to contribute to improving Government policy development in nature conservation, both domestically and internationally (globally and within Europe), thus allowing better policy decisions to be taken with a more integrated perspective.

More specifically, the project aimed to:

- compile information on international information networks and services that deliver information relevant to nature conservation and biodiversity
- critically assess the information holdings and analysis capacities of such agencies in the context of the needs of policy making bodies of the UK Government
- provide guidance on the most effective and efficient use of existing information sources for policy development
- provide recommendations on approaches that may be taken for increasing synergies in the delivery of information
- evaluate and make recommendations on the information organisations and networks that most merit future support and investment in the context of UK Government needs

There are three principal outputs of the project:

- an ***Assessment of the Needs*** of UK policy-making bodies for biodiversity information
- a ***Reference Guide*** to international nature conservation information sources and networks
- a series of ***Recommendations*** on how to rationalise the information sources and identify those most worthy of support and investment

The needs assessment was delivered on October 4, 2001 by the report "Assessment of Requirements of UK Policy-Makers for International Conservation Information".

The Reference Guide has been developed as an online query system available through the Internet.

This Final Report contains both strategic and tactical recommendations on rationalising nature conservation information services.

1.2 APPROACH

The project was organised in a series of logically connected steps, grouped into five major Phases as follows:

1. *Planning, fact-finding and preliminary analysis*
2. *Needs analysis of UK Government policy-makers*
3. *Information gathering and in-depth analysis of relevant international nature conservation information systems*
4. *Assessment and development of recommendations on approaches to rationalisation*
5. *Preparation and presentation of the Reference Guide and reports.*

The project began 1 June 2001 with a target completion date of 30 May 2002. The first two Phases concentrated on identifying and confirming information needs and uses, the second two on assembling detailed information and assessing the strengths and weaknesses of international

information sources (compiling the Reference Guide), and the final Phase analysed the findings and developed the recommendations.

A critical early activity was to conduct a series of interactive **Workshops** with key users of international information sources and networks within Government Departments, devolved administrations, statutory nature conservation bodies and other relevant organisations. The Workshops provided an overview of the most relevant information networks, and at the same time established how these sources are currently used in developing and implementing national policy and responding to international obligations, and user views on gaps and deficiencies. Five Workshops were convened, 2 in London and 1 each in Bristol, Edinburgh and Peterborough. There were a total of 31 participants from 20 organisations.

A Progress Report summarising the results of Phases 1 and 2 included the Assessment of Requirements Report, summaries of each of the Workshops, and participant lists.

At the beginning of the project it was difficult to anticipate the number of information sources and networks that would require analysis, and the user needs and expectations of access modes for a Reference Guide. For this reason it was agreed that the workplan and approach would be reviewed and refined following the end of Phase 2, following the experiences of the Workshops. Subsequent to this review a revised workplan was prepared and approved for Phases 3-5 of the Project. The principal adjustments to the approach are noted in the following:

Scope: The content and programme scope should primarily focus on nature conservation or "green issues", such as species conservation, protected areas, habitat conservation and rehabilitation, and the measures necessary to implement conservation policies including the obligations imposed by MEAs and EC directives. Other environmental issues, such as climate change, pollution (i.e. "brown issues"), cultural landscape conservation and natural resource management are relevant only to the extent that they may impinge on conservation.

This meant reduced emphasis on environmental statistics (on pollution sources, resource utilisation etc) and state-of-the-environment (SoE) monitoring, resource harvesting (forestry, agriculture, fisheries) and on cultural heritage. One consequence was to indicate that the expertise of GRID-Arendal (in SoE and environmental monitoring statistics) was not essential and they were dropped from the project.

International Emphasis: It became clear from the workshops that UK policy is most heavily driven by European factors, particularly EC Directives. International drivers, including the international conventions are important, but of less pressing concern. As a result increased emphasis was placed on information needs for the implementation of EC measures.

Delivery Mechanism for the Reference Guide: There was a strong message that the "Reference Guide" should be a live, continuously up-dated service, rather than a hand-book or searchable CD-ROM, and should provide value to policy and decision-making on an on-going basis. The consequence was a change of emphasis from a Reference Guide "book" with CD-ROM version, to a live information service, capable of spin-off products and continued maintenance. Therefore the project needed more IT (Web and database) expertise, and additional specific steps in the Programme of Work to allow for design and implementation of a pilot Reference Guide Information Service. Recommendations on costs and options for on-going operation and maintenance of such a service were also required.

Scope and Emphasis of Recommendations: Based on the Workshop and consultations with DEFRA the focus should be on recommendations relating to the rationalisation of international and national initiatives and programmes for:

- Implementing European policies and Directives
- Accessing case studies and best practices
- Reducing/streamlining reporting processes

- Improving access to experts
- Improving early warning of emerging issues.

Further, it was clear that DEFRA was seeking **strategic level** direction in the recommendations. The recommendations should suggest modalities for the UK government to best influence the many international initiatives in harmonization to improve effectiveness for policy-making purposes and to reduce duplication and overlap.

These changes required a short extension of the target completion date to June 30, 2002, later revised to July 31, 2002 at the request of the contractor.

1.3 IMPLEMENTATION

The successful bidder on the research project was a partnership between the UNEP World Conservation Monitoring Centre (Cambridge, UK) and The Orbis Institute (Ottawa, Canada). The Project Manager was Dr. Ian Crain a Principal of the Orbis Institute. The project director for UNEP-WCMC was Jeremy Harrison.

Supporting experts on the project team included Mary Cordiner, Phill Fox, Martin Jenkins, Tim Johnson, Gwynneth Martin, Anne Menthon, James O'Carroll, Karen Simpson, and Alistair Taylor.

1.4 ACKNOWLEDGEMENTS

The project team would like to express appreciation to all the officials of national and international agencies who provided information on their current and planned programmes and considerable time in discussion. Particular thanks in this regard goes to Peter Bridgewater and Salvatore Arico of UNESCO-MAB, David Stanners and Ulla Pinborg of EEA, Lawrence Way and Paul Rose of JNCC, Dominique Richard of ETC/NPB, Marcus Silva of CBD, Natarajan Ishwaren and Mechtild Rossler of UNESCO-WHC, and Alistair Gammell of RSPB.

Apart from the immediate RINCIS project team, a number of the staff and associates of UNEP-WCMC provided advice, knowledge and expertise, including *inter alia*, Neville Ash, John Caldwell, Stuart Chape, Brian Groombridge, Stefan Hain, Val Kapos, and Gemma Smith. Jeanette Havinga and Lise Jackson were particularly helpful in tracking project accounting.

The project leadership and useful feedback from Richard Hepburn and subsequently Steve Lee-Bapty of DEFRA was much appreciated, as was time spent by many DEFRA and JNCC officers. The help of Vickie Whitehead of DEFRA in organising the Workshops, seminars and administrative matters was invaluable.

The advice and input of all those who contributed was invaluable in compiling this report, however it should be noted that the report may not necessarily reflect the opinions of any one contributor.

2 NATURE CONSERVATION INFORMATION NEEDS OF UK POLICY-MAKERS

Nature conservation information (and hence information sources and services) are used in policy making by a range of UK government departments agencies and evolved authorities. The nature of these uses and needs were assessed through a series of interactive Workshops conducted early in the project. Full details are provided in the report *Assessment of Requirements of UK Policy-Makers for International Conservation Information* of October 4, 2001.

The objectives of the Workshops were:

- To provide participants with an insight into the principal sources of nature conservation information currently available, their strengths, weaknesses and future directions
- To learn from participants what information sources are currently being used, how the information is used in policy development and decision making, and what barriers and gaps are perceived.

Six primary **uses** of international information sources and networks were identified:

- Informing the UK position on international policy issues
- Implementation of international obligations in response to MEAs
- Meeting international reporting requirements
- Implementing enforcement measures
- Assessing emerging issues, status comparison
- International comparisons for setting national priorities.

The primary groups of information **sources** identified are:

- The Convention secretariats
- International NGO networks and repositories
- Species status reference sources
- Taxonomic reference sources
- Information collections related to "sites".
- General Policy and programme implementation sources
- European sources

A number of issues and problems were identified that limited the effective use of international data sources and networks. The most significant can be classified as:

Gaps and overlaps - Some key gaps identified were:

- Information on sustainable use and markets for biodiversity
- Information on national implementing legislation, strategies and measures in other countries
- Case studies, good practices and "lessons-learned" in countries with comparable situations
- Early warning of emerging issues and policy developments, especially in the EU.

Quality and reliability, appropriateness for policy - In spite of targeted programmes of harmonization and integration over a number of years, there continues to be a gap between scientific observation and the need for integrated predictive cause-and-effect information needed by national decision-makers.

Need for harmonization and integration - A major concern of policy-makers is the need for information to be comparable and compatible – i.e. capable of being integrated and summarised. This raises a number of issues regarding the requirements of stakeholders for increased harmonization to enable useful interpretation in a policy context, with implications not only for harmonization of the information *per se*, but also for methods and means of information management and analysis.

The need for improved harmonization and "interoperability" on a number of fronts is well recognised. Many initiatives to improve harmonization and integration of nature conservation information and the

operations of the related MEAs have been identified. A number of concerns were raised about these initiatives, including:

- Is there sufficient collaboration between these efforts?
- Which initiatives are really suitable for enhancing policy-making as opposed to science or the administration of treaties?
- Are the right things being harmonized? For example are there steps to enable the assessment of the effectiveness of MEAs in terms of environmental improvement rather than counting activities?
- Is there too much emphasis on achieving standardisation and complete scientifically correct answers, rather than pragmatic interoperability – for example with taxonomies?
- Is there sufficient attention to harmonization of classification systems and terminology and other standards required to make data and information compatible?
- What is the value and purpose of multi-designated protected areas, and how can approaches and information management be better harmonized?

Policy-makers sought insight and resolution of confusion in the following groups of initiatives:

- Taxonomy and species status information
- Global treaty harmonization and synergy programmes
- Harmonization and integration of site related information
- Global information networks
- Enabling and supporting harmonization efforts
- Harmonization of reporting.

3 CURRENT SITUATION

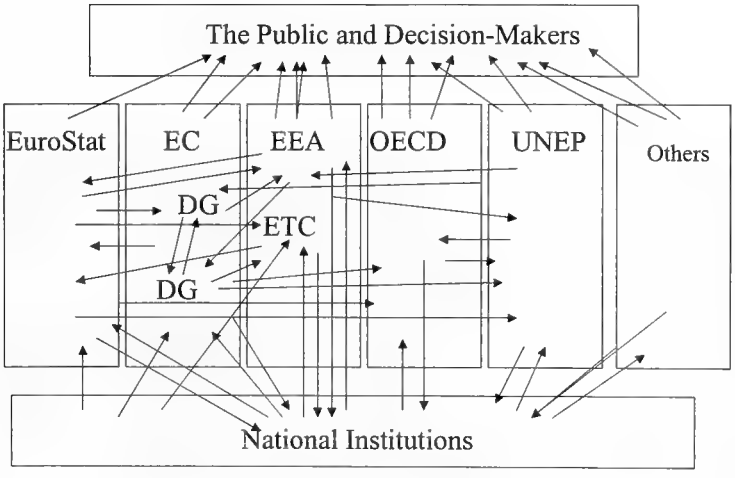
3.1 OVERVIEW

The concern to harmonize and integrate environmental information in ways that facilitate nature conservation policy-making is not new. The Stockholm Conference of 1972 that led to the creation of UNEP generated the concept of "Earthwatch", leading to the UNEP Global Environmental Monitoring System (GEMS). A pre-Rio meeting in Montreal in 1991, the International Forum on Environmental Information, was devoted to the topic and noted in a principal discussion paper:

> *"The use of available information for policy decision-making is hampered by:*
> - *lack of consistency, standardisation and harmonization of information and collection methods*
> - *time-series, when available, are often short and irregular*
> - *no comprehensive inventory of environmental information exists*
> - *inappropriate summarisation frameworks (largely on a national basis)*
> - *insufficient abstraction and insufficient availability of universally agreed indicators"*

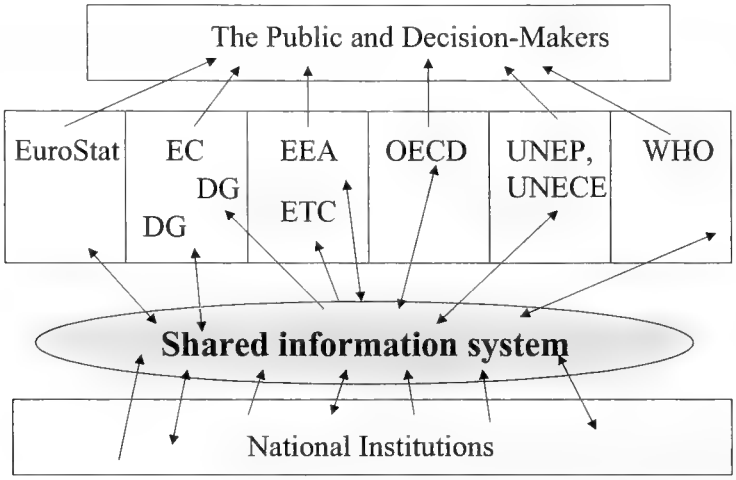
In the decades since, there has been considerable activity aimed at improving the situation, especially in the context of the Rio Conventions. There have been in the past (such as the short-lived UNEP Office of Harmonization of Environmental Measurement), and there are currently active, a large number of initiatives in harmonization, streamlining and integration aimed at "bridging the gap" to make environmental information useful and relevant for national and regional purposes. Some progress has been made, but the very proliferation of harmonization efforts is now almost as much a concern as the diversity of information sources in the first place.

The following diagram [2] illustrates the current situation as seen by the European Environment Agency (EEA) where there are major issues observed in Europe of multiple and inefficient reporting of data, a lack of transparency and data sharing that is not optimised:



[2] Both diagrams courtesy of David Stanners, EEA

The following diagram illustrates the more desirable situation that harmonization efforts are seeking to achieve.



Achieving this concept of a pan-European or global "shared information system" is the intended goal of many current harmonization efforts (for various sectors and information sub-sets).

Many of the major issues of a decade ago remain, particularly:

- The need to develop harmonization tools that make possible the integration of information from different sources compatible and useable for policy making
- The need for effective time-series to identify trends
- The appropriateness of the information for policy making
- The ability to identify and select the correct information from the masses available

This leads to four primary themes or directions that harmonization efforts should be emphasising:

- ***Integration***

There are two aspects to this:

- Integration across sectors, that is, looking at policy making on a broad basis, thus integrating "sustainable development" natural resource utilisation with "conservation", rather than seeing these as separate sectors. Similarly incorporating conservation status into state of the environment reporting and related indicators
- Integration of information from multiple sources, which demands harmonization tools for compatibility and rationalisation to reduce redundant effort.

- ***Assessment of effectiveness of measures***

To close the policy feedback loop it is necessary to be able to measure the effectiveness of instruments and policies implemented, and actions taken. Currently in nature conservation, particularly with regard to MEAs, information gathered emphasises compliance with articles but provides little information on whether the actions taken are effective in meeting MEA objectives. (For instance, is the Convention on Biological Diversity (CBD) slowing the rate of loss of biodiversity or improving the equitable sharing of benefits?)

- ***Early warning***

It is essential to have information on trends and directions of conservation status, of the factors adversely affecting biodiversity, and of public and political opinion in order to engage in an informed policy development process that has sufficient warning to correctly research and implement the effective instruments and actions.

- ***Metadata availability***

There is a need both for improved and systematic metadata, and for effective search tools (e.g. incorporating environmental thesauri) in order to locate and select information useful for policy purposes.

These themes are reflected in current thinking of the EEA and are similar to directions of UNEP and the UN Commission on Sustainable Development. They can be thought of as a conceptual model for global integration as well as for national systems.

The current global situation is far from ideal - there are too many information sources and networks, with overlapping goals and incompatible information. The following sections provide more detailed information on the range of sources and services available and on current harmonization and rationalisation initiatives.

3.2 INFORMATION SOURCES AND SERVICES

3.2.1 Scope and Organisation

In the course of this project a large number of international information sources and services have been identified as relevant to UK policy-making in nature conservation, and described in detail. This was however only a sub-set of the thousands of such services that exist world-wide.

The scope was circumscribed by a number of factors agreed upon through discussion with DEFRA at early stages of the project.

Firstly, the subject matter "nature conservation", although considered rather broadly, was not considered to extend to "brown issues" such as air and water pollution, production statistics or human health, nor to the industrial or resource sectors, such as forestry fisheries, agriculture, mining and so on - except where clearly directly connected to conservation issues.

Secondly, sources and networks were included only if international - that is not specific to one country (including the UK) - and relevant to the UK. Therefore some regional networks have not been included even though international - for instance those dealing with North America or small sub--regions of little relevance to UK policy.

Thirdly, relevance to policy in general was considered, so that low priority was given to sources that exist primarily to serve researchers and scientists, although taking note that one of the aims of the project was to improve the connections between science and policy.

The survey was of information sources, services and networks, not specifically of "websites" or electronic services. It has, however, turned out that almost all the information sources are accessible via the Internet or at least provide an online access gateway.

Applying these criteria, 187 significant information sources were identified and described in structured "profiles". These profiles have been entered into a database to assist with analysis and retrieval. The major elements described for each source were:

Information Element	Description
Name and short name	Commonly used short name or abbreviation
Information content	An abstract or summary of the information available from this source, with particular reference to policy-relevant information
Purpose	Objectives and intended audience of the information service
Access	Access restrictions (if any), fees and so on
Contact information	Principal point of contact for the responsible organisation, including email and web addresses
Plans and future directions	Descriptive information of current activities or plans to enhance or alter the services, as at approximately September 2000

To facilitate selection and retrieval, the information content was categorised by keywords and other parameters. These were selected based on feedback from the Workshops as follows:

Information Element	Description
GEMET Keywords	A controlled list of keywords selected from the GEMET thesaurus
Open keywords	An open-ended list of additional keywords, mainly to be more specific on species or issues
Category	Controlled list of types of information service
Information types	Controlled list of information types available, such as national reports, case studies, etc
Environmental theme	Controlled list of principal environmental themes or issues that the service may address
Geographic Scope	The scope of the information service in controlled terms using standard UNEP regions and sub-regions)

In addition each profile was classified into one or more "Clusters" of related services (see below).

Of the total number of profiles, approximately 50 were identified as "key information sources". For this sub-set of profiles additional information was added to the database on funding and relevance for policy making. The descriptive comment fields on funding and policy relevance are not available through the online query system, i.e. are intended to be "for DEFRA eyes only".

Details of the database fields and structure can be found in Annex II.

The database can be used to summarise and report the nature and scope of the services that have been profiled. The following shows a summary by Environmental Theme and Information Types Available. Please note that in all cases a service may fall into one or more categories, thus the total will always exceed the actual number of profiles.

Environmental Theme	No of Profiles
Awareness Raising	44
Biosafety	5
Climate Change	16
Conservation Status	13
Convention Harmonization	14
Environmental Law	18
Genetically Modified Organisms	5
Indicators	11
Invasive Species	8
Landscape and Habitat Conservation	66
Monitoring and Assessment	6
National Reporting	11
Protected Areas Management	32
Regional and Global Policy	57
Species Conservation	104
Standards & Classification Systems	49
Sustainable Use	49
Tech. Transfer & Capacity Building	32

Information Types Available	No of Profiles
National Reports	11
Treaty Text	42
Formal Decisions	40
Meeting Minutes/Proceedings	52
Meeting Papers	36
Reporting Requirements & Guideline	18
Policy Papers	80
National Statistics	26

Information Types Available	No of Profiles
Regional Statistics	18
Case Studies	29
Good Practices	13
Standards	16
Species Status	41
Species Checklists	28
Indicators	16
Global Assessments	21
Lists of Parties	33
Roster of Experts	8
Focal Points	49
Site Descriptions & Reports	44
Monographs	45
Databases	115
Metadata	86
News & Events	115
Taxonomy	41

The above summary confirms the opinions of the Workshop participants on the relative dearth of case studies, good practices and rosters of experts.

In terms of category of service, the majority were classified as either online information service or database as shown in the following table.

Category	No of Profiles
Online Information Source	105
Database	81
Document Repository	30
Network/Exchange Mechanism	39
Clearing-House	8
Metadata/Catalogue	16

3.2.2 Clusters

The profiled services range enormously in purpose, intent, scope and subject matter. It is therefore very difficult to perform any assessment or analysis or draw any conclusions across the totality. We found however, that there were groupings of services that were connected by similar intent and audience, and could be subject to scrutiny for levels of duplication and complimentarity. We refer to these groupings as "Clusters" and have identified 10 clusters, each briefly described in the following. Note that one service may be classified into several clusters.

Cluster 1 - Convention and Treaty Information Sources
Information services provided by international treaty secretariats, and those intended to provide integrated information or harmonization across MEAs.

Examples:
Ramsar Convention on Wetlands Website
Joint Website of the Biodiversity Related Conventions
UNEP-WCMC Harmonization of National Reporting Website

Cluster 2 - Information on Sites
Information services that provide information on protected areas, officially designated sites (national and international), site based datasets (especially if long-term) and site conservation and management.

Examples:
Biosphere Reserve Integrated Monitoring Programme (BRIM)

BirdLife International - Important Bird Areas Database
Natura 2000 Network

Cluster 3 - Development projects and donor information
Information services that list or provide the status of nature conservation development projects, or information on international policies and priorities for funding of donor projects (multilateral and bilateral).

Examples:
Global Environment Facility - Project Information
OECD - Development Assistance Committee
UNDP Website

Cluster 4 – Clearing-House Mechanisms and Integrated Exchange Networks
Information services that are identified as "clearing-houses" or serve that sort of purpose, that is, facilitate the exchange of nature conservation information between members of a network, or are broadly open to all.

Examples:
CBD Clearing-House Mechanism
Biodiversity Conservation Information System (BCIS)
Inter-American Biodiversity Information Network (IABIN)

Cluster 5 - Environmental Law
Information services that provide access to or reference to international and national environmental law, especially related to MEAs, EC legislation and related national implementing laws. Also included are services that provide policy analysis, commentary, advice and capacity building in international environmental law.

Examples:
ECOLEX
IUCN - Environmental Law Information Service (ELIS)
Foundation for International Environmental Law and Development (FIELD)

Cluster 6 - Global and Regional Long Term Ecological Monitoring
Information sources that provide databases and data-sets on long-term ecological monitoring, networks intended to assist, and related information on policies, standards and protocols.

Examples:
Biosphere Reserves Integrated Monitoring Programme (BRIM)
GTOS - Terrestrial Ecosystem Monitoring Sites Database (TEMS)
International Long-term Ecological Research Network (ILTER)

Cluster 7 - Taxonomic Information
Information services that provide broadly-based taxonomic reference information, or deal with standards, information exchange and capacity building in taxonomy. (Excluded are very narrow services dealing with only one class or a few species - relevance to policy is a necessary condition for inclusion.)

Examples:
Species 2000
Global Biodiversity Information Facility (GBIF)
All Species Inventory

Cluster 8 - Species Status Information
Information sources that provide information on the conservation status of species, species populations, distribution, threats, and related ecology. Included in this cluster are also species "checklists".

Examples:
CITES Listed Species Database
IUCN-Species Information System (SIS)
UNEP-WCMC Threatened Plants Database

Cluster 9 - Policy and Strategy Information
Information services that provide analysis and views on conservation policy, including the policy sources of UN and intergovernmental organisations, as well as policy "think tanks" and major NGOs.

Examples:
European Centre for Nature Conservation (ECNC)
United Nations Commission on Sustainable Development
World Resources Institute website

Cluster 10 European Nature Conservation Information
This cluster is cross-cutting to the others and was assembled because of the particular emphasis on European policy drivers expressed in the earlier Needs Assessment and Workshops. Included are all information services that deal with nature conservation in a European context, whether strictly EU or pan-European. All entries will of course also be classified into one of the more thematic clusters.

Examples:
European Environment Information and Observation Network (EIONET)
European Topic Centre on Nature Protection and Biodiversity Website (ETC/NPB)
Pan-European Ecological and Landscape Diversity Strategy Guide (PEBLDS)

In summary, the identified information sources and services were classified into clusters as follows (one profile may fall into several clusters):

Cluster	No of Profiles in Reference Guide
Cluster 1 - Convention and Treaty Information Sources	21
Cluster 2 - Information on Sites	27
Cluster 3 - Development projects and donor information	18
Cluster 4 – Clearing-House Mechanisms & Integrated Exchange Networks	29
Cluster 5 - Environmental Law	14
Cluster 6 - Global and Regional Long Term Ecological Monitoring	24
Cluster 7 - Taxonomic Information	55
Cluster 8 - Species Status Information	34
Cluster 9 - Policy and Strategy Information	38
Cluster 10 European Nature Conservation Information	29

3.3 REFERENCE GUIDE

One of the principal outputs of the project was to be a Reference Guide containing annotated profiles of information sources and networks. The purpose of the Reference Guide is to assist policy-makers and their staff

- in identifying and accessing potential resources and networks
- in assessing the relative value and relevance of potential sources.

The Reference Guide therefore provides a summary of the content of the information source, particularly those portions that are relevant to policy-making, and other information on the objectives and geographic scope.

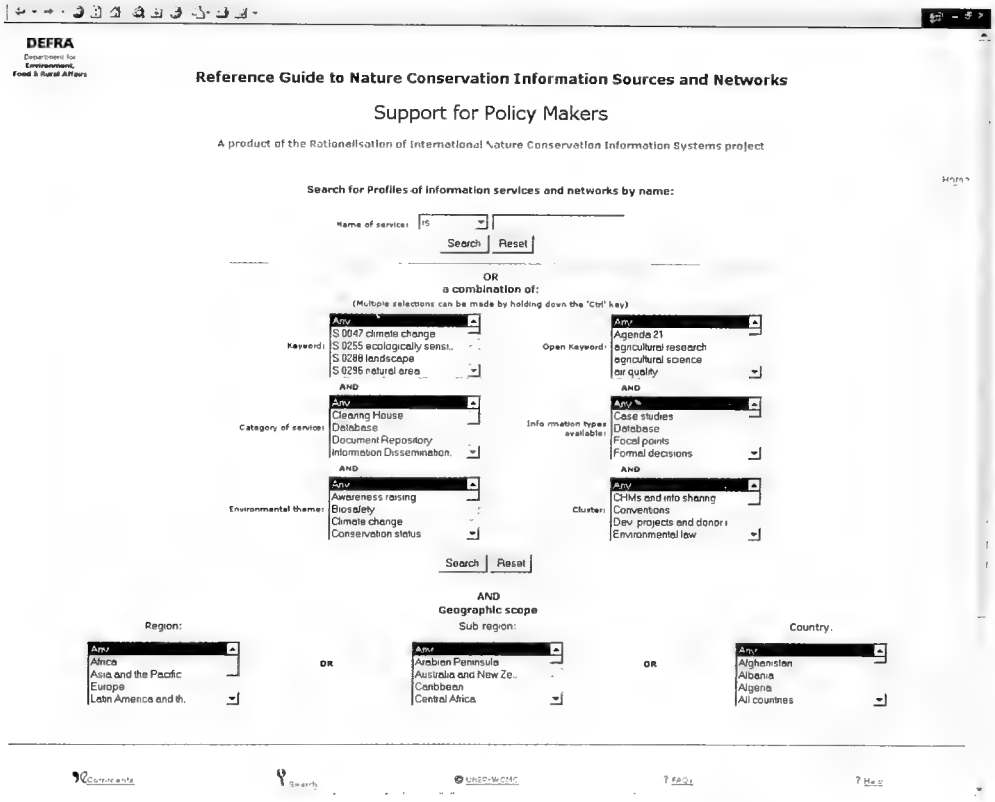
The Reference guide was originally planned as a desk reference handbook. The feedback from the Workshops and mid-project review recognised that such a handbook would rapidly be out-of-date and indicated strongly that it must be a live continuously updated instrument. The *Reference Guide to Nature Conservation Information Sources and Networks* was then re-conceived as an online query service available through the Internet. This allows the searching and selection of profiles based on

keywords, geographic scope, and a range of other criteria based on the needs identified in the Workshops. Another facility allows for the printing (or downloading to a file) of a selected group of profiles, thus a customised up-to-date desk reference can be made at any time.

The Guide can be searched by:

Name of Service (or part thereof)
Category of Service
Environmental Theme
Information Types Available
Cluster
Controlled Keywords (from GEMET)
Open Keywords
Geographic Scope

The following diagram illustrates the main query page of the online Reference Guide information service showing the six different search criteria that can be employed as well as refining by geographic scope.



The query system is available for open access through normal Internet browsers. (At time of this report through a test site: http://quin.unep-wcmc.org/conventions/rincis)

The online Reference Guide is supported by a database that can be updated at will, so the scope of coverage of the Guide can be expanded at any time, and search criteria easily altered. Technical details and a users guide are available in Annex II.

3.4 HARMONIZATION AND RATIONALISATION INITIATIVES

3.4.1 Benefits of Harmonization and Rationalisation

The words harmonize, rationalise, streamline, integrate refer to various actions aimed at making information more accessible, useful and cost-effective. Roughly speaking, harmonization refers to measures intended to make disparate information compatible (rather than standardised) and similarly to make programmes (such as MEAs) complimentary or compatible in scope and intent; rationalisation applies to programmes or institutions aimed at reducing duplication and hence increasing efficiency; streaming eases the flow of information easier and more efficient (usually in the context of reporting, by reducing unnecessary information collection); integration refers to bringing information sources together (after harmonization has made the information compatible).

Harmonization and rationalisation (and so on) seek two primary benefits - information that is more useful for policy (improved quality compatibility and reliability) and improved efficiency (lower costs to support information management and institutions). The benefits accrue to all stakeholders:

To MEA Secretariats and Intergovernmental Organisations:

- improved ability to assess achievement of objectives and set future priorities
- improved efficiency (reduced cost) of information management
- reduced cost of information technology implementation
- improved integrated analysis capacity and improved ability to co-ordinate interagency programmes of work, through sharing of information and experience
- improved information quality, consistency and transparency
- improved linkages with international environmental monitoring agencies, major data custodians, and regional organisations.

To national governments:

- reduced burden of meeting reporting obligations
- improved comparability with other countries
- increased ability to develop and use clearing-house mechanisms and integrated indicators
- improved efficiency and effectiveness of national biodiversity information systems in support of strategy and policy development, and consequent implementation
- improved ability to implement country-driven actions in support of international obligations.

To the world community

- improved awareness of emerging issues and inter-relationships
- global and regional overviews (e.g. facilitated inputs to global assessments)
- reliable and comparable information for research.

It is with these benefits in mind that a large number of programmes and initiatives and in some cases institutions have been launched, and this raises the questions:

Which programmes should be supported?
Which are most likely to achieve expected benefits?

3.4.2 Overview of Harmonization Initiatives

In the course of this project we have identified approximately 65 programmes, projects and institutions attempting to harmonize integrate or rationalise nature conservation information. Not all of these are currently active, but all have been at some time in the last two years. Significant initiatives occur in almost all of the 10 main clusters. An approximate breakdown is as follows:

Cluster	No of Initiatives
Cluster 1 - Convention and Treaty Information Sources	17
Cluster 2 - Information on Sites	5
Cluster 3 - Development projects and donor information	3

Cluster	No of Initiatives
Cluster 4 – Clearing-House Mechanisms & Integrated Exchange Networks	4
Cluster 5 - Environmental Law	1
Cluster 6 - Global and Regional Long Term Ecological Monitoring	5
Cluster 7 - Taxonomic Information	12
Cluster 8 - Species Status Information	7
Cluster 9 - Policy and Strategy Information	0
Cluster 10 European Nature Conservation Information	12

The principal players in these efforts include UNEP, treaty secretariats, other UN organisations, sponsored national and academic institutions, and intergovernmental agencies.

One can see the relatively large amount of activity surrounding harmonization of conventions, species information and taxonomy, but it is difficult to organise, classify or summarise the programmes. Each is described in short (or at length) under the separate cluster analyses that follow. In some cases the harmonization programme is coincident with the information source and thus is described in a profile in the Reference Guide as well as in the analysis of initiatives in the appropriate cluster. In some clusters the situation is straightforward with only one dominant programme - such as ECOLEX under the Environmental Law cluster. Other clusters have two or more closely related initiatives such as IUCN-SIS and the UNEP-WCMC Species databases in the species cluster where the separate roles have yet to be clearly defined. In the taxonomic cluster there are several apparently overlapping initiatives (such as Species 2000, GBIF and the All Species Inventory) that may have agreed to rationalise their efforts. Some clusters have very complex situations, such as in the European cluster and are elaborated more fully.

We have therefore linked the discussion of the harmonization programmes to their information services within the respective clusters and have developed and organised recommendations on that basis.

4 IMPROVING EXISTING SOURCES AND SERVICES

4.1 INTRODUCTION

In the two decades since the International Forum on Environmental Information noted the deficiencies in information sources for policy-making, a vast number of new information sources and services have developed and the technology for effective search, linkage, and usage of such sources has improved dramatically.

As summarised in Section 3.2 we have identified 187 significant sources relevant to nature conservation policy in the UK. Many of these are networks that provide access to thousands of sectoral and specialised sources. Although there are some gaps (for example, co-ordinated access to information on case studies and best practices), lack of information is not the primary problem. The question is how to improve these existing sources, particularly for use in nature conservation policy-making.

The following text outlines the main improvement issues and directions. Recommendations on how to make such improvements can be found in the subsequent sections.

4.2 AREAS FOR IMPROVEMENT

4.2.1 Locating Information Resources

Effective location of appropriate resources requires good metadata (that describe both the content and quality) and good search tools. Although there are major metadata services such as CIESIN and more specialised metadatabases, such as those provided by the EEA, to search for products, reports and datasets, improvements are needed in the content of the metadata especially with regard to information surrounding quality, and to the vocabulary used in indexing.

Broadly based Internet search services such as Google or Altavista are mainly useful for locating institutions or organisations, while subject searches in nature conservation almost inevitably over-identify and provide no means to be selective on quality, timeliness or relevance. This has spawned the need for more directed metadata such as the RINCIS Reference Guide developed as a part of this project.

More work on standardised vocabulary (such as GEMET) is needed and more **use** of standardised vocabulary by information suppliers would be beneficial, even the simple matter of consistent use of country names (or use of ISO coding for countries). For example, Ramsar and WHC are not consistent with the official naming of Parties, apply little or no checking of the use of country and region names within party-submitted documents, and do not explicitly consistently code documents for retrieval by country.

4.2.2 Consistency in Availability

There is wide variability in the types of information available from sites that have similar purposes. This is best exemplified by the Convention Secretariats, where:

- some provide lists of national focal points, some do not
- some provide all national reports, some only the more recent, some none.
- only some provide a search tool for the site, and there is no ability to consistently search across the main biodiversity Convention sites.

For example, the CBD Website makes all national reports available, while older treaties like CMS have only posted the more recent reports. At the same time, while CBD provides search tools on their website, the CMS provides no means to search across the websites of all the related Agreements.

4.2.3 Quality Management

Quality and quality review of information sources is uneven and generally minimal, and very often not stated or identified in metadata. Very little information is time-stamped. Original sources for information in integrated networks can be highly variable in reliability (e.g. from volunteers, NGOs, academics, official government sources, etc), and often neither the source of the information is clear, nor what has been done with it subsequently. Quality review processes, where they exist, are often applied inconsistently - being well done during a well-funded start-up project and ignored during later up-dates and additions.

For example, convention secretariats, such as the CBD, and UN organisations, such as Food and Agriculture Organization, often feel obliged to accept at face value "official" information supplied by parties, even if containing obvious mistakes or unlikely information. Other organisations such as the OECD and the EEA maintain "reference information" from external sources to use in cross checking for consistency and then politely question anomalies.

UNEP-WCMC make considerable effort to verify the location information on protected areas before it is entered into the GIS part of protected area databases, but changes made in co-ordinates may result in inconsistencies between versions of the "same" information held nationally or by other bodies. The quality review process used is nowhere documented.

In general, users commonly depend on the reputation of the source institution as a guide to quality, but this is no guarantee. Information provided by totally reputable sources has proved on occasions to be totally wrong.

4.2.4 Long-term Management of Datasets

The importance of a dataset, and the length of time that it has been developed over, does not mean that it is either complete or adequately funded. There are datasets that are internationally regarded as core datasets, such as the World Database on Protected Areas, where low and irregular funding over more than 20 years has resulted in the development of a major dataset, but one which still contains too many flaws because of the inconsistent and project-oriented nature of its funding. In such cases only a clear user community who are prepared to properly contribute to maintenance of the data can provide the necessary stability for proper development of the information service. The GTOS-TEMS datasets are another good example, where there is no long-term funding and information is added on an opportunistic project basis, and this was also true of its predecessor in the UNEP-GEMS programme.

4.2.5 Inflated Claims

There are information services, and indeed harmonization initiatives, that claim to be able to deliver far more than they in fact can, for instance claiming to be a "definitive" or "complete" source. This can be a problem because of the potential ability of such claims to reduce the profile (and funding) of less vigorously promoted services that can in fact deliver far more. The key issue is to identify what information the services and sources can actually deliver, rather than what they say they can deliver. Again the RINCIS Reference Guide is a step towards that but and there is a role here for authoritative bodies to more exercise some influence in reducing outrageous "vision statements", and for funders to be more sympathetic to modest but clearly defined information systems that contribute to the whole.

5 ACHIEVING HARMONIZATION AND RATIONALISATION

5.1 BARRIERS

The relative lack of progress in achieving harmonization and rationalisation in the last decade indicates that it is a difficult process, with genuine barriers beyond sheer pig-headedness of individuals or competitiveness of institutions. Some of the principal barriers are:

- Lack of an overall vision for nature conservation information management or even an understanding of what can be done.
- Genuine scientific uncertainly or debate (beyond minor individual differences) that makes true standards difficult to achieve
- Differing constituencies of the institutions, and hence differing purposes and directions for information collection and management
- The slow pace of official decision-making - for instance in the MEAs where there may be several years between meetings of official governing bodies.
- Relative low priority given to "administrative" issues such as harmonization by delegates at official meetings compared to specific conservation issues.
- Differing economic, social, administrative, and statistical systems of states and regional groupings so that information assembly in one is structurally incompatible with others.
- Political imperatives that suggest that only certain "official" information sources can be used
- Insufficient funding for information management in information custodians and networks - especially in the MEA secretariats, and for long-term monitoring. This is exacerbated by apparent (and real) duplication of efforts and competitiveness between agencies, so that there is a feeling that "there is enough money out there" - no more need be added if institutions were rationalised
- Fragmented responsibility for national biodiversity information management
- Institutional efficiency vs. collective benefit - harmonization may be seen as an added cost (or "tax") that provides no internal benefits to the institution
- Lack of harmonization tools, for instance to align ecological classification systems, equate terminology
- Instinctive institutional resistance to "rationalisation" - even to efficiency measures such as co-location, shared secretariats, shared information technology and information custodians.

The net effect of these barriers is that institutions are often in favour **in principle** of harmonization, but unwilling or unable to participate if it costs any time or money. Further, institutions or programmes set up explicitly to integrate, harmonize or exchange information have great difficulty in securing assured base funding.

Overcoming the barriers will require:

- a clear understanding of the purpose and benefits at all levels
- interagency co-operation
- multi-national co-operation
- information and experience sharing
- wide consultation with stakeholders
- progressive and incremental steps through pilot projects that solve practical problems
- adoption of tested procedures for wider implementation
- pragmatic decisions on institutional rationalisation and support for programmes.

5.2 METHODS AND LEVERS

The UK Government, like all nation states, does not have the authority to change or rationalise institutions or programmes beyond its borders. It does, however, possess a number of means to influence the direction of events and to encourage and support more rational and harmonized

approaches. It is one of the objectives of this project to recommend how this influence might be exercised. Some of these methods and levers are:

Formal Governance Bodies
The UK sits on governing bodies of a number of international organisations and of a number of international conventions and treaties. Prime examples are the Governing Council of UNEP and the Conference of Parties of the CBD. While these normally operate by "consensus", the UK representatives are in a position to influence decisions by collaborating with other like-minded parties to put forward proposals and can develop recommendations at subsidiary bodies for further consideration.

European Commission
Membership of the Environment Council and national representation on the Management Board of the EEA are important levers for the UK. As well, informal contacts with the Commission can be influential. The UK, of course, has elected MEPs at the European Parliament who can influence legislative development related to the environment and the general budget and directions of the financing of measures and actions, but these individuals are not bound or directed by UK government policy.

Committees and Working Groups
UK representatives participate in on working groups and committees (formal and ad hoc) struck by or related to:

- MEAs (such as CBD, AEWA, CITES),
- intergovernmental organisations (such as IUCN) and
- European agencies and bodies (such as EEA, Council of Europe, DG Environment).

These can be excellent fora to bring forward proposals and suggestions to work constructively on harmonization tools and methods, to advocate streamlining and simplification, and to find common ground with other countries to formulate formal proposals or adjust current programmes and workplans. In addition to national representation , it is common for UK-based scientists (government and academic) to have posts on working groups and committees as international experts in their field. In fact, the high regard for UK scientists and practitioners internationally may mean there is disproportionate representation on such bodies. Such experts may often be very influential since they are seen as being unbiased, and as giving advice in consideration of the collective good - particularly when it comes to harmonization tools and standards.

Respected UK Institutions
The UK has a number of national institutions that have gained international respect as centres of excellence and expertise in nature conservation. These include *inter alia:*

- Natural History Museum
- Institute for Zoology
- Royal Botanic Gardens, Kew
- Royal Botanic Garden Edinburgh
- Royal Society for the Protection of Birds
- Centre for Ecology and Hydrology (CEH)
- British Antarctic Survey.

Individuals from these institutions are often amongst those on working groups and committees noted above, but the respect for the institutions can also add value if they are seen to be authors or supporters of proposals and strategies. It is noted that the recent House of Lords Select Committee on Science and Technology (Third Report, 2 May, 2002) has recommended strengthening the role of Kew in regard to taxonomy. Currently CEH is very active in supporting harmonization of habitat classifications for Natura 2000 and PEBLDS.

International Institutions Resident in the UK

A number of international institutions related to biodiversity are located in the UK, usually with UK government investment and support of one kind or another. Most relevant are:

- UNEP-WCMC
- BirdLife International
- Flora and Fauna International
- WWF UK
- IUCN-Traffic
- International Institute for Environment and Development.

In most cases the UK has a stake in these organisations and can use their expertise networks and respect as an avenue for participation in international strategies and programmes, and as well obtaining advice and project results. The physical proximity of these centres facilitates contact and interaction.

Project Support

Supporting particular international projects or programmes with direct funding or in-kind resources is an important lever of influence. This support may be through "Trust Funds" to UN organisations, direct grants to intergovernmental agencies, or secondments and institutional partnerships. A good example is the partnership of CEH with ETC/NPB. Direct project commissions to UK institutions and international agencies resident in the UK can be very effective - for instance to conduct pilot or demonstration projects proving harmonization concepts that can be implemented more broadly and add credibility to proposals to formal governance bodies.

Just as it is desirable to seek international rationalisation, it is important to rationalise efforts nationally, and the use these levers in ways that are not working at cross purposes. The need for having an national big picture view is reflected in the strategic recommendations that follow in Section 6, and more specific recommendations on the projects and programmes most worthy of support are introduced in the detailed recommendations on a cluster-by-cluster basis in Section 7.

6 STRATEGIC RECOMMENDATIONS

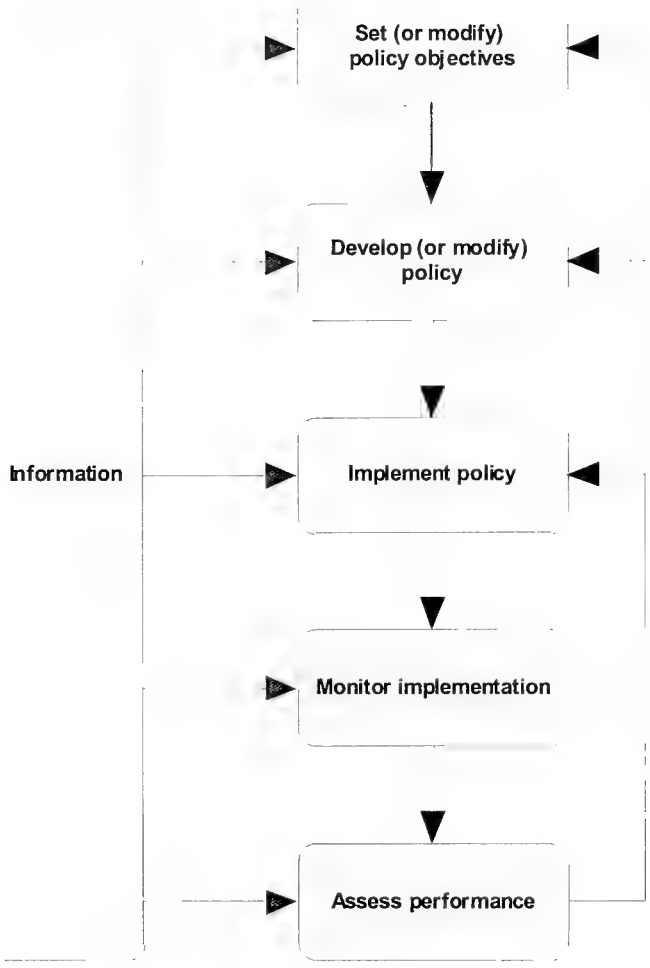
6.1 INTRODUCTION

The recommendations that follow in this section refer to general strategic directions for improving the use of international information sources in developing UK policy on nature conservation, and on how to obtain maximum benefit from support to, and influence on, the rationalisation of these sources.

To do this it is useful to have a general vision or model. As noted in Section 3 the integrative vision of the EU as expressed in EEA plans, and for broader Europe in, for instance the Pan-European Biological and Landscape Diversity Strategy establish the framework in which the UK will likely operate. The essence of this vision as expounded by the EEA is to take a "big picture" view and integrate nature conservation considerations with sustainable resource utilisation and socio-economic issues - with related indicators for both. This leads to a conceptual model for rationalised information management in which the scientific community and national institutions share information with community institutions and international organisations across a broad spectrum of "environmental" issues. In this model, a "Reference Centre" (in the case of Europe, the EEA) holds key information collated from a variety of networked sources. This network seeks to link the policy players (EEA, community institutions, international organisations) and the scientific community (academics , research, national institutions) creating a shared pool of information. For Europe this networking is achieved through EIONET, with the EEA holding the reference information. This concept was well described in the EEA Management Board Seminar in Copenhagen in November 2001 "Towards a Shared Streamlined European Environmental Information System". (Presented by David Stanners, Programme Manager, Strategic Development and International cooperation, EEA). To translate this model to the national situation, the "Reference Centre" would refer to national (government) information linked to the shared information of national and international institutions and centres of expertise. The practical consequence of achieving shared information is the need for harmonization tools to make shared information exchangeable and useable.

This concept is the basis for one of the themes reflected in the Strategic Recommendations of this section, that is to echo this integrated model at the national level to provide increased integration and better use of nature conservation information in a broad context.

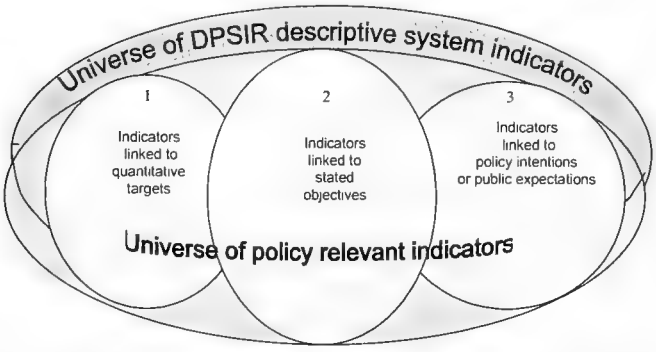
Another key to effective policy development and implementation is to ensure there is monitoring - based on measurement of the effectiveness of policy implementation - that will provide a feedback loop to modify and improve policies. This is illustrated schematically in the following diagram.



The concept, therefore is an information system supporting a policy process that considers nature conservation in a broad sustainable development framework, linked to measurable targets. This provides for policy implementation that can show accountability to MEAs as well as public expectations. The concept is shown in a European context in the following sketch[3]:

[3] Diagram courtesy of David Stanners, EEA

Driven by policy compromises, objectives and targets



Including, from quantitative-based targets → ...to accountable policy intentions or public expectations

In summary the recommended strategic directions are:

- ***Identify overall goals and directions***
- ***Integration to permit policy compromises***
- ***Measure policy performance against indicators***
- ***Develop a shared (and shareable) information base***

6.2 DISCUSSION AND RECOMMENDATIONS

For information to be useful and worthy of the expensive resources needed to assemble it, it is essential to know why it should be collected and how it will be used. That is, to take a "top down" approach that first identifies what issues require information. It is therefore important to ensure a clear understanding of UK information needs, and in particular needs from international information sources and services so as to effectively enter into a dialogue on how to improve these sources and services.

Strategic recommendation 1: Identify national strategic directions and goals for nature conservation and as a consequence define the needs and priorities for information.

Strategic recommendation 2: Review and discuss these needs widely within those agencies responsible for policy development and implementation, in order to ensure an integrated and co-ordinated approach to use of international information sources and services.

We note and support the recent recommendation of the House of Lords Select Committee on Science and Technology (Third Report, 2 May, 2002) that reads:

> *1.3 We recommend the Government develop and publish a clear, concise summary document regarding their policy in biodiversity conservation activity in the United Kingdom and on the international stage.*

This recommendation is in harmony with the two recommendations above and suggests one means of achieving dialogue on proposed strategic directions and goals.

In order to close the "feedback loop" it is necessary to have information that allows an assessment or measure of the effectiveness of measures and actions , including MEAs, rather than information on technical compliance.

> ***Strategic recommendation 3: Support the development of information networks and reporting mechanisms that allow for the assessment of the effects of instruments such as MEAs and of national and international actions towards the desired goals.***

Nature conservation does not stand alone, it is necessary to have a "big picture" and put classical nature conservation (species conservation, protected areas, etc) in the context of the" big picture"- integrated with resource management policies and infrastructure polices such as transportation. This implies closer integration of State of Environment reporting and sustainable development with nature conservation polices, and as well consideration of the impact on conservation of fisheries, forestry, agriculture and transportation policies.

> ***Strategic recommendation 4: Develop mechanisms for closer liaison between the various departments and sectors within the UK government structure in order to improve the capacity to assess the overall impact of policies on nature conservation and improve overall cross-cutting communication.***

We note the recent recommendation of the House of Lords Select Committee on Science and Technology (Third Report, 2 May, 2002) that reads in part:

> *1.8 We recommend that DEFRA takes the lead in setting up a body with the express purpose of bringing together representatives from Government departments, ecologists and conservationists and the systematic biology community... the body's main remit would be to:*
> *(a) identify priority areas of biodiversity for which taxonomic research is most needed by the conservation community, and for other national purposes, such as health and agriculture*

We support this recommendation while noting it addresses specifically taxonomy, and would suggest that a broader based body or series of bodies be established on a range of topics related to nature conservation.

The effective use of existing information networks depends on improved knowledge of what exists, how to use it and how to harmonize and improve it.

> ***Strategic recommendation 5: Ensure effective use of international information sources and services in development and implementation of nature conservation policy in the UK through the wide availability of metadata tools such as the RINCIS online Reference Guide, and improved knowledge of other information networks such as EIONET and Clearing-House Mechanisms.***

> ***Strategic recommendation 6: In supporting projects and programmes in information access and policy development, focus on the major players most relevant to the UK and UK policy, such as the EEA (and ETCs), UNEP, OECD, and those directly concerned with national implementation of international agreements.***

It is clear that the UK government should contribute to, encourage and support the improvement of international networks for nature conservation information gathering and exchange. This should be done in a way that maximises the availability of information needed in the context of national goals and obligations, and encourages assessment of global trends and issues. Factors that should be considered for establishing priorities for such support include relevance, efficiency, and quality.

Strategic recommendation 7: Support international initiatives that are leading to harmonization of information sources and services, including through the implementation of pilot and demonstration projects within the UK.

Strategic recommendation 8: Take steps to support improvements in existing information sources and services where they are not currently adequate to UK needs and purposes.

Strategic recommendation 9: Promote development of further international information sources and services, where there are significant gaps, especially those that can provide credible information on global and regional trends, and that can serve multiple policy purposes.

Strategic recommendation 10: Support measures and information services that assist:
- ***Implementing European policies, Directives and other obligations***
- ***Accessing case studies and best practices***
- ***Reducing/streamlining reporting processes***
- ***Improving access to experts***
- ***Improving early warning of emerging issues.***

7 ANALYSIS AND RECOMMENDATIONS BY CLUSTER

In the following sections of Chapter 7, the issues and current harmonization activities are discussed for each cluster of services. In general the approach is to, identify the **players** in the area, consider the main **issues and concerns,** describe the main **harmonization initiatives** currently addressing these concerns, and finally to discuss and present **recommendations**. An introduction precedes the discussions of each section, and also lists the key information sources for the cluster. Many of the key information sources and services are critically examined within the discussion. Descriptions of all the services can be obtained through the Reference Guide, and can be listed or selected by cluster.

This structure is not followed exactly in each section; variations reflect the nature of activities and priorities in the cluster. Particularly the highly complex situation of information management on the European level requires more elaboration.

The recommendations are divided into "strategic" - those that indicate general directions, and "practical" - those that provide potential specific implementation alternatives to address the strategic recommendations.

Finally this Chapter (section 7.11) provides some recommendations that cross-cut the specific clusters, particularly to pick up the theme of "integration" highlighted in Chapter 6.

7.1 CLUSTER 1 - CONVENTION AND TREATY INFORMATION SERVICES

7.1.1 Introduction

This cluster covers information services provided by international treaty secretariats, and those intended to provide integrated information or harmonization across MEAs.

There are a total of 21 sources in the Reference Guide and the key sources are as follows:

- Convention on Biological Diversity Secretariat Website
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat Website
- Convention on the Conservation of Migratory Species of Wild Animals (CMS) Website
- Ramsar Convention on Wetlands Website
- UNEP-WCMC Harmonization of National Reporting Website
- UNESCO World Heritage Centre

7.1.2 Players

The principal active players in initiatives to harmonize the activities of, and foster synergies between, the MEAs are UNEP, UNEP-WCMC, the European Environment Agency and the convention secretariats and governing bodies themselves.

7.1.3 Issues and Concerns

The push for improved harmonization is three-fold:

- To facilitate national implementation (including reporting) of the MEAs
- To improve the overall effectiveness in meeting the objectives of the treaties, through synergies and co-ordinated actions
- To explore the full value of data and information by improving access and compatibility.

While there are a number of different activities that could benefit from rationalisation and harmonization in the cluster, the most important are:

- Scientific developments: - harmonization and standardisation of definitions, terminology, classification systems, taxonomies
- Procedures: - synchronisation and co-ordination of governing meetings, steps to encourage and make more feasible the consolidation of national focal points and memberships in subsidiary bodies,
- Information management: - improving access to national reports, case studies, lessons learned and other information filed by Parties, and providing seamless cross-treaty searching.
- Strategic measures: - rationalisation of scope, geographic coverage, and objectives to fill gaps and avoid overlaps
- Reporting: - synchronising, streamlining, harmonizing and simplifying the reporting burden placed on parties.

By far the major emphasis has been on the last of these - that of harmonization and streamlining of reporting.

Leading to the current key initiatives, there have been a number of steps and programmes in the last few years that had relevant outputs or recommendations.

7.1.4 Past Harmonization Initiatives

Commission for Sustainable Development

At their sessions during 1994-1997, the Inter-Agency Committee on Sustainable Development (IACSD) discussed the issue of harmonizing national reporting. They concluded that the issue was difficult to address for a number of reasons relating to whether the report was voluntary or binding in nature, variations in periodicity and the nature of the information requested. IACSD recommended that the next step that needed to be taken was to streamline the requests for information that were being made to national governments.

For some years, the Commission has made every effort to encourage countries to submit their reports on the implementation of Agenda 21 in electronic format, and to this end provides guidelines and forms for completion. The information received through the reporting process is compiled in the UN system-wide website on sustainable development, where information can be accessed on a country-by-country or issue-by-issue basis. In addition to this, an interactive database on national information is being developed to facilitate submission of national reports to future CSD sessions as well as to optimise the use of national reports and therefore the exchange of information.

UNDP and the Rio Agreements

In 1997, UNDP convened an expert meeting to explore ways to create synergy between and among the "Rio Agreements". This meeting was based on two fundamental principles developed in consultation with participants and stakeholders, including representatives of the Secretariats of and Parties to the instruments:

- a recognition of potential synergies among the instruments must be an integral part of the planning process and implementation for each; and
- strengthening and building in-country capacity is essential for producing synergy in the implementation of the agreements.

Working Group 4 of this meeting covered the issue of information and reporting requirements, and recommended a number of key actions for national and international attention.

UNEP Biodiversity Data Management Project

From 1994 to 1998, UNEP, in collaboration with the then World Conservation Monitoring Centre (WCMC), carried out a project entitled "Biodiversity Data Management Capacitation in Developing Countries in Networking Biodiversity Information (BDM)". This project was financed by the Global

Environment Facility (GEF) and had the long-term objective of enhancing the capacity of developing countries in data management to support the implementation of the Convention on Biological Diversity (CBD) by improving the availability of reliable, up-to-date scientific information to support biodiversity management and planning. The project sought to build the information management capacities of nations through the provision of support to national organisations generating and maintaining biodiversity data.

United Nations University

As part of their ongoing work to assist in the development of a synergistic and co-ordinated approach to environmental policy-making that takes account of existing inter-linkages between environmental issues, the UNU and its partners have convened two conferences (one global, one regional). The objectives of these conferences were to:

- create awareness at the public, governmental and intergovernmental levels of the importance of synergies and co-ordination between MEAs;
- survey existing initiatives;
- foster discussion and interaction among international institutions, scholars and other relevant stakeholders who can co-operate to identify and examine opportunities; and
- identify concrete mechanisms, next steps and feasible win-win paths to move forward on this important issue.

The main outputs were recommendations on the promotion of inter-linkages between MEAs in the areas of harmonization of information systems and information exchange, finance, issue management, scientific mechanisms, and synergies for sustainable development.

Treaty Harmonization Feasibility Study

In 1998 the five global biodiversity-related treaty secretariats and UNEP commissioned the then World Conservation Monitoring Centre (WCMC) to undertake a feasibility study to identify opportunities for harmonizing information management between the biodiversity-related treaties - CBD, CITES, CMS, Ramsar, and WHC. The study considered approaches towards development of a harmonized information management infrastructure for the treaties within their existing defined mandates. Its purpose was to consider how the secretariats could improve effectiveness and efficiency in gathering, handling, disseminating and sharing information, and the secretariats have made some follow-up since that study was completed. The study recommended three main streams of action:

At the Workshop, three streams of action were agreed as feasible and of strategic value in further harmonized information management for the five biodiversity-related conventions. They were:

- Developing a harmonized convention information resource covering all five biodiversity-related conventions, including
  - *Harmonizing document cover sheets*
  - *Adopting a standard thesaurus for keywords and searching*
  - *Harmonizing web sites*
  - *Developing a metadatabase*
  - *Developing an inter-convention web site and search engine*

- Streamlining national reporting to, and implementation of, conventions, including
  - *Reviewing and clarifying reporting requirements of each convention*
  - *Preparing an integrated handbook of national reporting*
  - *Pilot testing of the handbook (proof-of-concept)*
  - *Capacity building in national biodiversity information banks and related technology*

- Developing a lessons-learned network, including
  - *Selecting case studies ("lessons-learned" from existing secretariat documents*
  - *Developing prototype lessons-learned web site*

- *Establishing links to lessons-learned of development agencies, and national lessons-learned web sites.*
- *Linking lessons-learned network to CBD-CHM.*

UNEP Biodiversity Planning Support Programme workshop

In May 2001, UNEP and the Foundation for International Environmental Law and Development convened a workshop on "Legislative Complementarity and Harmonization of Biodiversity-related MEAs". The workshop was attended by representatives of the CBD and other biodiversity-related treaties, and nine countries. The objective of the workshop was to discuss key areas of overlap and synergy between the biodiversity-related conventions, as part of a programme to:

- facilitate a harmonized, integrated and cost-effective approach to implementing the CBD and other biodiversity-related conventions at the national level;
- contribute to improving policy, legal and administrative co-ordination at national level in order to comply effectively with international obligations; and
- publish and disseminate a set of best practice guidelines on co-ordinated national implementation of biodiversity-related conventions at national level.

Secretariats to the Global Biodiversity Conventions

The secretariats of the global biodiversity-related treaties are aware of the need to increase access to the information that they manage, and to streamline and harmonize information management and reporting. To this end, they have taken a number of steps in recent years, for example:

CMS: Over the years, CMS and the various agreements under the CMS umbrella have developed approaches to reporting and information management that, although similar, are not integrated. The CMS Secretariat is now leading efforts to synthesise and integrate the information contained in the national reports provided to the CMS and Agreements secretariats, and is developing a more integrated approach to reporting on migratory species. CMS is also following Ramsar in moving towards reporting more closely linked to the strategic plan. The more thorough synthesis of the national reports is also leading to a helpful review of the implementation of the Convention and the Agreements.

CBD: The CBD Secretariat has taken a lead in ensuring that not only are all the reports submitted to the secretariat available online, there are also search tools that facilitate access to the information that these reports contain. In addition, the second round of national reports have moved away from a text-based report to a questionnaire which provides a checklist of those actions that a Contracting Party is obliged or requested to undertake as a result of Convention Articles or conference decisions. The resulting information (and the analysis thereof) is managed in a database and available online.

Ramsar: For many years, the Ramsar Convention Bureau has provided Parties with clear guidance on how to prepare national reports. In 1999, 107 out of a possible 110 Parties submitted national reports (three were exempt), and all of these reports are available online. The guidelines have evolved over the years, and now focus tightly on the strategic plan. The latest version of the reporting tool is now serving as a planning tool for implementation of the strategic plan at the national level. As of June 2002, 82 reports have been submitted using this new format.

CITES: CITES has provided "Guidelines for the Preparation and Submission of CITES Annual Reports" since 1994 (comprehensively revised in 1999), and is now exploring how the quality of annual reports might be improved, how the data might be better presented and used, and how to ensure timely submission of national reports. Compared to the annual reports, national submissions with respect to CITES Biennial Reporting has been less satisfying. The Secretariat has begun studying the submission rates and contents of biennial reports, with a view to developing guidelines for these reports too.

World Heritage: The World Heritage Convention has only recently begun a periodic reporting process with a 6-year periodic reporting cycle. Reporting formats and explanatory notes were adopted in

1998. Currently the results of regional reports for Africa and the Arab states are being reviewed, with a view to learning from what has been done so far. With an increased focus on information management, experiments are beginning on reporting via electronic means by using web templates, and some discussion has been entered into on linking this to Internet-based management of information

Regional seas conventions

Nairobi Convention: The Contracting Parties to the Nairobi Convention, meeting in May 2000 to assess progress in implementation of the CBD Jakarta Mandate in the Eastern Africa region, compiled information country-by-country on the action taken. Their report, and the process used in compiling it, was presented as a potential model for all regional seas conventions and action plans to report to the CBD on progress made in the implementation of the Jakarta Mandate.

Cartagena Convention: Initial discussions on national reporting took place at the first meeting of the SPAW Scientific and Technical Advisory Committee. In particular as regards the establishment of a reporting process under the new SPAW Protocol, the value of integration with the reporting, formats and processes under other biodiversity-related treaties (e.g. CBD, Ramsar and CMS) is well understood. The results of the UNEP pilot projects (cf. below) will be reviewed before final decisions are made.

7.1.5 Current Harmonization Initiatives

UNEP Synergies Meetings

UNEP regularly convenes "synergies" meetings of convention secretariats to promote co-ordination between them, and has also organised several expert meetings on collaboration and inter-linkages. UNEP's five priorities for work in this area are: promoting information exchange amongst secretariats; strengthening collaboration amongst the conventions' scientific and technical bodies; revitalising support to the regional seas conventions and action plans; making international trade and environmental regimes more compatible; and streamlining national reporting. UNEP has created a "MEAs Working Website", and produces a *Synergies* bulletin twice a year, which aims to promote collaboration on environmental treaties.

Environmental Management Group

The EMG is a forum for UN agencies and MEA secretariats established under the chairmanship of the UNEP Executive Director with the aim of enhancing interagency co-operation in the field of environment and human settlements. The first meeting of the EMG in January 2001 established an **Issue Management Group** (IMG) to deal with harmonization of environmental reporting, with a focus on biodiversity-related conventions. UNEP was asked to serve as the task manager.

UNEP has convened one meeting of the IMG by teleconference, and has prepared a working paper that included the following recommendations and concepts for discussion:

- Test methods of harmonizing national reporting nationally and internationally
- Test a wider-scale harmonized approach for a specific theme or issue
- Identify ways to build on the related initiatives of others
- Integrate information management at the international level
- Improve access to the experience of others
- Ensure that national reports and key assessments together cover the "Big Picture"
- Organised inventory of obligations
- Resurrect and improve the joint website of the biodiversity-related conventions.
- Prepare a "Handbook" to reporting, incorporating existing formats, rationale and timetables
- Inter-linking and rationalisation of reporting timetables of the MEAs
- Have all national reports accessible on the Internet
- Build a metadatabase of official documents and information papers of MEAs

- Harmonization of terminology and classification:
- Develop demonstrations of streamlined reporting through electronic means

The working paper is currently under review in order to develop an action plan for further harmonization and streamlining work.

UNEP Pilot Projects

In October 2000, UNEP convened a workshop to explore concepts proposed for a more harmonized approach to national reporting to international agreements and to develop pilot projects for testing these ideas at national and international levels. The workshop was attended by representatives of eight convention secretariats, eight countries and several international organisations involved in exploring the potential synergies between international agreements and programmes.

Following the recommendations of the workshop, UNEP is implementing a series of national pilot projects to assess different approaches to harmonized reporting for the global biodiversity-related treaties. Seven countries expressed willingness to participate, and to date four pilot projects are currently active (March 2002). These pilot projects cover: consolidated reporting to a range of agreements (Seychelles); modular reporting approaches (Indonesia); the link between reporting to international agreements and the state of environment reporting process (Ghana) and support from regional organisations for national information management and reporting to biodiversity-related conventions (Panama).

Based on the experience of the pilot projects, due to be completed in late 2002, future steps include the development of handbooks and guidelines to streamlined reporting, capacity building at the national level, and more extensive pilot testing of the most viable options.

CBD – Clearing-House Mechanism

The Clearing-House Mechanism (CHM) was established in order to promote and facilitate technical and scientific co-operation in support of the Convention. It is intended that the CHM becomes the primary global co-operation and information network on the conservation and sustainable use of biological diversity. It aims to promote and support at the local, national, sub-regional, regional and international levels: better, more cost-effective decision-making; international co-operation and sharing of related technology, training, education, research, information and expertise; reduced duplication of related efforts; and therefore quicker, better and more cost-effective implementation of biodiversity-related initiatives.

Working in collaboration with related global initiatives, the CHM aims to link and synergize their contributions, and help to consolidate and influence the development of the biodiversity component of an emerging global information infrastructure covering many other subject areas as well. Embracing person-to-person, paper-based and electronic components, it aims to operate as a decentralised, open and transparent, distributed network of mutually supportive networks, taking a proactive and collaborative approach to identifying, prioritising and meeting the needs of its wide range of users, and endeavouring to expand its activities and services over time to meet the broad objectives of the Convention.

CBD Informal Meeting(s) on "Formats, protocols and Standards for the improved exchange of biodiversity information"

An initial meetings was held at the CBD Secretariat in Montreal in February, 2002, in response to recommendations of the SBSTTA to develop a pilot initiative to assist work on thematic issues and in particular to co-operate with the Global Invasive Species Program.

Participants included: IABIN, GBIF, GISP, GTI, UNEP-WCMC, Ramsar, UNEP, IT IS, BCIS, INBio, and a number of national agencies active in biodiversity information - such as the USGS, National Museums of Kenya, Chinese Institute of Zoology, and so on.

This initial meeting was largely expository - with presentations on current activities and approaches in participating agencies. General recommendations were formulated on agreed principles and priority areas for future work. Some of these are:

- Encouraging the use of metadata standards to facilitate searching, locating and retrieving information
- Exploring development of multi-lingual common vocabularies and thesauri
- Adopting existing standards and taxonomies and making linkages and consolidation of initiatives such as GBIF, ITIS and Species 2000
- Develop a CHM "toolkit" of existing standards, formats and protocols for crating interoperable national nodes for the exchange of biodiversity information
- National report format harmonization
- A number of recommendations on specific technical data and metadata standards.

A great deal of this discussion was reminiscent of the former UNEP Office of Harmonization of Environmental Measurement that was closed in 1996, and it would be valuable to pick up these issues again. Seemingly missing from this initial meeting was discussion of standards (or harmonization) of ecological and biophysical terminology and classification systems outside of taxonomy - e.g. bio-geographical classifications, vegetation, land cover, soil, "bio-topes", habitats, etc.

It is unclear at this time whether this informal meeting will evolve into an on-going effective process to make progress on these issues.

7.1.6 Recommendations

It is clear that efforts at harmonizing the conventions and streamlining the associated reporting obligations have had slow and unsteady progress over the last five years, in spite of many meetings and initiatives. Currently the process is losing momentum and is in need of increased focus, direction and sense of urgency, which might lead to the various convention governing bodies placing more priority on this issue.

Strategic:

> ***Strategic recommendation 1.1: Promote and support efforts to harmonize and streamline reporting procedures and requirements of MEAs.***

> ***Strategic recommendation 1.2: Promote and support efforts to rationalise the scope and intent of MEAs and to develop mechanisms for improved collaboration in implementation.***

> ***Strategic recommendation 1.3: Encourage MEAs to focus on collecting only the information relevant to assessing and increasing the effectiveness of the treaty, or supporting implementation by other parties.***

> ***Strategic recommendation 1.4: Consider means of adapting national environmental reporting systems to gather and consolidate information for multiple national and international use more efficiently.***

> ***Strategic recommendation 1.5: Promote the development of integrated information tools and approaches to facilitate MEA implementation.***

Practical:

Recommendation 1.1: Through the Governing Council of UNEP and governing bodies of MEAs, support decisions that recommend treaty harmonization and co-operation, and support accompanying resource allocations.

Recommendation 1.2: Support current and future UNEP pilot projects in harmonization of reporting by, for example, supporting a national pilot project within the UK, or sponsoring one or more pilot projects in a developing country of importance to the UK.

Recommendation 1.3: Encourage UNEP to move forward from the current pilot projects to related implementation and capacity building, also taking further account of the recommendations of international workshops on this issue.

Recommendation 1.4: Participate in or otherwise support CBD information-related activities such as the meetings on "Formats, Protocols and Standards for the improved exchange of biodiversity information".

Recommendation 1.5: Encourage MEA secretariats to work jointly on the development of harmonization tools for nature conservation information - and to ensure that these efforts are linked to European initiatives such as Natura 2000, and international approaches such as GTOS and ILTER. Some particular areas in need of harmonization tools are habitat and ecosystem classification, protected area designation, conservation and biodiversity status.

Recommendation 1.6: Encourage MEA secretariats to make all documents (current and past) available online, including national reports, and encourage UNEP to work with the secretariats to facilitate integrated access to these documents and reports.

Recommendation 1.7: Encourage MEA secretariats and other appropriate organisations to make case study information more readily available, to build "lesson-learned" libraries and to develop tools to facilitate access to them.

Recommendation 1.8: Promote greater integration of the CBD Clearing-House Mechanism "network", and push for increased emphasis on promoting technical and scientific collaboration.

Please also take note of the related recommendations that follow from Cluster 10 - European Nature Conservation Information.

7.2 CLUSTER 2 – INFORMATION ON SITES

7.2.1 Introduction

This cluster is concerned with information services that provide information on protected areas, and officially designated sites of various kinds (national and international), sites of particular conservation interest (even if not nationally designated), site based datasets (especially if long-term) and site conservation and management.

In total there are 27 information sources in the Reference Guide, and the following are the key sources:

- Biosphere Reserve Integrated Monitoring Programme
- BirdLife International - Important Bird Areas Database
- Bern Convention Website
- Natura 2000 Network
- Ramsar Database
- UNESCO Biosphere Reserve Directory
- United Nations List of Protected Areas
- World Database of Protected Areas (WDPA)

7.2.2 Players

The key players in protected areas information globally are UNEP-WCMC, WCPA, and the various international agreement and programme secretariats (although the interest of the latter is more closely related to the specific interests of their agreements and programmes).

UNEP-WCMC and the IUCN World Commission on Protected Areas

UNEP-WCMC is probably the organisation with the strongest general interest in rationalisation of protected areas information, although specific secretariats are also keenly interested in aspects of this work related to their interests. For many years UNEP-WCMC and WCPA have collaborated closely on issues related to protected areas information and information management. In addition, WCPA has strong interests in increased and co-ordinated access to information that ensures the sharing of experience and the identification of best practice.

International agreement and programme secretariats

A significant number of international treaties and programmes call on nations to protect or conserve areas for specific purposes. Many of these give international recognition to specific sites, for example the World Heritage Convention and the Convention on Wetlands are both concerned with protection of specific natural sites, and at least 11 other global and regional agreements and programmes recognise or designate specific protected areas. Other treaties define a need for protected areas in support of their objectives without giving recognition to specific sites, for example Article 8 of the Convention on Biological Diversity requires each Contracting Party to *"establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity"* and to manage them effectively.

European organisations

Within the European Union, the *Natura 2000* programme represents an initiative to integrate and rationalise information on designated sites under both the Habitats and Birds Directives. The key player is the European Environment Agency, particularly the European Topic Centre for Nature Protection and Biodiversity (ETC/NPB) in Paris. There is a close working relationship with the Council of Europe to ensure that information needs and management for the Bern Convention "Emerald Network" are developed along parallel lines. The EEA, UNEP-WCMC and the Council of Europe work together very closely to ensure that within the European context there is no duplication of effort in collection of information on protected areas.

International non-government organisations

Other organisations are interested in sites for specific reasons that can be defined in terms of particular species, habitats or other natural and cultural features. These include such international NGOs as BirdLife International (which has strong links to RSPB) and Wetlands International.

7.2.3 Issues and Concerns

Harmonization

There are many global and international agreements and programmes of various sorts that either recognise or designate individual protected areas. Within Europe alone, there are ten of such agreements and programmes. There is one site in Europe, though not in the UK, that is covered by six different agreements and programmes! There is little real collaboration in reporting and information management, and each agreement and programme has different nomination and reporting requirements and timetables.

Potential duplication and competition

The number of players (and at times the degree of disorganisation and competition between them) poses real obstacles in compiling information on sites in Europe, developing associated information services, and in working towards some degree of harmonization. There is a need to ensure a clear definition of roles and responsibilities in order to ensure no duplication of effort, reduced burden on national agencies and cost-effective and cost-efficient solutions.

Access to information

There is no single source of (or portal to) information on all of the international programmes and agreements related to sites, making it difficult to understand all of the initiatives and relationship between them. Similarly there is no easy access route to information on many of the site networks, and certainly no consistent access to site-based information.

Natura 2000 and EUNIS

While countries have provided Natura 2000 and EUNIS with extensive information on SPAs and SACs, there is only limited access to this information currently, and it is likely to be some time before access improves. This information appears to be held separately, with no link to related information on, for example, Ramsar sites, though in a number of cases the sites are designated for very similar reasons.

Common framework for protected areas information

All over Europe, indeed all over the world, protected areas have been established for very similar purposes, which meant that again and again those involved in managing sites and systems have had to "reinvent" ways to share and manage information. A common framework, or a set of commonly agreed guidelines, may be appropriate not only to assist at the national level, but also to improve the ability for easier sharing of information internationally.

Definitions, standards and criteria

There have been extensive discussions at the European and Global levels of what a protected area is, and numerous attempts to categorise protected areas. At the same time a number of different classifications have been used for the key features of protected areas, for example in the checklists included in the *Natura 2000* forms. Differences in classification, whether of protected area type or key features, hamper national policy setting and decision making, and render international comparison and priority setting more difficult.

7.2.4 Current Harmonization Initiatives

European Common Database of Designated Areas (CDDA)

During the early 1990s there were three separate programmes to compile information on protected areas in the European region. The European Environment Agency (and its precursor) were compiling information on European Union countries and a number of neighbouring countries, the Council of Europe was compiling information on the protected areas of the countries it represented, and WCMC was compiling information on behalf of IUCN and others.

In order to reduce duplication between the international organisations and secretariats and to reduce the burden placed on national agencies, the three organisations concerned agreed to work together on a Common Database on Designated Areas. This means that information for the relevant countries is compiled through collaboration, thereby avoiding separate requests to the countries or agencies concerned.

Currently data for nationally designated sites and sites covered by EC legislation are being compiled by ETC/NPB for the EEA, and data for internationally designated sites is being compiled by UNEP-WCMC. The information compiled on national sites is all being collected electronically over the Internet and UNEP-WCMC is reviewing digital boundary files it already has available with a view to developing future plans for joint compilation of boundary data. Additionally, a review is being made of how national agencies are currently managing their protected areas data and there is a discussion forum on the project on the EEA Website to facilitate the exchange of ideas and experiences.

Note that the CDDA is also a part of the European Nature Information System (EUNIS) discussed elsewhere in this report, and the World Database on Protected Areas discussed below.

The United Nations List of Protected Areas

Recognising the importance of protected areas, the UN Economic and Social Council adopted Resolution No. 713 (XXVII) in 1959, which called on IUCN to support the UN Secretary General in establishing a list of *national parks and equivalent reserves* in collaboration with UNESCO and FAO. This resolution was endorsed by the UN General Assembly at its Sixteenth Session in 1962. The *United Nations List of Protected Areas* has since been maintained by IUCN and UNEP-WCMC, and was last published in 1998. It is compiled from information provided by national agencies responsible for protected areas, and includes all sites that meet certain criteria established by WCPA. It is intended that the next edition of the list be compiled for the next World Parks Congress that takes place in September 2003.

Assessment of the state of the world's protected areas

Recognising the importance of an assessment of the world's protected areas in taking decisions relevant to implementation of the Convention on Biological Diversity, the CBD Conference of Parties meeting in the Netherlands earlier this year, in Decision VI/7, encouraged the CBD Secretariat to work closely with UNEP-WCMC and IUCN to facilitate development of this assessment. The intention is to develop an assessment that contributes both to discussion at the World Parks Congress in September 2003 (a once in ten years meeting of protected area professionals) and to the CBD Conference of Parties when it discusses protected areas as a key theme in 2004. This is another project led by UNEP-WCMC, with strong collaboration with WCPA.

World Database on Protected Areas

Since 1981 UNEP-WCMC and IUCN WCPA have been working together to collect and manage information on the world's protected areas. The information, compiled from both national and international sources, has been used for many purposes from assessment and priority setting to comparative analysis. Following a review of the database and its users, UNEP-WCMC is beginning to implement a new approach to the compilation of data and the delivery of information services, working in close collaboration with WCPA. The revised approach has three objectives:

- To provide, as a global resource, the *World Database on Protected Areas*, which: is an *accepted world standard*, comprising a defined core dataset of know quality, with data from identified sources; is *publicly accessible*, in formats useful to a wide range of potential users; and is *developed collaboratively* with protected area agencies and other appropriate organisations.

- To facilitate integrated access to all information on individual protected areas and protected area systems on the Internet, through: provision of a core dataset to which all other information can be

linked; development and testing of web-based tools that allow linking of other information to the core dataset; development and testing of tools and products that facilitate access to the core database and linked information; and promotion of the *World Database on Protected Areas* and as a world standard.

- To promote the use of the Internet to increase access to information on protected areas, by: encouraging protected area managers and system managers to make information available on the Internet; and fostering a co-ordinated approach to delivery of information services that naturally leads to a distributed information system on the worlds protected area systems.

The intent is to provide complete coverage of nationally and internationally designated sites, and to provide the interfaces and tools that allow both use and analysis of this information on line, and full access to other related data and information. This will require development of a coherent and effective strategy for linking the efforts of protected area managers and others in providing web-based information on protected areas, which will require significant planning and consultation. Implementation of such as strategy will require careful testing of various options and components, leading over time to delivery of a distributed database, drawing on national information sources wherein the data are managed by those who need the data for their own purposes.

The WDPA in both its current and future forms draws on and is part of the CDDA described above, and is the source of information for both the *UN List* and assessments of the world's protected areas.

Natura 2000 and the Bern Convention

The Natura 2000 Network is essentially a harmonization initiative to bring together site designations under both the EC Birds Directive and Habitats Directive. A single integrated questionnaire from has been developed. The work is currently being conducted by ETC/NPB to extend the harmonization further to incorporate the Bern Convention sites ("The Emerald Network"), particularly with the aim to introduce EU accession countries to the Natura 2000 process. A MoU is in place between the Council of Europe and the EEA in this regard, and Resolution 4 of the Bern Convention calls for co-operation and similar approaches. The Natura 2000 Network and Emerald Network have merged their software.

The key to Natura 2000 is the concept of "habitats" and ETC/NPB have a major programme to harmonize habitat definition and to select a workable subset derived from the earlier CORINE "biotopes" and habitat classification. Accession countries may propose new habitats, but these are reviewed by ETC/NPB for duplication and relative level of detail. Major projects are also underway through ETC/NPB on clarifying taxonomy and synonymy for instance the Flora (and Fauna) Europea projects. Note that much of this a part of the European Nature Information System (EUNIS) discussed elsewhere in this report.

Protected Areas Virtual Library

A pilot project is being conducted by UNEP-WCMC which aims to address the issue of improving access to existing information on protected areas that can be found on the Internet, ranging from sites managed by national authorities, to the information services provided by international conventions and programmes. The project seeks to identify key websites with protected areas information, select those with competent custodial practices, and to make available search engines and processes well suited to this specialised subject area.

Important Bird Areas

This programme, initiated by BirdLife International, is a world-wide project aimed at identifying, monitoring and protecting a network of critical sites for the world's birds. It is anticipated that up to 20,000 IBAs will be identified world-wide, using standard, internationally recognised criteria for selection. Many regional and national inventories have already been completed. The network of sites identified may be considered as a minimum essential to ensure the survival of key bird species across

their ranges, should a net loss of remaining habitat occur elsewhere through human, or other, modification. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national protected area programmes. It is also intended to assist the conservation activities of international organisations and to promote the implementation of global agreements and regional measures.

Global Review of Wetland Resources and Priorities for Wetland Inventory

Based on national wetland inventories a review of the global wetland resource was undertaken by Wetlands International, on behalf of the Bureau of the Ramsar Convention. Funding support came from the United Kingdom with complementary support provided through concurrent projects. The aims of the review were:

- to provide an overview of international, regional and national wetland inventories as well as other general information on global wetland resources;
- to outline steps to quantify the extent of global wetland resources and to provide a baseline for measuring trends in wetland conservation or loss; and
- to identify priorities for establishing, updating or extending wetland inventories so as to improve the accuracy with which the global wetland resource can be quantified and described in future.

The review concluded that global wetland inventory was incomplete and inadequate for most management purposes, and even where inventories existed they were often not widely available. A series of recommendations were made, with the aim of implementing an effective inventory programme world-wide as a basis for wise use of the global wetland resource.

Pan European Ecological Network

The Pan-European Biological and Landscape Diversity Strategy was approved by the European Ministerial meeting in 1995. The Strategy aims at promoting a more consistent (and thus more efficient) implementation of existing policies, initiatives, mechanisms, funds, scientific research programmes and information, in order to protect and further biological and landscape diversity in Europe. A key strand of this strategy is the development of a Pan-European Ecological Network, which will ensure that a full range of ecosystems, habitats, species and their genetic diversity, and landscapes of European importance are conserved.

The idea is that the work under the Strategy will provide a pan-European context for national action in implementation of protected area programmes, by helping to identify priorities and ensuring effective implementation of other existing international initiatives. The underlying philosophy is to promote synergy between the existing nature policies, land-use planning and rural and urban development.

In order to establish the Pan-European Ecological Network, the Council of Europe created a Committee of Experts for the development of the Pan-European Ecological Network, and this committee has met annually since 1997. Currently the work programme covers: raising awareness of decision-makers and the public and promotion of the integration in sectoral policies; setting up of trans-national, national, regional and local networks and their integration in the PEEN; training programme on the implementation of PEEN in CEEC and NIS countries; development of a synergy with existing initiatives and instruments; continued development of PEEN identification and methodology; and activities in support of threatened species and important areas for plants and for birds.

7.2.5 Recommendations

Strategic:

> ***Strategic recommendation 2.1: Support initiatives that lead to harmonization and streamlining of information management and reporting on protected areas and other key sites.***

Strategic recommendation 2.2: Encourage international protected area related agreements and programmes, including European regional initiatives, to make information available in a consistent and co-ordinated manner.

Strategic recommendation 2.3: Work to ensure that protected area related initiatives developed and implemented within Europe are managed in a co-ordinated and synergistic manner.

Strategic recommendation 2.4: Support initiatives that help identify international priorities for national action, so that policy decisions can be taken in the light of the best available information.

Practical:

Recommendation 2.1: Promote and support redevelopment of the World Database on Protected Areas, both as a source of basic quality-controlled information on protected areas, and as a standard catalogue of protected areas to which other information on sites and systems can be linked to facilitate access to the ever-broadening range of information available on protected areas.

Recommendation 2.2: Promote and support the Common Database on Designated Areas established by EEA, UNEP-WCMC and the Council of Europe, and encourage others working on protected areas information in Europe to collaborate rather than risk duplication of effort and adding to the burden of national agencies.

Recommendation 2.3: Promote the concept of protected area database rationalisation through the UN-mandated IUCN/UNEP-WCMC process at appropriate international fora. [The forthcoming CBD SBSTTA (2003) and COP (2004) meetings, with specific foci on protected areas, provide excellent opportunities for the Government to promote this approach, and to highlight its advantages for strengthening harmonized reporting in key conventions where protected areas are a feature.]

Recommendation 2.4: Encourage review of the nomination and reporting forms and processes for internationally recognised and designated sites, in order to assess whether there are opportunities for harmonization, synergy and streamlining of both the forms and the processes.

Recommendation 2.5: Encourage international agreement and programme secretariats to make all information available over the Internet, and promote and support development of co-ordinated and integrated access to this information to facilitate wider understanding of the relationship between the different initiatives and the ways in which they support nature conservation.

Recommendation 2.6: Consider supporting a stakeholder workshop specifically to review the availability of information relevant to protected areas and protected areas management, and the need for such information at national and international levels, with a view to contributing to the international debate on protected areas in the context of the World Parks Congress in 2003 and CBD discussion on protected areas in 2003 (SBSTTA) and 2004 (COP).

Recommendation 2.7: Consider supporting a stakeholder workshop to review the information available on international site networks and their associated initiatives, with a view to assessing the adequacy or otherwise of the information provided and making recommendations that will contribute to the international debate on protected areas in the context of the World Parks Congress in 2003 and CBD discussion on protected areas in 2003 (SBSTTA) and 2004 (COP).

Recommendation 2.8: Support agreement on a metadata standard for wetland inventories at the Ramsar Convention Conference of Parties, and encourage the Ramsar Convention to support development of a clearing-house for such inventories.

Recommendation 2.9: Encourage the EC/EEA to make information on sites in the Natura 2000 network available on the Internet, and to explore with other organizations how to relate this information to other internationally managed datasets such as the Ramsar database.

Recommendation 2.10: Support efforts by BirdLife International to increase access to information on Important Bird Areas through the Internet, and encourage them to explore ways to link this data to other related datasets such as the Ramsar database and information on birds covered by international legislation.

7.3 CLUSTER 3 - DEVELOPMENT PROJECTS AND OTHER DONOR INFORMATION

7.3.1 Introduction

This cluster discusses information services that list or provide information on the status of nature conservation development projects, and/or information on international policies and priorities for funding of donor projects (multilateral and bilateral).

In total there are 18 information sources in the Reference Guide, and the following are the key sources:

- Asian Development Bank Website
- Global Environment Facility - Project Information
- OECD - Development Assistance Committee
- United Nations Development Programme Website
- World Bank - Projects & Operations Database

7.3.2 Players

The principal players in this cluster include:

- *Development Banks and funding mechanisms:* The World Bank and the Global Environment Facility are key information sources. Of the regional development banks, the Asian Development Bank has the most useful information available online on active donor projects.

- *UN agencies:* Particularly important are those that actually deliver donor on-site projects, hence the UNDP in particular. Both UNDP and UNEP are key in the biodiversity sector as implementing agencies (with the World Bank) of the GEF.

- *Other Intergovernmental agencies:* These include regional and global organisations and bodies of which the OECD Development Assistance Committee (DAC) is the most relevant and active in information co-ordination, compilation and provision.

- *Bilateral aid agencies:* In this regard the UK Department for International Development (DfID) is the most relevant to this study, although all major bilateral aid agencies may hold regional assessments and project information of value. Also relevant may be their priorities and policies, and their expertise.

- *International NGOs:* Most relevant to this study are WWF, the Nature Conservancy, Conservation International and IUCN (particularly their regional and country offices).

7.3.3 Issues and Concerns

The major issues are the following.

- Vast amounts of development aid are provided by bilateral and multi-lateral donors every year. A portion of this is aimed at "environmental" projects some of which relate to nature conservation (or biodiversity). It is difficult at the current time to determine the extent of such aid or obtain a synthesis of general objectives or trends.
- Regional and national assessments of needs and priorities are conducted by major donors, often independently and redundantly. Increased sharing of information and experiences may lead to far more efficient use of resources.
- Aid programmes and projects in different sectors may have conflicting goals and impacts - even if conducted by a single donor (e.g. infrastructure development that has negative impact on biodiversity) Improved information sharing would open opportunities for collaborative projects.

In order to address these issues and concerns it is therefore imperative to be able to obtain a more complete picture of donor project spending and priorities, and use this information to rationalise development programmes and priorities, and bilateral and multilateral development assistance.

This need has been reflected in the most recent CBD COP Decision VI/16 that contains *inter alia* the following provisions:

> *"Invites parties and Governments, funding institutions and development agencies ... to communicate to the Executive Secretary their funding procedures, eligibility criteria and programme priorities in relation to biological diversity."*

and

> *"Urges parties and Governments, the World Bank, the International Monetary Fund, The United Nations Development Programme and other relevant institutions to take concrete actions to review and further integrate biodiversity considerations in the development and implementation of major international initiatives ..."*

7.3.4 Current Harmonization Initiatives

There are currently few significant programmes aimed at harmonizing, integrating or making more easily available coherent and consistent information on donor activities and projects related to nature conservation.

Global Environment Facility

The GEF and the implementing agencies are closely co-operating in the provision of information on GEF-funded projects and programmes and their websites are closely linked and cross-referenced. Each implementing agency has a specific area of their website dealing with GEF issues and projects. In co-operation with UNEP, GEF has developed a Project Tracking and Mapping System that enables project information searches by key project parameters. Further enhancements are being developed. This database covers projects that are being implemented by all three implementing agencies and is being kept up-to-date despite the date noted on the entry screen.

CBD Clearing-House

At the moment there is no significant integration (or attempt at integration) across bilateral donors, even the major players, like US-AID, GTZ, DfID, Ausaid, CIDA, SIDA, DANIDA, etc., or across EU countries concerning support for biodiversity-related issues.

The recent CBD COP Decision VI/16 requests the Executive Secretary:

> *"In collaboration with the Global Environment Facility, to promote co-ordination, coherence and synergies in financing for biological diversity amongst donor parties and governments, bilateral, regional and multi-lateral funding institutions and development agencies in order to avoid duplication of work, identify gaps in activities...*
>
> *"in consultation with the Global Environment Facility, to make available through the Clearing-House Mechanism relevant funding information including success stories and best practices...*
>
> *"to explore possible co-operation with relevant institutions to address the need for centralising information on biodiversity related activities of funding institutions and other donors."*

Apart from identifying the Clearing-House Mechanism as the focal point for such an exercise, no functional plans are yet in place towards achieving this desired integrated information source.

Donor Information Sharing Project

This project was a collaboration between UNEP-WCMC and DfID, with the objective to foster co-ordination and collaboration among donors working to reverse trends in degradation of natural resources and conserve biodiversity, by promoting the sharing of project information among donors, and with a wider public. The project has included all foreign aid projects related to forests, natural resources and rural livelihoods and uses interactive map technology for user access. The interactive map shows the locations of projects supported by the participating donors and links to the project summary and contact information held either at UNEP-WCMC or by the donors themselves. It also includes mapped information on environmental and development contexts for the projects.

DISP was essentially a pilot project to demonstrate the concept and feasibility, and as such was successful in integrating information from multiple sources and displaying it graphically. There are current plans to extend the project to a wider base of donors, for instance by incorporating the information from the OECD DAC, and the EC Development Directorate General (This DG Development site currently allows selection of EC environmental development projects by country and region).

Development Assistance Committee

The OECD/DAC monitors financial flows and their allocation with the aim of supporting the needs of policy-makers in the field of development co-operation, and to provide a means of assessing the comparative performance of aid donors. The DAC Statistical Reporting Directives (OECD/DAC (2000)10) explicitly define "Aid to Environment" and requests under this category, *inter alia,* information on donor activities. However, only summary information is captured and projects under this heading may range from sustainable forestry to waste management.

In addition the DAC website provides links to the websites of each of its 24 members, although there is no attempt to provide search tools across these sites, and we are not aware of any initiative to co-ordinate delivery of information relating to development assistance through websites.

Country Profile Access

Recognising that there is significant duplication of effort in the preparation of country profiles by development assistance agencies and others, UNEP-WCMC has initiated a project to provide easier access to all of the existing country profiles that contain biodiversity related information that are available over the Internet. UNEP-WCMC is exploring ways to develop this concept further working with those who regularly use such information in both the development and industry sectors.

7.3.5 Recommendations

Strategic:

> ***Strategic recommendation 3.1: Support moves to provide consolidated access to information on bilateral and multi-lateral assessments and donor projects with the intention of rationalising nature conservation aid delivery, reducing "competition" between donors, and increasing collaboration and effective targeting of priorities within the aid community as a whole.***

Practical:

> ***Recommendation 3.1: Encourage DfID to work with UNEP-WCMC to review their joint work under the Donor Information Sharing Project with a view to exploring how the project might be expanded to incorporate information from, and respond to the needs of, other bilateral and multilateral development assistance agencies.***

> ***Recommendation 3.2: Through the CBD Secretariat, support in principle and push for the development of a practical work plan to implement the requests set out in COP 6 Decision VI/16 as regards incorporating donor information in the CBD CHM, taking into consideration both the DfID funded Donor Information Sharing Project and the needs and interests of the GEF and OECD/DAC.***

> ***Recommendation 3.3: Encourage European agencies such as the EC DG Development to collaborate with these integrating and consolidating initiatives rather than duplicate efforts.***

> ***Recommendation 3.4: Encourage the OECD Development Assistance Committee to consider further the issue of compilation and sharing of information on biodiversity-related aid in the context of, inter alia, CBD COP Decision VI/16.***

> ***Recommendation 3.5: Encourage OECD Development Assistance Committee to work with other appropriate organisations to co-ordinate access to information on donor policies, both thematic and geographic, to facilitate co-operation in donor support.***

> ***Recommendation 3.6: Encourage UNEP-WCMC to continue work on co-ordinated access to country studies and profiles, while ensuring through stakeholder consultation that this work is fulfilling a real need.***

7.4 CLUSTER 4 – CLEARING-HOUSE MECHANISMS AND INFORMATION EXCHANGE NETWORKS

7.4.1 Introduction

In this cluster we discuss information services that are identified as "clearing-houses" or serve that sort of purpose, that is, facilitate the exchange of nature conservation information between members of a network, or are broadly open to all.

In total there are 29 information sources in the Reference Guide, and the following are the key sources:

- Biodiversity Conservation Information System (BCIS)
- Convention on Biological Diversity – Clearing-House Mechanism
- European Environment Information and Observation Network (EIONET)
- European Community Biodiversity Clearing-House
- European Topic Centre on Nature Protection and Biodiversity
- Global Biodiversity Information Facility
- Pan-European Ecological and Landscape Diversity Strategy Guide

7.4.2 Players

In conducting this project, 29 separate services were identified that call themselves a "Clearing-House" or provide for means of exchanging nature conservation information amongst partners. The services are operated by governments, NGOs, inter-governmental organisations and convention secretariats. In addition to those listed in the Reference Guide, nearly all the biodiversity related convention secretariats operate services that are in part a clearing-house, as do many regional NGOs.

The most active and relevant are the CBD Clearing-House Mechanism and the related regional and national clearing-houses established in response to the CBD. Of the regional nodes the EC Biodiversity Clearing-House is both the most active and most relevant to RINCIS. The UK, Belgian, Italian and German clearing-houses are among the most active and useful in the European Context.

In the international NGO community, the Biodiversity Conservation Information System (BCIS) operates in part as a clearing-house to share conservation information between the 10 partner organisations. It aims to provide an open forum "knowledge management" facility that so far is little developed, and is working towards a "biodiversity commons" concept that may be significant in the future.

A number of more specialised services are active and useful in a narrower context such as the Global Forest Information System, GRID-Arendal Biodiversity in Central and Eastern Europe, UNEP-Caribbean Environment Programme, the embryonic Biosafety Clearing-House and Global Invasive Species Programme, and various species-related and taxonomic information services.

UNEP not only is closely linked to the CBD CHM, but fosters clearing-houses (in effect) through its regional programmes - Caribbean, Asia and Pacific, South pacific Regional Environmental Programme (SPREP), Mediterranean Action Plan (MAP) etc. Also of interest is the development of UNEP.Net, a focus for access to UNEP managed information sources and datasets.

The Global Biodiversity Information Facility (GBIF) is at early stages, but intends to be a major clearing-house for taxonomic information and specimen collection resources. (See Cluster 8)

Within Europe the EEA is the principal sponsor and conduit for information sharing and exchange - not only through the EC Biodiversity Clearing-House, but also through EUNIS, EIONET and the EEA Data Service.

7.4.3 Issues and Concerns

The major issues are the following.

- The original intent of the CBD CHM was to facilitate "scientific and technical" collaboration - that is, to promote collaboration resulting in the sharing of techniques and technology to assist with biodiversity conservation. This was intended particularly as a "North-South" exchange to make available higher technologies for the sustainable use of biological resources. To-date the CBD-CHM has largely emphasised sharing of information on national measures to implement the Convention (action plans, policies and the like), and the intended technology transfer is not occurring.
- Many national CHMs have taken time to develop under the CBD because of a confusion of priority and purpose. Also, a lack of consistent leadership has meant that a variety of models have evolved.
- It is not at all certain that there is much value to "harmonization" of various clearing-house and de facto clearing-houses. Rather the issue is rationalisation and linkages. The large number of broadly-based information networks means that on the one hand there is considerable duplication of information content and on the other hand no clear "one stop shop" for nature conservation information exchange. Rationalisation of the scope of various services along with clarifying the links would be beneficial.
- Technology for the Internet is evolving very rapidly, especially in the area of database (and spatial database) interoperability, and automation of linkages. This presents difficulties for near future harmonization as today's "standard" may soon be superseded.
- Expanding open-ended clearing-houses requires considerable effort to ensure consistent quality. With increasing volume and automation it becomes impossible to ensure that all resources are up-to-date or are "vetted" for content and quality. International organisations traditionally greatly underestimate the resources (technical and human) required to effectively maintain a clearing-house site.

7.4.4 Current Harmonization Initiatives

CBD – Clearing-House Mechanism

The Convention on Biological Diversity has established a "clearing-house mechanism" to ensure that all governments have access to the information and technologies they need for their work on biodiversity. The clearing-house is co-ordinated by the Executive Secretary and overseen and guided by an Informal Advisory Committee (IAC) set up by the Parties to the Convention. In addition, a network of national focal points for the mechanism is being established to address matters relating to technical and scientific co-operation at the national level, and to liase with the global CHM. The clearing-house seeks to increase public awareness of Convention programmes and issues. It is establishing an Internet-based system to facilitate greater collaboration among countries through education and training projects, research co-operation, funding opportunities, access to and transfer of technology, and repatriation of information. Through the CBD SBSTTA, IAC and informal meetings of various kinds national and regional clearing-houses establish a degree of harmonization in approach and content.
This process will continue with the development underway of more specialised thematic clearing-houses, such as the Biosafety Clearing-House, and the Global Invasive Species Programme.

Inter-American Biodiversity Information Network (IABIN)

The Inter-American Biodiversity Information Network is a recent intergovernmental initiative to promote greater co-ordination among Western Hemisphere countries in collecting, sharing and using environmental information. IABIN is an initiative of the Summit of the Americas on Sustainable Development and was mandated as Initiative 31 of the Action Plan resulting from the December 1996 Summit in Bolivia. The Inter-American Committee on Sustainable Development (CIDS) of the Organization of American States endorsed IABIN in a resolution passed in October 1999. As of

August 2001, twenty-six countries in the Americans have designated official IABIN Focal Points to co-ordinate national efforts to implement the network.

IABIN works closely with other regional and global biodiversity information networking initiatives, including the Global Biodiversity Information Facility, the North American Biodiversity Information Network, and the Clearing-House Mechanism of the Convention on Biological Diversity. IABIN will continue to establish co-operative linkages with other regional and global initiatives such as GBIF

BCIS

BCIS has posted on their facility some general guidelines for information management that provide a framework for consistency and harmonization. As noted above, however, there is currently little content available through BCIS and no effective moves to harmonization, although proposals are being developed. A related project the Species Information System is under development (led by the leadership of the IUCN Species Survival Commission) that seeks to support the needs for information on threatened species across the BCIS members (see Cluster 7). Harmonization to establish interoperability within SIS and BCIS will be required, but directions here are as yet unclear.

UNEP.Net

The United Nations Environment Programme has announced a new integrative programme called UNEP.Net, that is intended to be the principal mechanism for dissemination of UNEP related information - replacing and unifying UNEP-GRID, Infoterra, and drawing on the information dissemination activities of UNEP-WCMC, GRID-Arendal etc. UNEP.Net is essentially a set of technical protocols and standards that allow for interoperability of data services (rather than centralising them) with particular emphasis on map referenced data. Several pilot examples are now operating through UNEP-WCMC and GRID-Arendal. The broad-brush integrative objectives are extremely ambitious and since there is not specific funding the UNEP.Net it will have to evolve incrementally as particular projects opportunities arrive to apply the consistent technology standards. It should be emphasised that the harmonization concerns the technicality of interoperability - not the harmonization of information content or semantics.

PEBLDS Strategy Guide

While not a harmonization initiative in the strict sense, the Strategy Guide Website maintained by ECNC aims to draw together information from a wide range of sources concerning implementation of the Pan-European Biological and Landscape Diversity Strategy. As this is a broad-ranging strategy with many players at both the national and international level, such a service is important in trying to achieve a degree of harmonization and co-ordination in strategy implementation.

7.4.5 Recommendations

Strategic:

> ***Strategic recommendation 4.1: Promote the rationalisation and concentration of focus of clearing-houses and other information exchange facilities.***

> ***Strategic recommendation 4.2: Encourage nature conservation clearing-houses to provide increased access to the science, technologies and methodologies, rather than simply to documentation and data.***

Practical:

> ***Recommendation 4.1: Encourage and support the further development of the CHM managed by the CBD Secretariat, in particular promoting moves towards an increased role in technical and scientific collaboration, and increased linkages between the CHM and implementation of programmes of work agreed by the COP.***

Recommendation 4.2: Encourage and support the development of focussed thematic nodes of the CHM as defined in COP Decision V/14 closely linked to the needs of the Convention programmes (both current and future) including active consideration of the ways in which UK-based agencies might contribute.

Recommendation 4.3: Support and actively participate in meetings of CHM National Focal Points aimed at sharing experience and increasing collaboration between countries in delivering the CHM.

Recommendation 4.4: Encourage and support the actions of the European and UN agencies and others in seeking to make available publicly through user-friendly interfaces their information holdings, and where possible assist them in this process.

Recommendation 4.5: Using the Reference Guide as a starting point commission a research project with agency (preferably international) and NGO participation that develops guidelines for effective management and quality control of nature conservation information exchange systems, and for their adequate and stable funding.

Recommendation 4.6: Encourage NGOs and international agencies to focus closely the scope of information exchange facilities, to avoid duplication of existing services, and to link to national, regional and global "official" CHMs (noting the potential for greater UK influence and direction for rationalising information exchange and ensuring good linkages with the UK Biodiversity Clearing-House Mechanism.

7.5 CLUSTER 5 – ENVIRONMENTAL LAW

7.5.1 Introduction

This cluster includes information services that provide access to or reference to international and national environmental law, especially related to MEAs, EC legislation and related national implementing laws. Also included are services that provide policy analysis, commentary, advice and capacity building in international environmental law.

In total there are 14 information sources in the Reference Guide, and the following are the key sources:

- ECOLEX
- EUR-Lex Portal
- FAOLEX
- IUCN – Environmental Law Information Service

7.5.2 Players

The main players involved in the provision of materials on international law are the IUCN-Environmental Law Centre, United Nations Environment Programme (UNEP), Food and Agriculture Organization (FAO) and the European Commission. In addition, information on international environmental treaties is generally available on the websites of Convention Secretariats. The Consortium for the International Earth Science Information Network (CIESIN) and its related Socio-economic Data and Applications Center (SEDAC) also offer search facilities for international environmental treaties.

IUCN/UNEP

In the 1960s the IUCN Environmental Law Centre (ELC) located in Bonn, Germany created an all encompassing information system on environmental law (ELIS). ELIS evolved into a large set of references to treaties, national legislation, soft law and legal literature, linked to documents held in the libraries of the ELC for the IUCN Environmental Law Programme. The ELIS databank is one of the largest and most comprehensive collections of environmental law and policy, and ECOLEX draws upon this material.

The UNEP Computerised Environmental Law Information Base (CELIB) located in Nairobi, Kenya contains the texts/abstracts of and information on many environmental conventions. It provides the full texts of the material indexed in ECOLEX.

In 1995 the Governing Council of UNEP issued a mandate for the two organisations to join forces in order to provide a comprehensive global source of information on environmental law. The IUCN Environmental Law Centre hosts ECOLEX and has taken primary responsibility for its operation, under the direction of a steering committee.

FAO

FAOLEX is a computerised database of national legislation and international agreements concerning food and agriculture (including fisheries, forestry, water, environment, land, plants, water and wildlife). Most of the treaties, laws and regulations come from the official gazettes of Member States. FAOLEX includes the full text and also an abstract for each text.

European Commission

European legislation is available through EUR-Lex, which is an internet service of the European Union providing a single entry point to the complete collections of EC legal texts as found in CURIA, CELEX and the official document repositories managed by EUR-OP. There is currently no obvious link between EUR-Lex and ECOLEX.

Convention Secretariats

Many of the relevant MEAs include full text of the treaty and related resolutions and decisions. These may be more up-to date than ECOLEX (especially with regard to Party status) as there is no process that automatically communicates changes to ECOLEX. The CBD Clearing-House Mechanism and Joint Convention Website attempt to provide access to legal texts of a number of conventions. This is not co-ordinated with ECOLEX.

CIESIN and SEDAC

The Consortium for the International Earth Science Information Network (CIESIN) metadatabase service and its related Socio-economic Data and Applications Center (SEDAC) offer search facilities for international environmental treaties (interpreted broadly to include resources, law-of-the-sea, human rights, etc). The information for some or all of this service is apparently supplied by IUCN-ELC, but it is not clear what the relationship is to ECOLEX and whether the two sets of information are synchronised.

7.5.3 Issues and Concerns

- No organisation is specifically mandated to provide a comprehensive global source of information on a range of environmental legal material, including multilateral and bilateral agreements, national legislation, international "soft law" documents, and law and policy literature.

- National, regional and global organisations in some cases overlap in scope and intent, but differ in timeliness and completeness.

- Current attempts at harmonization (largely through ECOLEX) seem to be *ad hoc* and there is a lack of funding for improvement of maintenance systems and technology.

- There would appear to be considerable duplication of effort in the provision of information on international law. Although efforts are currently being made to incorporate into ECOLEX texts and information held by FAOLEX, relevant information is also held by other bodies and supplied by other information services, e.g. EUR-Lex, convention secretariats, CIESIN and SEDAC.

- The current facilities for the searching and the delivery of material are not very "user friendly" and seem to reflect the lack of a user needs study that has considered the requirements of national policy-makers or MEAs.

7.5.4 Current Harmonization Initiatives

At the centre of integration of access to environmental law information is ECOLEX, initially a collaboration between IUCN and UNEP as described above. It is an Internet-based information system providing access to basic legal information on environmentally-relevant international agreements. The project was initiated in 1997 to provide a single gateway to legal instruments and materials related to environmental management. It is hosted by the IUCN's Environmental Law Centre in Bonn.

The Role of ECOLEX

Over the past thirty years there has been a significant growth in multilateral and bilateral agreements, national legislation, international "soft law" documents, and law and policy literature, as well as related jurisprudence and court decisions. However, much of this information is difficult to access, even for those whose profession it is to develop and implement national legal mechanisms in the field. There are two reasons for this:

- there is limited knowledge about the existence and location of this information; and
- even when this information is available, access is limited.

This is particularly the case for governments and civil societies in developing countries and countries with economies in transition, where government officials, practitioners, environmental managers, non-profit institutions and academia lack easy access to the legal information they need for developing the necessary legal tools to promote environmental management. The purpose of ECOLEX is to build capacity world-wide through providing the most comprehensive global source of information on environmental law as is possible.

Scope of ECOLEX

There are several ways in which an international agreement can be found. Firstly it is possible to look for a specific convention by searching for its exact title. It is also possible to search by subject, keyword, country, place of adoption, date of adoption, field of application, depository or by using free text. (Potentially relevant conventions are listed in chronological order.)

For each convention, ECOLEX provides the following:

- The text of the agreement and a summary of its provisions.
- Basic background information is provided about the legal instrument, including:
  - the subjects covered by the convention;
  - the field of application;
  - original language;
  - translation languages;
  - place of adoption;
  - date of adoption;
  - where the text can be located;

- number of pages;
- number of pages of appendices;
- date of entry into force; and
- depository.

- Identifications and links to related conventions, e.g. other conventions that cover a particular field of study, or other conventions for which the depository also acts as depository, or other conventions adopted in the same place.
- A treaty status matrix.
- Literature references relevant to each convention/agreement.
- References to national legislation, which implements or is otherwise relevant to the particular convention (although only summary information is provided.
- Keywords are included for each convention, and it is possible to link to other conventions that share a particular keyword.

Current Limitations of ECOLEX

- If a search is conducted by country (thereby producing a chronological list of all conventions to which that country is a party), it is not possible to further narrow the search. For example, once a list of all conventions to which the United Kingdom is a Party has been generated (currently a list of 265 entries), it is not possible to further refine that search in order to produce a list of all conventions signed by the UK which are relevant to marine resource conservation.

- ECOLEX does not provide links to the websites of convention secretariats, or to other related information outside its own databases..

- Texts of national legislation are currently not available. ECOLEX does provide references to national legislation, but the actual texts must be obtained from other sources.

- European Community legislation is not available through ECOLEX.

- References to relevant literature are provided, but texts or links to other websites containing the text are not included.

- ECOLEX was last updated in May 2000. If the information held by one of the partner organisations is updated, ECOLEX does not update automatically. Rather updating ECOLEX is done manually in the sense that a positive process of updating is required. Consequently ECOLEX is somewhat out of date, particularly as regards the information recorded in the treaty status matrix of some conventions.

- Although the first stage of development was funded by the Government of the Netherlands, currently there is no funding for ECOLEX. This is obviously a considerable restriction on the development of the database. The ECOLEX partners have begun fundraising efforts in order to further develop and improve the service.

Proposed Future Developments of ECOLEX

- The IUCN is currently in the process of updating ECOLEX. A new collection of data has been prepared and is awaiting incorporation. IUCN is simultaneously working on a revision of the presentation of the data, and it is hoped that the new information will be available early in 2002.

- In 2001 the IUCN entered into a Memorandum of Understanding with UNEP and FAO to expand the operation of ECOLEX. Under the Memorandum of Understanding, information from FAOLEX is to be incorporated into ECOLEX. To date the integration of FAOLEX into ECOLEX has been addressed only as regards technical matters and commonalities, such as a common keyword catalogue, subject areas, etc. The incorporation of the legal material held by FAOLEX is still to take place.

- The full text of national legislation will be available in the future. FAO is to be responsible for providing the texts of national legislation.

- In the future European Commission legislation will be available on ECOLEX. The FAO will be responsible for providing the texts of national legislation and, since FAO classes European legislation as national legislation, the texts of European Commission legislation will also be included. However, as noted above, the incorporation of legal material held by FAOLEX has not yet taken place.

- Further expansion of the scope of coverage of ECOLEX is planned, e.g. input from IUCN Regional and/or Country Offices, IUCN Centres of Excellence, and other information centres and data custodians.

- Further partnerships are being sought, particularly with the private sector.

Long-term Objectives of ECOLEX

In this context, the stated long-term objectives of ECOLEX in building capacity world-wide are as follows:

- Maintain, refine and develop the environmental law database and its related information and resources;
- Present this data in a user-friendly format, facilitating searches for references and full texts through the development of multilingual retrieval possibilities (English, French, Spanish);
- Provide global access to the database in an efficient and cost-effective manner;
- Address the special needs and access problems of users in developing countries and countries with economies in transition;
- Develop a distributed network of associates, at regional and national level;
- Develop special ECOLEX products and services aimed at increasing knowledge and building capacity in environmental law at the local, national and regional levels;
- Expand the consortium of partners of ECOLEX and conclude appropriate formal arrangements memorialising these relationships; and
- Market ECOLEX in the private sector.

7.5.5 Recommendations

Strategic:

> ***Strategic recommendation 5.1: Support efforts to rationalise further environmental law information holdings, thereby making it possible for policy-makers and others to obtain access to relevant information on international, European and national legislation through one integrated service.***

> ***Strategic recommendation 5.2: Support in principle that ECOLEX should be mandated to develop as the principal global provider of environmental legal information, collaborating with and drawing on other information sources (such as EUR-Lex) as appropriate.***

Practical:

As noted above, Convention secretariat websites frequently maintain treaty text, formal decisions that are currently in effect; and lists of Parties with dates of signature, ratification, accession and/or entry into force. In addition the Parties to conventions are often required to identify (either in their periodic national reports or whenever changes occur) national implementing legislation (e.g. CMS, AEWA, Bern Convention, EC Birds Directive, EC Habitats Directive and IWC). This duplicates information that, in principle, is held by ECOLEX. The agreement whereby EC (and national) legislation will be

passed to EUR-Lex by FAO seems to be round-about and potentially inefficient. Direct connections between EUR-Lex and ECOLEX and direct capture of national legislation through convention reporting procedures would seem to be far preferable.

Recommendation 5.1: Support a pilot project in the context of harmonization of national reporting that examines how legal information requested by treaty secretariats could routinely be linked to ECOLEX and made available through this central source, eliminating the need for duplicate maintenance and update.

Recommendation 5.2: Encourage MEA secretariats to collaborate in delivering legal information (texts, decisions, party lists, national implementation) in a consistent manner with the aim of moving towards a more distributed approach to the management of ECOLEX.

Recommendation 5.3: Support (through direct funding or encouragement of UNEP, EEA and IUCN) steps to improve the functionality and search capacity of ECOLEX, as well as promoting a full user-needs assessment of ECOLEX as a key stage in its future development.

Recommendation 5.4: Support through the European Commission the development of stronger linkages and reduced duplication between ECOLEX and EUR-Lex to ensure that EC legislation is available through ECOLEX (recognising that the best option would be technological linkages that would have EUR-Lex maintain the information with automated links to ECOLEX).

Recommendation 5.5: Consider supporting a workshop to consider how the information available on national legislation implementing CITES in each country can be made easily accessible and current to support customs officials in their work.

7.6 CLUSTER 6 - GLOBAL AND REGIONAL LONG TERM ECOLOGICAL MONITORING

7.6.1 Introduction

This cluster deals with information sources that provide databases and data-sets on long-term ecological monitoring, networks intended to assist, and related information on policies, standards and protocols.

In total there are 24 information sources in the Reference Guide, and the following are the key sources:

- Biosphere Reserves Integrated Monitoring (BRIM)
- GTOS – Terrestrial Ecosystems Monitoring Sites (TEMS)
- International Long-Term Ecological Research Network (ILTER) Website
- Natura 2000 Network

Long-term monitoring involves making standardised observations in a number of designated sites over a period of time to enable evaluation of changes against a given baseline. It may involve measurements of only a few selected variables for a specific objective or it may be more general in

nature using multiple variables. Although historically, the emphasis has been to establish networks of sites for scientific research purposes, there is now increased effort to include:

i) measurement and integration of socio-economic components, and
ii) analysis and comparison to produce findings relevant to policy-related needs.

The long-term datasets that are the immediate outputs of the long-term monitoring activities are essential tools for policy-makers:

i) to provide understanding of the nature of environmental change and thus allow development of appropriate policies in a timely fashion, and
ii) to evaluate the effectiveness of policies and measures in place.

7.6.2 Players

Long term monitoring of the environment is undertaken by governmental bodies at all levels, from local community to global, by NGOs and through volunteer programs. At the global level, it was one of the early cornerstones of UNEP and its "Earthwatch" concept. Shortly after the inauguration of UNEP, the Global Environmental Monitoring System (GEMS) was formed and became one of the primary Programme Activity Centres of UNEP. GEMS had components that monitored air, water, radiation, health (as related to the environment) and terrestrial ecosystems. The latter spawned the Global Resource Information Database (GRID) project that evolved into a number of regional centres using remote sensing and Geographic Information System technology to accumulate information on land cover and to provide capacity building at regional and national levels. In the 1990s however, GEMS was dismantled, devolved to more specialised agencies to some extent, with the formation of three linked "observing systems" – Global Ocean Observing System (GOOS), Global Climate Observing System (GCOS) and the Global Terrestrial Observing System (GTOS). The first two of these have clear focus – GOOS under IOC, and GCOS under WMO linking to Climate Change Convention activities. The three observing systems collaborated (through the Joint Data and Information Panel) to establish an Information Centre, GOSIC, hosted in the University of Delaware, with the intention of making "G3OS" datasets available easily.

FAO/GTOS

GTOS was placed under FAO with a very broad mandate – to provide the scientific and policy-making community with access to the data necessary to manage the change in the capacity of terrestrial ecosystems to support sustainable development. One specific GTOS product is the Terrestrial Ecosystem Monitoring Site (TEMS) database. Building from initial work in GEMS, this is now a web-accessible system containing information (primarily metadata) on over 800 sites that carry out long-term monitoring activities. The website allows users to query and browse through a variety of access paths and allows site managers to update their information directly. In partnership with other on-going programmes, GTOS has also established two regional programmes (South Africa and Eastern Europe) and two thematic initiatives (estimation of Net Primary Productivity and Terrestrial Carbon Observations).

ILTER

The International Long Term Ecological Research network (ILTER), hosted by the US is another significant player at the global level. ILTER builds upon existing efforts and its primary function is to bring together existing national networks of sites or, if such things do not exist, to develop the networks. Within the UK the Environmental Change Network (ECN) is a participant in ILTER.

UNESCO- MAB

The Biosphere Reserve Integrated Monitoring Programme (BRIM) is part of the UNESCO Man and Biosphere activities and is intended to be the core information service for MAB. The base data is assembled though monitoring activities in the World Network of Biosphere Reserves. Although the

emphasis has been on measurement of biodiversity-related parameters, BRIM is presently being expanded to also include analysis of abiotic and socio-economic issues.

Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment is an international four-year process that commenced in April 2001. It is intended to increase the quality and quantity of policy-relevant scientific information concerning ecosystem change and human well-being. It is particularly (but not exclusively) aimed at the needs of policy-makers involved in the ecosystem-related conventions. It is being conducted through collaboration between a number of agencies, including UNEP, GEF, WRI, and FAO. UNEP-WCMC will serve as the primary data co-ordinator. Details of data and information handling are expected to be finalised in August 2002.

GRID-Arendal

GRID-Arendal (Norway) was originally one of the GRID regional centres mentioned above and is now a UNEP co-operating centre. It is very active in assembling monitoring and state-of-the-environment information, with specific responsibilities for selected regions – the Arctic, Baltic and Eastern Europe. The first of these – the Arctic – is particularly of interest with respect to detection of environmental change and GRID-Arendal is able to provide a range of both metadata and thematic datasets relating to the status of the Arctic environment.

Europe

Within the EU, Natura 2000 is a network of sites (Special Protection Areas (SPA) and Special Areas of Conservation (SPC)) designated by Member States under the Birds Directive and the Habitats Directive respectively. This latter relates to implementation of the Bern Convention in the EC. The Emerald Network (Areas of Special Conservation Interest) is intended to serve the Convention and covers the whole of Europe and part of Africa. It appears that the SACs of Natura 2000 will become Areas of Special Conservation Interest (ASCIs) of the Emerald Network (see Cluster 2). This will ensure a coherent network of sites for the whole of Europe.

The United Nations Economic Commission for Europe has a group of six specialist International Co-operative Programmes (ICPs), one of which is the multidisciplinary Integrated Monitoring Programme (ICP-IM). Measurements are taken in a network of sites located in natural or semi-natural areas in 21 European countries.

National

National monitoring networks are the basis of many of the activities that have been mentioned at the global and regional levels. In the UK itself, long term ecological monitoring at the national level is undertaken through the Environmental Change Network (ECN) co-ordinated by the Centre for Ecology and Hydrology (CEH). ECN uses a network of monitoring sites across the UK where regular measurements related to the state of the ecosystems are made, using standard protocols. ECN has built considerable strength in data management and the data is assembled and maintained centrally and can be quickly disseminated in a variety of forms, as required to serve the needs of a range of users. The Network is a multi-agency initiative with the actual sites being the responsibility of different agencies. ECN itself does not monitor socio-economic variables but is increasingly linking with other UK survey and monitoring programmes to produce integrated analyses intended for both research and policy making. ECN is also active at the regional and global levels:

- it is part of ILTER
- it co-ordinated the EC Preparatory Action on "Networking of Long-term Integrated Monitoring in Terrestrial Systems" (NoLIMITS), the main output of which was a strategic plan for the creation of a European network of sites for long-term policy-relevant monitoring and assessment
- it has established active links with GTOS e.g. in developing one of the regional initiatives, and is currently contributing to the Net Primary Productivity demonstration project.

In summary, the ECN presents a good model of a long term monitoring network, is well-regarded by peers, and is active is addressing the overall issues associated with monitoring and assessment activities.

Other well-developed national networks include the United States Long Term Ecological Research Network and, in Canada, the Ecological Monitoring and Assessment Network (EMAN). US-LTER is funded by the US NSF and, as noted above, hosts ILTER. EMAN links the many groups and individuals involved in ecological monitoring in Canada and its creation was facilitated by Environment Canada through a Co-ordinating Office.

7.6.3 Issues and Concerns

From the above review of players, it is possible to make some general observations:

- initiatives in long-term monitoring will inevitably use existing networks as far as possible (creating networks of networks)
- there is a requirement for monitoring to encompass not only ecological factors but to also link socio-economic factors, and
- the data are to be compared, analysed and presented not merely to meet scientific/research objectives but also to meet the needs of policy-makers.

In summary, it could be said that currently long term monitoring activities are being carried out by too many disparate groups, attempting to measure too many things, at many different locations. This is reflected in the following issues.

- *Need for a strategic approach:* Currently there is no general agreement on what should be "monitored" – the items to be measured, how often, at which locations, how measurements should be made etc. There is a need for a strategic or "top-down" approach that seeks to identify the purposes and goals of long-term monitoring, including the range of policy decisions it is to support. From this questions of what to monitor to meet these needs can be answered.

- *Standards and protocols:* Although there may appear to be a substantial amount of long term monitoring data available, it is the result of many heterogeneous data collection exercises. Most long term monitoring activities originated to address specific issues and established a network of sites for that purpose. Bringing together multiple networks (or selected sites from different networks) means that a process of integration is required to ensure that consistency (essential for long-term monitoring) is achieved. Existing networks have different objectives, operate on different scales, collect different kinds of data, and so on. Overall standards and protocols are needed.

- *Role of long-term monitoring in Indicators:* The use of "simple" indicators to communicate and compare status and trends is common in many fields and has many potential benefits. A variety of indicators applicable to ecological systems are currently in existence or are being developed. Although they have a common objective of improving the transmission of complex findings, particularly in the context of policy development and evaluation, there are considerable differences in derivation requirements and in interpretation.

- *Funding:* Establishing continued funding for long term ecological monitoring is a consistent problem. Taking examples from above, GTOS is essentially a secretariat within FAO with minimal funding for its wide mandate, funds are not yet secured for BRIM's integrated monitoring, and so on. In general, all levels of government are reluctant to fund long-term scientific data collection programs to the same extent as in the past – and long-term ecological monitoring can be perceived as being such. This forces long-term monitoring programmes to "partner" in an opportunistic (not necessarily strategic) way, often with minimal resources to introduce the standards needed for long-term consistency, or to develop appropriate information systems for information analysis, synthesis, and communication. Although the requirement for

more policy relevant outputs has been recognised, timeliness is also a factor. Part of what is collected and assessed in any program must be communicated and shared with policy-makers in the shorter term. Keeping a balance between the requirement to show "early" results and the longer term goals can be difficult.

- *Lack of Clear Connection to the Conventions:* The dismantling of the former UNEP-GEMS programme has left a significant void in the collection of consistent long-term monitoring of terrestrial ecosystems in a way that allows for the identification of trends, and therefore for assessing the effectiveness of MEAs and other measures. It is currently not clear how long-term monitoring supports Conventions, or what are the present and future needs of MEAs in this regard. The extent to which this will be addressed by the Millennium Ecosystem Assessment is still not clear, although it certainly will contribute.

7.6.4 Current Harmonization Initiatives

There is an element of "harmonization" in almost all the activities undertaken by the major players. Bringing national networks together is a primary function of ILTER; GTOS is bringing together existing sites its regional and demonstration projects; ECN is a key player in efforts to harmonize observational programs across Europe. Harmonization of methods and procedures is essential to ensure consistent and comparable outputs from the monitoring activities.

Global Environment Outlook

The Global Environment Outlook is a broadly based assessment effort led by UNEP. Involving a large number of organisational and individual participants it essentially attempts a periodic global state of the environment report. It is not in itself a harmonization initiative, but an effort to use, integrate where possible, and interpret available data sources. The third such volume, GEO-3 was published in 2002. Only a small portion of the GEO is related to biodiversity and the report comments on the lack of monitoring programmes capable of providing consistent time-series in this field. An associated "GEO Data Portal" is intended to be a starting point for holding such reference data, and may lead to harmonization in the future.

GTOS-TEMS

Information on approximately 500 sites carrying out long term terrestrial monitoring and associated research activities in 85 countries has been compiled in the TEMS database. Originating from GEMS in the early 1990s, GTOS has co-ordinated efforts to define variables, measurement methods, etc, and compile metadata on sites. The database can be accessed through WWW and various search facilities are available. The three observing systems (GOOS, GCOS and GTOS) are collaborating through a Joint Data and Information Panel and have put in place common data and information policies. In addition they have establish the Global Observing Systems Information Centre (GOSIC) hosted in the University of Delaware, with the intention of making "G3OS" datasets available easily.

BRIM implementation strategy

In November 2000, the International Co-ordinating Council of MAB called for re-orientation of the work on BRIM and a meeting was held in September 2001 to facilitate the implementation of this. The meeting was hosted by the GTOS Secretariat and was attended by representatives of Species 2000, ICP/IM, UNEP-WCMC, CIESIN, EuroMAB, UK-ECN, Wetlands International, UNEP-DEWA, as well as a number of national and academic experts. It was agreed that BRIM could provide primary datasets for various global biodiversity assessments such as the Millennium Ecosystem Assessment, assist the Ramsar Convention and other conventions, and be of value to IGOs, NGOs and for policy development and assessment. The BRIM data policy identifies a need for "data assimilation" mechanism to bring together existing information, and a metadatabase is proposed based on existing consensus-based standards. Compatibility with GTOS/TEMS was to be pursued.

Millennium Ecosystem Assessment

Although current documents are in draft form, the MEA will involve the development and distribution of multiple datasets and indicators. This will involve considerable critical assessment and peer review. To ensure harmonization and co-operation, the MEA Board includes representatives of UNESCO (BRIM), GTOS, and ILTER.

Natura 2000/Emerald Network

The relationship between these ensures that standards will be consistent across both Networks. These activities are also integrated with the OECD environment questionnaire through joint working groups co-ordinated by ETC/NPB.

PEBLDS and EBMI-F

A further harmonization initiative developed as a result of the PEBLDS is the European Biodiversity Monitoring and Indicator Framework (EBMI-F). This initiative aims to enhance the possibilities for creating more synergy among past, present and future biodiversity monitoring-to-reporting efforts at the European level in order to reach higher efficiency and effectiveness in communicating the state of, and trends in, Europe's biodiversity to the policy-makers concerned.

The Council of the PEBLDS has requested ECNC and EEA to develop and co-ordinate EBMI-F in order to support the implementation of PEBLDS. It will provide input into the next Ministerial Conference 'Environment for Europe' in Kiev, 2003. A proposal for EBMI-F has been developed jointly by ECNC and EEA.

7.6.5 Recommendations

Developments of elements of a strategic approach, standards, protocols and indicators all require significant effort from many players and can only take place over time. long-term monitoring activities must continue using what now exists, incorporating better approaches as they evolve and are proven.

Strategic:

> ***Strategic recommendation 6.1: Encourage world-wide co-operation and integration of long-term monitoring programmes - especially seeking the rationalisation and integration of BRIM, ILTER and GTOS.***

> ***Strategic recommendation 6.2: Contribute to identifying the information needs for national and regional policy making and communicate these needs to the long-term monitoring programmes to assist in streamlining and focussing information collection.***

Practical:

> ***Recommendation 6.1: Identify priority ecosystems for UK interests, particularly reflecting the needs and values of UK convention obligations, and clarify the monitoring needs for these in the European and global monitoring programmes.***

> ***Recommendation 6.2: Continue to encourage exchange of experiences between organisations within the UK, through funding support to such mechanisms as the UK Biodiversity Indicators Forum.***

Recommendation 6.3: Provide specific guidance to the EEA on the type of information outputs required by DEFRA (and the UK in general) to guide policy, and define areas in which "pilot" projects in the context of Natura 2000 or PEBLDS would be helpful.

Recommendation 6.4: Support the proposal currently under development for the establishment of a European LTER (being prepared by a consortium involving NERC's Environmental Change Network for submission to the EC for funding).

Recommendation 6.5: Utilise the strengths of UK institutions, for instance by promoting the monitoring protocols of the UK Environmental Change Network as a model for programmes such as BRIM and ILTER.

Recommendation 6.6: Sponsor a meeting on how GTOS, ILTER, BRIM and other such monitoring networks can support the biodiversity conventions, possibly through a workshop hosted by CEH or UNEP-WCMC to develop ideas for wider discussion (noting that the UK has previously supported a similar meeting in the initial stages of development of GTOS).

Recommendation 6.7: Review the proposal for European Biodiversity Monitoring and Indicators Framework (EBMI-F) and consider to what extent the UK can contribute expertise and experience (e.g. of the Environmental Change Network) and ensure harmonization with global monitoring networks and indicator development.

Recommendation 6.8: Consider alternatives that would make GTOS more responsive to the needs of the biodiversity conventions and policy-makers, and connected to the GEO process. This may mean giving thought to the relationship between FAO and UNEP in the management and implementation of GTOS.

7.7 CLUSTER 7 – TAXONOMIC INFORMATION

7.7.1 Introduction

This cluster deals with information services that provide broadly-based taxonomic reference information, and related standards, information exchange and capacity building in taxonomy. (Excluded are very narrow services dealing with only one class or a few species - relevance to policy is a necessary condition for inclusion.)

In total there are 34 information sources in the Reference Guide, and the following are the key sources:

- All Species Inventory
- Global Biodiversity Information Facility (GBIF)
- Integrated Taxonomic Information System (ITIS)
- International Plant Name Index (IPNI)
- International Species Information System (ISIS)
- Royal Botanic Gardens Kew - Global plant databases
- Species 2000

7.7.2 Players

From the UK perspective, there are three main levels at which information is required and at which networks operate: national, regional (European and specifically EU) and global. Purely national institutions and information resources are not considered further here. The following gives more

details of regional and global activities relating to MEAs and their requirements, and UK institutions of regional and/or global significance.

Convention on Biological Diversity (CBD).

Article 7 of the CBD calls on Parties to identify and monitor components of biological diversity, particularly those under threat. This is the basis for its adoption of the Global Taxonomy Initiative, outlined above. However, because the Convention currently avoids the development of normative standards and any other characteristics of a compliance regime, it has not made decisions regarding taxonomic standards, nor is it likely to do so in the near future. For the same reason, it has not adopted any lists and therefore has no explicit need for specific taxonomic information, nor information on the status of particular species.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The fundamental basis of action under CITES is the lists of taxa in its three appendices (of which Appendix I and Appendix II are by far the most important). The Convention has a very clear need for standardised taxonomies of those taxa that are included in its appendices. Without this, implementation of the Convention is seriously compromised. The Convention has no need for taxonomic information on species that are not included in its appendices. However, the appendices are not fixed, and species or groups of species may be included in them or removed from them at any time, following fixed procedures (such changes normally take place every two years at meetings of the Conference of the Parties). Currently some 5000 species of animals and plants are included in the appendices with by far the largest group comprising all members of the orchid family (Orchidaceae).

The Convention has adopted standard taxonomic references for birds, mammals, reptiles and amphibians. Parties to the Convention have supported the development of checklists of species included in the appendices; those for animals include information on distribution by country of the species concerned as this information is also important in implementation of the Convention. Identification manuals have also been prepared for a number of species included in the appendices although far fewer species have been covered to date than are included in the various checklists.

Convention on Migratory Species of Wild Animals (Bonn Convention)

The Bonn Convention also functions on the basis of lists of species in its appendices and included under particular agreements and/or MOUs that come under the auspices of the Convention. All species included in the appendices are vertebrate animals, mostly birds. The Convention's taxonomic requirements are therefore not extensive. Successful implementation of the Convention and its various agreements is, however, helped by the availability of more detailed information on those species included in the appendices and agreements.

Convention on Wetlands (Ramsar Convention)

The Convention on Wetlands is a site-based convention in which each Contracting Party is required to identify at least one wetland of international importance. These wetlands are intended to be afforded particular protection by the Contracting Party. The Convention has adopted a series of criteria for identifying such wetlands, of which several involve assessment of the species present, particularly fishes and waterbirds, but also others, including plants and invertebrates. The criteria emphasise threatened species and also provide some quantitative guidelines for the proportion of a bio-geographical population of a waterbird species or subspecies present in a site that should be taken as indicative of international importance. The Convention therefore makes use of information on species, but this information is not a *prima facie* requirement for implementation of the Convention.

Convention on Conservation of European Wildlife and Natural Habitats (Bern Convention)

The Bern Convention functions on the basis of its appendices, which list strictly protected flora and strictly protected and protected fauna species. The lists of fauna species include several invertebrates in a

range of groups, as well as vertebrates. The Convention has a requirement for taxonomic information and information on the status in Europe of the species in its appendices.

EC Birds and Habitats Directives

Again these function on the basis of agreed lists of species in a manner very similar to the Bern Convention. The Habitats Directive is essentially an EC mechanism for improved implementation of the Bern Convention in Europe, and many SPAs under the Birds Directive are also Ramsar sites.

UK-based institutions

The UK houses a number of globally important institutions involved in species-based data-management initiatives. With respect to taxonomy the Royal Botanic Gardens, Kew, the Royal Botanic Garden, Edinburgh and the Natural History Museum, London are of major importance. The first two deal with plants, the last with all taxa although its major strength is in animals. BIOSIS administers the Zoological Record, the unofficial global register of new descriptions of animal species. The IUCN Species Survival Commission Red List Programme of threatened species is based in Cambridge, UK, as is the UNEP World Conservation Monitoring Centre and BirdLife International. CABI (formerly the Commonwealth Agricultural Research Bureau) houses a number of global taxonomic databases, chiefly of fungi. BioNet International, involved in taxonomic capacity building, is an offshoot of CABI. The Centre for Plant Diversity and Systematics, University of Reading, hosts the secretariat of the Species 2000 initiative.

Other UK institutions are involved in regional initiatives, particularly those relating to the EU.

7.7.3 Issues and Concerns

The two clusters, *Cluster 7 - Taxonomic Information* and *Cluster 8 - Species Status Information,* are closely interrelated. Much of the following introductory material and issues apply equally to Cluster 8 and are not repeated there.

The species concept

In any consideration of management and dissemination of information about biodiversity at the organismal level, the species name (Latin binomial) is fundamental. A vast amount of further information can be attached to this "peg", some of which is discussed further below. Because of the central role of species names in managing information about organisms, there is widespread agreement that an agreed and universally available standard of all species names (and secondarily a higher level classification system into which these names would fit) would be in principle a valuable thing - this is indeed the major thrust of several current initiatives. There are, however, a number of fundamental problems with ever achieving this.

Probably the single most important reason why such a goal is not achievable is that there is not, nor will there ever be, a single universally agreed concept of what constitutes a species across all groups of organisms. The species concept is thus a flawed (though nevertheless extremely valuable) one. In very many cases there is, simply, no "correct" answer as to what are the species in a particular group of organisms - the species and higher level classification system depends on the views of the particular taxonomist or taxonomists concerned.

For this reason, the taxonomic literature and taxonomic databases are littered with synonyms - the same organism described under a range of different names and within different classificatory systems and, sometimes, the same name used to refer to a range of different organisms. There are agreed sets of rules for dealing with the naming of organisms (the International Code for Zoological Nomenclature and its equivalents) but these deal with procedural issues and are not designed to arbitrate between competing taxonomies.

In sum, therefore, because taxonomy is a dynamic science and because there is no such thing as universally applicable species concept, the adoption of a single, unchanging standard for all organisms

(i.e. an accepted checklist of all species) will effectively never be possible, even from a theoretical standpoint. There is thus an important conceptual difference between such an undertaking and, say, the human genome project, with which it is often compared. The latter has, to a very large extent, a fixed end-point and an agreed language or system in which the results can be expressed. The obstacles to be overcome were essentially purely technical ones.

Even if this ultimate goal is unobtainable, there are, of course, many compromise steps on the way, which may in themselves yield valuable results. The practical choice will be between standards that are flawed and, in any active area of taxonomy, immediately out of date but which provide some stability for end-users and the constant modification of standards as taxonomic understanding alters with advancing knowledge (and changing fashions). The latter approach entails the need for constant or at least regular re-adoption of standards; this needs agreement from the important actors involved and necessitates the updating of links of all kinds to other information.

There are, however, still serious practical problems to be overcome in the establishment of even contingent and incomplete taxonomic standards.

The scale of the problem

It is estimated that some 1.7 million organisms have been scientifically described to date, that is given reasonably well-accepted names. The great majority of these are invertebrate animals, principally insects, of which the largest group is beetles. Plants make up another 270,000 or so. The best known group - vertebrate animals - comprises a mere 46,000 species of which half are fishes. Descriptions of these species (i.e. the official record of their naming) are scattered through the scientific literature. Resolving all these and making them widely available in a reasonably widely acceptable form is a major task.

Moreover, there are believed to be many times more species than this that have yet to be described at all - most estimates range from ten to fifteen million, although some put the figure as high as seventy million. The great majority of these putative un-described species are generally held to be invertebrates (again mostly insects) in tropical moist forests, various forms of micro-organisms, particularly those occurring in the soil, and marine invertebrates. Some of these organisms are represented in as yet unclassified collections in museums and herbaria. Others have never been collected. Describing those that have been collected is a task at least equal to that of resolving and reconciling existing descriptions. Collecting and subsequently describing a high proportion of those as yet uncollected species that are believed to exist is a task of vastly greater complexity, necessitating as it does intensive sampling of the world's remaining tropical forests, deep sea habitats and soils. It is effectively unfeasible at present.

Institutional constraints

The study of taxonomy and systematics has not been considered a scientific discipline of high priority for many years, arguably not since the nineteenth century. Lack of investment and a concomitant difficulty in attracting highly qualified young people into the profession has meant that there are many areas, both geographical and in terms of groups of organisms, where there may be few if any active taxonomists. Most significantly, there is a chronic shortage of well-resourced taxonomic institutions and practising taxonomists in much of the tropics, where the great majority of the world's species occur.

Standing apart from this are a small number of institutions, chiefly museums and herbaria (the latter often associated with botanic gardens) and mostly in Europe and North America, which dominate the taxonomic world. These institutions are often historically of long-standing and have therefore accumulated large and important reference collections that are generally international in scope. They usually also have active and productive research programmes in systematics and are ultimately the most important content providers for taxonomic databases. Any global networking initiative in the field of taxonomy that does not involve more than one of these major institutions is unlikely to flourish.

As with large institutions in general, all of these have complex internal dynamics and relationships with each other, in the latter instance typically blending to various degrees rivalry with a perceived need for co-operation and a shared sense of community.

Because the taxonomic community is a relatively small and marginal one (both in the scientific and policy contexts), particular individuals and specific interpersonal relationships can play an important role in shaping policy and action at global level. This can have both positive and negative impacts. Positive in that a small number of highly motivated people can achieve a lot. Negative in that much energy may be dissipated in internecine strife and specific personality clashes may operate as a serious impediment to large-scale institutional co-operation.

The taxonomic impediment?

The major global governmental policy arena on biodiversity, the Convention on Biological Diversity (CBD), has acknowledged the existence of a "taxonomic impediment" in preventing the Parties to the Convention from meeting the Convention's objectives (conservation of biological diversity, sustainable use of the components of biological diversity and equitable sharing of the benefits of exploitation of genetic resources). In response it has launched a Global Taxonomy Initiative, a detailed work-plan for which was agreed at the sixth meeting of the Conference of the Parties in April 2002.

Impetus for the Global Taxonomy Initiative has come largely from taxonomists representing governments at meetings of the CBD's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), notably at the second meeting of SBSTTA in 1996, when the initial recommendation concerning the initiative was formulated. The main taxonomic institutions have seized upon the initiative, and the wider context of the CBD, to attempt to raise the profile of their own institutions, and taxonomy in general. This is the wider framework in which the further development of the current initiatives regarding management and dissemination of information on species should be viewed (although it is also true that several of these initiatives have their genesis largely outside this and some, particularly those which are entirely or predominantly US-based, continue to operate essentially independently of it).

How important is the taxonomic impediment?

As outlined above, viewed globally taxonomic information is very incomplete, what there is often scattered and unconsolidated, and there are relatively few active taxonomists and systematists.

What remains debatable is to what extent and exactly how this impedes conservation action. The answers to this are not straightforward, and depend very much on the context in which the questions are asked. However, at the highest level it is almost certainly true to say that missing, inadequate or inaccessible taxonomic information is not generally a critical barrier to conservation action. Rather the major obstacles to effective conservation are a lack of political will coupled with the inertia inherent in our current development trajectories and a lack of good understanding of the long-term impacts of our actions on the biosphere as a whole or on particular parts of it. Improved taxonomic understanding would certainly play a role in overcoming the last of these, but probably only a minor one.

Put another way, it is unclear exactly what a resolved and consolidated, freely available database or catalogue of all the world's currently described molluscs, say, or all the world's beetles (neither of which currently exists), would contribute to conservation ends because it is not clear precisely what conservation decisions require such information. This is not to say that such an undertaking would not itself be worthwhile from a scientific standpoint - systematics provides one of the most important theoretical underpinnings for biodiversity conservation - merely that any connection with conservation action will be tenuous and indirect at best.

One reason for this is that those areas (both geographically and taxonomically) where information is most lacking are very often precisely those areas where there is the smallest constituency - outside taxonomic circles - for it. That is, there are very few people who can make active use of information on deep-sea invertebrates or insects in tropical moist forests and formulate and implement conservation actions on that basis. Those sectors that are the focus of direct conservation action tend to be fairly well known and in some cases very well known. This applies to mammals and birds world-wide and to most of the other major taxonomic groups in most OECD countries.

Within this broad framework there are, of course, many instances in which there is a clear, well-defined need for specific taxonomic information. These are discussed in greater detail below.

7.7.4 Current Harmonization Initiatives

Species 2000 has the objective of enumerating all known species of plants, animals, fungi and microbes on Earth as the baseline dataset for studies of global biodiversity. It intends to act as a simple access point enabling users to link from here to other data systems for all groups of organisms, using direct species-links. It is intended that users world-wide will be able to verify the scientific name, status and classification of any known species through species checklist data drawn from an array of participating databases. The initiative currently has 18 contributing taxonomic database organisations.

The Global Biodiversity Information Facility (GBIF) has been established through an intergovernmental process with the aim of increasing access to the vast quantities of global biodiversity data, especially that which exists in museums and herbaria. The four priority work programme areas identified as the primary focus for the first three-year phase are to: create an Internet-based catalogue of known names of species; digitise data on species information in museums and herbaria; create interoperability of databases and search engines for accessing these data; and build capacity in nations for implementation of GBIF. GBIF is essentially a scientific facility, and UNEP anticipates working alongside GBIF members in developing species information databases. Specifically, UNEP seeks, in co-operation with GBIF members, to enhance the quality and quantity of species-specific information available to convention secretariats and to contracting parties in support of implementation. This should also allow better and more uniform approaches to taxonomy, and taxonomic listings.

All Species Inventory is a project being undertaken by a US-based foundation (the All Species Foundation) established specifically for this purpose. Its aim is to ensure that all the world's species are described and catalogued within the next 25 years. Its major thrust is therefore the collection and naming of as yet un-described species, although part of this endeavour will presumably be collation of information on currently known species It does not appear to have strong institutional links with any of the major taxonomic institutions, although it has high-profile biologists on its advisory board.

The International Plant Name Index is a joint initiative of the Royal Botanic Gardens, Kew, the Gray Herbarium, Harvard, and the Australian National Herbarium. It is a list of recognised plant names and incorporates Kew's Index Kewensis of plant generic names. The index does not, however, include synonyms or make judgements as to which name should be preferred. It cannot therefore be used as a taxonomic standard, although any plant names included in such a standard should feature in the index. The initiative involves three of the most powerful plant taxonomy institutions in the world, but does not include Missouri Botanic Gardens, who have their own system.

The International Organisation for Plant Information is currently at prototype stage of a Global Plant Checklist, which is intended to be an authoritative species list with accepted names, synonyms and distributions. It therefore differs from the International Plant Name Index. It is based jointly at the Royal Botanic Gardens, Sydney, Australia and Toronto, Canada and is a contributing database to Species 2000.

BioNET-International is essentially a capacity-building initiative which aims to help developing countries to become self-reliant in taxonomy, principally through support of locally organised and operated partnerships of institutions (LOOPs) in developing regions. It maintains links to the World Taxonomist Database, but is not directly involved in large-scale taxonomic database initiatives. The technical secretariat is UK-based.

The Taxonomic Database Working Group (TDWG) is a relatively small group, under the auspices of the International Union for Biological Sciences (IUBS) that develops standards and protocols for taxonomic databases. These are couched in the form of recommendations rather than mandatory systems and refer to

database design and information exchange rather than taxonomic standards themselves. The secretariat is hosted by BIOSIS in the UK.

7.7.5 Discussion

Although from a conservation point of view, it is undoubtedly far from the highest priority for investment, there is clearly a need for better access to existing taxonomic information about living organisms. The Internet presents an ideal opportunity for improving such access, and indeed in the longer term for revolutionising the practice of taxonomy and taxonomic publishing. It is not, however, immediately apparent how best to seize this opportunity, and in particular which of the existing initiatives are best placed to take a lead.

Internationally the two major initiatives are Species 2000 and GBIF. The American-based ALL Species Inventory appears to sit outside the mainstream at present and does not merit further serious consideration. Species 2000 has at least some operational components and is adopting a pragmatic approach. Its further development is currently hampered by lack of funding and, apparently, to some extent by institutional (and individual) politics.

GBIF is much more ambitious in scope than Species 2000 but has yet to become operational. Its existence is largely a result of the efforts of one person, Ebbe Nielsen, who died in early 2001. His death will almost certainly have adversely affected the impetus of the initiative. However, it does now have well-defined governance and institutional structures with a governing board and an embryonic secretariat. At the time of writing (June 2002) it seems unlikely that any concrete work will be started until 2003 at the earliest. Of the four main priority work programme areas (data interoperability; catalogue of known organisms; digitisation of collection data; and capacity building) all are currently in progress in one form or another by other initiatives: data interoperability by TDWG; catalogue of known organisms by Species 2000; museum and herbarium specimen information by a combination of IT IS, the Species Analyst and the European Natural History Specimen Information Network (ENHSIN); live animal specimen information by ISIS; and taxonomic capacity-building by BioNET-International and other components of the Global Taxonomy Initiative of the CBD.

The potential overlap with these initiatives is acknowledged by GBIF, and most of them are associate participants in GBIF. In the case of the catalogue of living species, GBIF has explicitly stated that it may wish to ask Species 2000 to undertake some or all of this part of the work programme. Nevertheless, GBIF does not appear to have made the case persuasively that it is needed as a co-ordinating body over and above these existing initiatives, and it may be that direct investment in at least some of the latter may be more cost-efficient than investment in GBIF.

If it does become operational, the value of GBIF may be more to raise the profile of taxonomy and systematics at global level, that is to help these disciplines achieve the status of "big science", rather than in any inherent value as a unique data provision and co-ordinating mechanism. It is on this basis that any investment or otherwise might best be judged.

7.7.6 Recommendations

Strategic:

> ***Strategic recommendation 7.1: Encourage and support taxonomic initiatives that serve to support nature conservation and the needs of MEAs, pushing for pragmatic and useful harmonized systematics and co-ordination efforts that support well established, on-going programmes.***

Practical:

> ***Recommendation 7.1: Continue support to GBIF but recognise that any large-scale investment should wait until it is clearly demonstrated what role GBIF will play that is not currently undertaken by existing initiatives.***

We note and support the recent recommendation of the House of Lords Select Committee on Science and Technology (Third Report, 2 May, 2002) that reads in part:

> *We recommend that the united Kingdom should take the lead and propose to the Global Biodiversity Information Facility (GBIF) that the GBIF run a pilot with some priority species to form the basis of a trial for ... making taxonomy primarily digitised and web-based. A trial would demonstrate the benefits and pitfalls of this approach before implementing it more widely.*

We agree with the caution indicated in recommending pilot and feasibility trials in conjunction with existing activities and players for any major initiative proposed by GBIF.

Recommendation 7.2: Promote and support moves to harmonize the taxonomies used by each of the different international agreements that have scheduled lists of species, where appropriate promoting the establishment of joint taxonomic working groups building on the expert groups that already exist.

Recommendation 7.3: Species 2000, as a UK-based existing and operational initiative merits support, although any possible institutional impediments to its progress should be investigated and attempts made to resolve these.

Recommendation 7.4: The European Natural History Specimen Information Network (ENHSIN) is not a high priority from a conservation viewpoint but is also an ongoing initiative that may merit support for its scientific work.

Recommendation 7.5: BioNET-International appears to play a valuable role in capacity-building in taxonomy in developing countries, and as such support of this initiative which is UK-based, will help the UK to fulfil its responsibilities as a developed country Party to the CBD in implementing the Global Taxonomy Initiative.

7.8 CLUSTER 8 – SPECIES STATUS INFORMATION

7.8.1 Introduction

This cluster includes comprises sources and services that provide information on the conservation status of species, species populations, distribution, threats, and related ecology, as well as species "checklists".

In total there are 55 information sources in the Reference Guide, and the following are the key sources:

- Biodiversity Conservation Information system
- CITES Listed Species Database
- European Nature Information System
- Global Register of Migratory Species
- IUCN Red-List
- Natura 2000 Network
- Species Information System
- UNEP-WCMC Animals Database
- UNEP-WCMC Threatened Plants Database

There is considerable interrelation between species information systems and taxonomy reference systems and no clear cut boundary. Systems to organise and make available information on specimens held in collections fall clearly between the two, and have mainly been discussed under Cluster 7.

7.8.2 Players

Globally there is a large number of players involved in the provision of wider information on species. Many of these, however, are highly specialised and sectoral in nature, or have primarily an educational function. There is a much smaller number of key players involved in provision of species information as it relates to natural resource management, maintenance of biodiversity and resource management. Several of these are the same players as those identified in 7.7.2 above.

Convention on Biological Diversity (CBD)

As noted in section 7.7.2, the CBD has no mandatory requirements for centralised information on species. However. many of its decision, particularly those that relate to its thematic work programmes (e.g. forests, inland waters, alien species), call for the dissemination of information on species, with emphasis on those in the various categories identified as of importance in Annex I of the Convention (e.g. threatened species, wild relatives of domesticated or cultivated species and those of social, scientific or cultural importance).

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES has a requirement for information on the distribution of species included in its appendices and also gathers information on international trade in these species as provided in national reports submitted by Parties to the Convention. The information on trade is held in a database maintained by UNEP-WCMC.

Convention on Migratory Species of Wild Animals (Bonn Convention)

The major information source for the Bonn Convention is the Global Register of Migratory Species (GROMS), described in 7.8.4 below.

Convention on Wetlands (Ramsar Convention)

A Ramsar Database that incorporates information on wetland species is maintained by Wetlands International, based in Wageningen in the Netherlands..

Convention on Conservation of European Wildlife and Natural Habitats (Bern Convention) and EC Birds and Habitats Directives

Data requirements for these are principally met in the EC by the EUNIS and Natura2000 initiatives.

UNEP-WCMC

UNEP-WCMC, based in Cambridge, UK, is the biodiversity assessment centre of UNEP. As well as maintaining a species information database, described in 7.8.4 below, it undertakes wider analyses of biodiversity issues that incorporate information on species. In its original incarnation, as the IUCN Conservation Monitoring Centre (1980-87), its major function was to produce IUCN Red Data Books on threatened species. It maintains major legacy holdings from this programme, which has been replaced by the production of the IUCN Red List.

IUCN – the World Conservation Union

IUCN, and particularly its Survival Service Commission (SSC), originally the Species Survival Commission, has played a key role in provision of information on species, notably globally threatened species, since the 1960s. The SSC is a dispersed organisation. The SSC programme office is based at IUCN headquarters in Gland, Switzerland but its Red List programme on globally threatened species

and wildlife trade programme are based in Cambridge, UK, and the voluntary experts that form its specialist group network are distributed throughout the world. Its current major initiative in the provision of species information is its Species Information System (SIS) discussed in 7.8.4 below. The Red List programme is intended to form part of the SIS.

BIRDLIFE International

BirdLife International is a global partnership of non-governmental conservation organisations with a focus on birds. Its headquarters are in Cambridge, UK. The organisation maintains information on wild bird species, particularly threatened species, and is responsible for the production of the Red Data Books on threatened birds, and for maintaining that part of the IUCN Red List that deals with birds. Information on threatened birds is stored in a database and is used periodically to produce the publication Threatened Birds of the World.

Several of the institutions that have a primarily taxonomic focus also play a role in some of the wider species information initiatives. Within the UK the most important of these are the Natural History Museum, Royal Botanic Gardens, Kew, and Royal Botanic Garden Edinburgh.

7.8.3 Issues and Concerns

See also the issues discussion for Cluster 7 (Sec.7.7.3)

Species Information Systems

From a practical point of view, and particularly with respect to conservation, taxonomic information (including authorities, citations, synonyms and higher level classifications) is of itself only of very limited use. Its value increases greatly when it becomes linked to other kinds of information, of which the most important are:

- Common names in various languages
- Description
- Biological information (population, distribution, ecology, physiology etc)
- Location of specimens (both museum and in living collections)
- Legal information (status in various MEAs, regional agreements and domestic laws)
- Genetic information (gene sequences etc)
- Information on forms of use or value to humans
- Information on threats to the species
- Bibliographic information

Most taxonomic databases in reality already contain some additional (i.e. non-taxonomic) information, most often on location of specimens and geographical information. There are, however, important differences between a database that is fundamentally intended as a taxonomic resource and one whose main aim is to provide other information. Chiefly, this is because there are so many other kinds of information. The value of any given piece varies enormously among different users and any one kind of information may only be of major interest to a subset (which may be very small) of the overall species information user community. The amount of information available itself varies enormously from species to species and there are far fewer established standards for most of it than there are for taxonomy.

This raises a number of important issues for providers of species information. In the first instance a strategic decision should be made (though often is not) whether the aim is to provide focused information for particular users who have clear-cut and often specialised information needs, or whether it is to provide a wide range of information to a larger, often unspecified or only loosely specified, user community.

All species information systems have significant establishment costs. To remain useful, they also have significant recurrent costs. As with all forms of information system, they have basic maintenance costs and the built-in costs of information technology turnover. There are also specific costs related to the kinds of information dealt with, and the uses to which it is intended to be put, so that the relative balance

between establishment and recurrent costs is variable. Taxonomic databases and those that deal with herbarium and museum specimen information have large establishment costs, a significant component of which is processing the back-log of existing information, but relatively speaking lower recurrent costs, as the rate of acquisition of new information or knowledge, once the back-log has been cleared, is fairly low. Information on distribution, particularly when presented in GIS form (increasingly seen as a key component of environmental information systems in general), typically has very high establishment costs resulting both from the work involved in compiling existing information, and the digitising of that information. Recurrent costs should in principle also be fairly high as distributional information needs to be ground-truthed and should almost always be refined or modified in the light of better understanding, but in practice rarely is. Information on the status of species, in terms of population changes, conservation category assessments (such as IUCN Red List categories) and factors that have an impact on populations (including harvest and trade information) are only of significant use if these are kept updated, although the desirable or realistic frequency of such updating also depends on the kinds of information involved. Recurrent costs of databases with these kinds of information are therefore high.

Whatever kind of information is considered there is almost always a tendency to underestimate the costs in keeping it current. Even where there is widespread agreement that the information provided is useful and valuable there is an almost universal reluctance on the part of user communities to pay for the true costs of maintaining it. This explains, for example, why attempts to make potential private users (i.e. the business community) to pay to maintain species information at WCMC, before the incorporation of the latter into UNEP, failed and were almost certainly doomed to failure from the start.

Intellectual property and the sharing of information

Institutions and individuals holding significant amounts of biodiversity-related information almost invariably exist in a state of tension concerning the degree to which they would like that information to be widely available. On the one hand there is widespread appreciation that such information should ideally be freely available, particularly to decision-makers if there is a possibility that it will help make better decisions relating to the conservation of biodiversity. On the other hand, many consider such information to be their single most valuable resource, in which they have invested a great deal, both personally and financially and are reluctant to see what they perceive as others reaping the rewards from this. Such concerns exist both within the scientific community whose reward system is based around publication of novel findings, often predicated on having sole or preferential access to a body of information and in the policy and applied conservation arenas where work is increasingly carried out on a commercial or partially commercial basis (either by commercial companies or by not-for-profit organisations, both governmental and non-governmental carrying out consultancy work).

Where data-collection is specifically funded through governments or foundations these issues may be of lesser concern because there is a growing tendency to make public access to the resulting data a condition of funding. In addition, many scientific journals now insist as a condition of publication that the data used in the paper be made freely available (usually over the internet). However, where data are gathered in a voluntary capacity (as for example in the IUCN/SSC network discussed below), as part of the core activities of an institution or in any commercial context these problems are likely to persist.

At intergovernmental level, the continuing elaboration of the provisions of the Convention on Biological Diversity on access and benefit-sharing agreements and the perceptions of individual countries, particularly developing nations that are biodiversity-rich, may also start to serve as growing impediments to the free flow of information on biodiversity.

7.8.4 Current Harmonization Initiatives

Specimen databases

ENHSIN (the European Natural History Specimen Information Network) is a European initiative designed to enable the development of a shared, interoperable infrastructure of natural history specimen databases in European institutions. Seven European organisations are involved in the initial phase of the project. Their aim is to create an operational system for what is hoped to evolve into a

pan-European network. Over the duration of the project, which is destined to run for three years, the partners will address such issues as defining data standards and assessing intellectual property restrictions. The partners are: the Natural History Museum (London); the Royal Botanic Gardens, Kew; Zoological Museum, Copenhagen; Museo Nacional de Ciencias Naturales, Madrid; the Muséum National d'Histoire Naturelle, Paris (MNHN); Botanischer Garten und Museum Berlin-Dahlem (BGBM); Universiteit van Amsterdam (UVA).

Integrated Taxonomic Information System (ITIS) originally grew out of a US Federal Government initiative and is based on a partnership of Federal Agencies. It provides a gateway to specimen information from ENHSIN (above), The Species Analyst (which has links into specimen databases from around 60 institutions, almost all in North America) and REMIB (a small, largely Mexican-based network).

Initiatives related to wider aspects of species information

The Species Information System (SIS) is an ambitious project under the aegis of the IUCN Species Survival Commission (SSC) for a world-wide species information resource consisting of inter-linked databases of species-related information. Data custodianship and responsibility for quality control and updating of the system will rest with the SSC Specialist Groups. It is intended that not all information will be publicly accessible. That which is to be included in the Web-Enabled Species Information System. The IUCN Red List of Threatened Species is intended to be the flagship public access component of the SIS.

The International Species Information System (ISIS) is a computer-based information system for wild animal species in captivity. It collects basic biological parameters on the species included in the system and services as a centre for co-operative development of zoological software for in-facility use. It is based in the US and has around 600 participating institutions, with a North American bias. Most species included are vertebrates, particularly mammals and birds.

UNEP-WCMC's species databases provide information on plants and animals. The plant database contains over 140,000 plant names linked to 190,000 distribution areas. The animal database has records for nearly 73,000 animal species. The databases include IUCN Red List Species, species listed in the CITES appendices and a number of others, including vertebrate species that are endemic (confined to) one country. Distribution information is provided in geopolitical units rather than in GIS-form. These are currently probably the most extensive databases providing this kind of information.

ARKive is a programme to amass film, photographs and audio recordings of endangered species, in a web-based collection to be made accessible to all via the Internet. It is intended to be a resource for public awareness, media, education and potentially enforcement activities, a centralised audio-visual record of the world's endangered species. Based in Bristol, ARKive is a joint effort involving ABC Australia, the BBC, National Geographic, OSF and by specialist photographic agencies such as Bruce Coleman, and FLPA. It is also being backed by a broad range of conservation organisations: English Nature, Flora & Fauna International, IUCN, RSPB, UNEP-WCMC and WWF.

Common Access to Biological Resources and Information Service (CABRI) is essentially a quality-control gateway to a European network of centres supplying biological resources chiefly for biotechnology (including bacteria, archaea, fungi, yeasts, plasmids, phages, animal and human cells, DNA probes, plant cells and plant viruses). Its US equivalent is the National Centre for Biotechnology Information.

The Biodiversity Conservation Information System is an initiative of ten international conservation organisations and IUCN programmes intended to provide information to support BCIS members and others making decisions on the conservation and sustainable use of living resources. The Secretariat is currently housed in the USA. Although already in existence for several years, BCIS has yet to become operational as an information network. Its proposed relationship with other similar data-management initiatives carried out by member organisations (e.g. IUCN's Species Information System) is unclear.

Currently BCIS is exploring the notion of a knowledge commons rather than a series of structured databases with formal links.

The Tree of Life, TreeBASE and Deep Green are web-based databases that present phylogenetic information and biological information on particular lineages of organisms taken from published papers. They provide valuable scientific and educational resources, but are not species-based taxonomic databases.

The Global Invasive Species Programme is an initiative of the ICSU Scientific Committee on Problems of the Environment (SCOPE). Its secretariat is hosted in the USA and its goal is to provide tools to enable users to tackle the problem of invasive species. These tools are intended to include a public access global database on invasives. This appears still to be at a preliminary stage. Because invasives are found in a wide range of groups of organisms, such a database is likely to have an extensive need for taxonomic standards.

The Global Register of Migratory Species (GROMS) is a German-based database combining a relational database with a GIS. It is specifically linked to the Bonn Convention on Migratory Species (CMS) and has information on just fewer than 3000 migratory vertebrate animal species. Its scope is therefore relatively limited and it is essentially a compilation of data from a number of other databases, including the IUCN/SSC Red List Database, FishBase and the UNEP-WCMC species databases. Responsibility for the database is reportedly to be passed to the CMS Secretariat.

Botanic Gardens Conservation International is essentially a co-ordinating body. In 1987, BGCI was founded to link botanic gardens as a co-operating global network for effective plant conservation. It now includes over 450 member institutions in 100 countries. It has developed a computer database on the rare plants in over 300 institutions to bring world-wide co-ordination to the individual efforts of each garden.

Regional initiatives

The European Nature Information System (EUNIS) is a set of public-access databases that store information collected within the framework of the Natura 2000 programme. It is hosted by the European Topic Centre for Nature Protection and Biodiversity and contains information on more than 2500 European species and subspecies. Data on many of the species are limited, although there is a synonyms database.

Natura 2000 is the mechanism within the European Union (EU) for responding to the EU's "Habitats" and "Birds" directives, which are themselves effectively the EU's responses to the Bern Convention on the Conservation of European Wildlife and Natural Habitats. It consists essentially of a network of sites.

NatureServe Explorer is a regional North American initiative designed to allow access to a wide range of information on North American species, particularly those of conservation concern.

7.8.5 Recommendations

Strategic:

Almost all institutions have great difficulty in meeting the recurrent costs of data management. In the current climate it is not realistic to expect suppliers of biodiversity information to fund themselves from the commercial sector.

> ***Strategic recommendation 8.1: It is recommended that whichever initiatives are funded are likely to benefit more from lower levels of support over longer time periods than from larger one-off injections of funds in the expectation that they will then become self-funding.***

Strategic recommendation 8.2: Wherever possible, encourage all species databases to relate to each other and to reference common taxonomic standards.

Strategic Recommendation 8.3: With most species information initiatives, the data-gathering, assessment and analysis stages are more likely to be rate-limiting steps than the technical aspects of data-processing, so that support may be better concentrated on the former rather than the latter.

Practical:

There is currently a wide range of species information initiatives with an equally wide range of remits. To date efforts to draw these together, at the international level most notably under the aegis of BCIS (the Biodiversity Conservation Information System) have largely foundered. In part this has been because of inter-institutional problems although it can also be attributed to a shortage of funding. However, there may be more fundamental problems than this. The most important of these may be that it is difficult to identify a concrete need for a heavily integrated, co-ordinated system. Because of this, there is insufficient incentive on the part of the key players involved to overcome the problems, whether technical, institutional or financial, inherent in establishing and maintaining such a system. Attempts at co-ordination and central control also pull against what many see as the major strength of the Internet, which is its decentralised and reticulate nature.

It seems more likely that in the long-term development of translation protocols and standards to allow data to be taken from many different sources and integrated as the need arises is very likely to be a more productive avenue. Much of the technology for this will have applications outside species information systems and can therefore be expected to be developed in other sectors. However, the translation standards are subject-specific and more work needs to be done on these. One of the major avenues for facilitating integration is through the use of Geographic Information Systems as a platform for data – these present opportunities for linking information on species to information on a huge range of other environmental and socio-economic subjects.

Recommendation 8.1: The species information systems initiatives most worthy of support are those that serve specific roles, with clearly defined applications and end users. At regional and global levels these include:
- CITES and the EU Wildlife Trade Regulation databases with information on species whose trade is controlled
- Red List information on globally threatened species
- Information on species used to identify wetlands of international importance under the Ramsar Convention
- Information on migratory species included in the appendices to the Convention on Migratory Species and the various agreements under the Convention (currently housed in the GROMS database)
- Information on species relevant to the Bern Convention and the Natura 2000 network.

Recommendation 8.2: The Red List programme carried out by IUCN in collaboration with a wide range of organizations has high international profile and merits support. In the future it is anticipated that the developing IUCN Species Information System will contribute substantially to this process, but to date many feel that the need for such a system has yet to be clearly identified.

Recommendation 8.3: At the national level explore how domestic information and data can be contributed most effectively to these international programmes, and how the expertise of UK scientists can be utilized.

Recommendation 8.4: Work with CITES, UNEP-WCMC and others to improve the information available to customs and other enforcement officials to assist in their work, especially as aids to identification of scheduled species.

Recommendation 8.5: Encourage the ARKive project to work closely with existing species information services to identify how its film, photographic and audio holdings can effectively contribute to these information services (for example in providing the photographic information that will help support customs and enforcement officials in their work).

7.9 CLUSTER 9 - POLICY AND STRATEGY INFORMATION

7.9.1 Introduction

This cluster is concerned with information services that provide analysis and views on conservation policy, including the policy sources of UN and intergovernmental organisations, as well as policy "think tanks" and major NGOs.

In total there are 55 information sources in the Reference Guide, and the following are the key sources:

- European Centre for Nature Conservation Website
- European Environment Agency main Website
- European Topic Centre on Nature Protection and Biodiversity
- Pan-European Ecological and Landscape Diversity Strategy Guide
- United Nations Commission on Sustainable Development
- United Nations Environment Programme Website
- World Resources Institute Website

7.9.2 Players

Three main groups of participants make information on nature conservation strategies and policies available - governments (including the EU), intergovernmental organisations (including UN agencies) and NGOs. This information is useful for comparing national approaches, aligning national policy with regional or global directions, and getting a sense of the concerns and issues of civil society.

International treaty secretariats and those working to support them also provide information sources and services relevant to nature conservation policy and strategy, but these are primarily discussed in Cluster 1 (Sec7.1).

Governments:

National government websites (including sustainable development sites and biodiversity "clearing-houses") often provide current policy as well as policy proposals for discussion.
Within the Europe, the EEA's EIONET serves this purpose along with more general sites such as the EC Environment Directorate General.

Intergovernmental Organisations:

The UNEP and UNDP provide the principle outlet for international consensus on global policy directions (UNDP regional as well) and the development banks contribute regional assessments of needs, and policy directions. The UN Commission on Sustainable Development maintains a very useful compilation of national policy measures.

NGOs:

These divide into two main categories - conservation advocacy groups of which the IUCN, and WWF are the most significant, and "think tanks" that try to assess issues and provide independent policy suggestions and strategies (often commissioned by governments or international agencies). The World Resources Institute (based in the US) is a prime example that works closely with UNEP. the UK-based International Institute for Environment and Development (IIED) and Canadian International Institute for Sustainable Development (IISD) are other examples. In the European context the European Centre for Nature Conservation (ECNC) plays an important role in this regard.

7.9.3 Issues and Current Harmonization Initiatives

Currently it can be said that there are no significant efforts to co-ordinate or organise the availability of information on global or regional policy issues and strategic directions. "Clearing-house mechanisms" and regional integrated sources such as EIONET are arguably attempts at integration. The question arises as to whether there is any value in attempting a consolidated policy forum. Major Global assessments like the "Geo Process" and the Millennium Ecosystem Assessment bring together policy "think-tanks" such as WRI with private foundations, intergovernmental organisation and NGOs in various groups and achieve a level of harmonization. These groupings however ad-hoc - not permanent or structured - but may lead to the evolution of customary or standard ways of approaching assessments and developing strategic directions and policies.

Agenda 21 can be considered a harmonizing activity and the related work of The UN Commission for Sustainable Development in organising, reformatting and presenting national "reports" is a useful approach that serves to present national policy and action plans on a comparable basis. However, only a small portion of this information is relevant to nature conservation.

7.9.4 Recommendations

Strategic:

> ***Strategic recommendation 9.1: Promote wider sharing of information on biodiversity policies and the environmental impacts of EC and global policies in all related sectors (in particular water, agriculture and fisheries).***

Practical:

> ***Recommendation 9.1: Identify ways to make better use of the EEA and in particular EIONET as a forum for biodiversity-related policy discussion between European countries, and for jointly identifying information requirements for taking decisions and implementing policy.***

> ***Recommendation 9.2: Encourage the CBD CHM to establish a clearly defined policy component where national, regional and global biodiversity-related policies can be posted and discussed. This would probably concentrate on wider circulation and perhaps analysis of implementation of Article 6(a) on National Biodiversity strategies and Action Plans, and Article 6(b) concerning integration with other sectors.***

7.10 CLUSTER 10 - EUROPEAN NATURE CONSERVATION INFORMATION

7.10.1 Introduction

This cluster is cross-cutting to the others and was assembled because of the particular emphasis on European policy drivers identified in the earlier Needs Assessment and Workshops. Included are all

information services that deal with nature conservation in a European context, whether strictly EU or pan-European. All entries will of course also be classified into one of the more thematic clusters.

In total there are 29 information sources in the Reference Guide, and the following are the key sources:

- European Centre for Nature Conservation Website
- European Community Biodiversity Clearing-House Mechanism
- European Environment Agency main Website
- European Environment Information and Observation Network (EIONET)
- European Nature Information System (EUNIS)
- European Topic Centre on Nature Protection and Biodiversity (ETC/NPB)
- Natura 2000 Network
- Pan-European Ecological and Landscape Diversity Strategy Guide

Relationships between the players at multiple levels are very complex, and so this chapter examines processes and interactions more than other cluster analyses.

7.10.2 Players

The European Union and the wider pan-European region interact in a complex manner. For convenience in the following sections EU institutions are considered separately from those operating on a wider basis, but it should be noted that there is considerable co-operation both formally and informally.

European Union

The EU itself is a player in the arena of European nature conservation, plus various bodies and agencies set up by its 15 Member States, e.g.

- The European Commission (EC) and its Directorate-General Environment, based in Brussels, Belgium
- the European Environment Agency (EEA) based in Copenhagen, Denmark and its European Topic Centre on Nature Protection and Biodiversity (ETC-NPB) based in Paris, France;

The European Commission recently established a Biodiversity Expert Group (BEG) with a mandate to share information and promote the complementarity of actions taken at Community and Member State levels in the context of the implementation of the EC Biodiversity Strategy (COM (1998) 42) and its Action Plans (COM (2001) 162). This strategy concerns the EC response to the CBD in areas in which the EC has competence. The BEG includes representatives from the Member States, the Corporate Sector and NGOs. The BEG will promote the implementation of the Action Plans and monitor progress. The first meeting took place in Brussels 5 February 2002. The responsibility for the BEG rests with the Commission, DG Environment.

The EC and its various bodies and agencies play a central and co-ordinating role in European nature conservation within the EU and is also an important actor at the wider pan-European and international levels. The European Community is a contracting party to some of the intergovernmental Conventions and Agreements, collaborates in the implementation of others, and attends all UNECE meetings within the "Environment for Europe process".

The EEA is the principle agency for the delivery of environmental information and the co-ordination of projects and activities within the EU, as well as working with a number of countries outside the Union.. It has the stated mission: "*to deliver timely targeted relevant and reliable information to policy-makers and the public for the development and implementation of sound environmental policies in the European Union and other EEA member countries.*" A particularly important role at the moment is to assist potential accession countries to adjust environmental policies and information systems in preparation for joining the Union. It is funded by the European Commission (as controlled

by the European Parliament) to exercise this mandate under general guidance and direction. The choice and design of specific projects and activities is further guided by a Management Board with input from a Scientific Committee. The Management Board has representatives of all member states, as well as the EC, the European Parliament and the EEA. The Scientific Committee has membership based on scientific discipline and expertise. Its members do not represent states, but rather are experts in a particular scientific domain.

The work of the EEA is assisted by a number of European Topic Centres (ETCs) of which the ETC-Nature Protection and Biodiversity is the most relevant to RINCIS. The ETCs are funded by the EEA on a project or work-packet basis, and as well by specific national supporting funds and participation of partners (in-kind) on projects of mutual interest. The UK Centre for Ecology and Hydrology is for example an active partner with ETC-NPB.

Pan-European

A number of organisations are influential players in a full pan-European context. These include:

- United Nations Economic Commission for Europe (UNECE), based in Geneva, Switzerland
- EEA (in addition to its EU role)
- UNEP's Regional office for Europe (UNEP-ROE)
- Council of Europe.
- Intergovernmental Conventions and Agreements, e.g.
  - Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
  - Regional marine Conventions (the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, the Helsinki Commission (HELCOM), the Barcelona Convention, Mediterranean Action Plan (MAP));
  - Regional river conventions (Rhine, Oder, Elbe, Danube);
  - Pan-European Biological and Landscape Diversity Strategy (PEBLDS)
  - The national governments of European countries
- Non-governmental organisations which address and work on nature conservation in Europe, e.g.; the International Union for the Conservation of Nature (IUCN), WWF, Seas at Risk, Green-peace International, European Centre for Nature Conservation (ECNC), BirdLife International, Wetlands International, European Forum for Nature Conservation and Pastoralism (EFNCP), European Union for Coastal Conservation (EUCC), Europarc, Eurosite, Institute for European Environmental Policy (IEEP).

The UNECE leads the "Environment for Europe" process, an essential political framework for co-operation on environmental protection in Europe. It regularly brings together Environment Ministers and all organisations and institutions working with environmental issues in the region, including non-governmental organisations (NGOs) at pan-European conferences to formulate environmental policy.

The process began in 1991 with the first Ministerial Conference, which was held at Dobris Castle in the then Czechoslovakia. Environment Ministers from 34 European countries, the EC, the United States, Brazil, Japan, various UN bodies, governmental and non-governmental organisations and institutions were present. The conference discussed ways of strengthening co-operation to protect and improve the environment, and of long term strategies toward an environmental programme for Europe. The meeting represented the beginning of a pan-European approach to tackle the continent's environmental problems.

The latest meeting within the process took place in Aarhus, Denmark, in June 1998. The next conference in the 'Environment for Europe' conference series will be held in Kiev, Ukraine, in 2003.

The Pan European Biological and Landscape Diversity Strategy (PEBLDS) is a direct result of the "Environment for Europe" process and represents part of the European response to the United Nations Convention on Biological Diversity.

The EEA takes on a pan-European mandate at times, especially with regard to the production of assessment of the "State of the European Environment", sometimes referred to as the "Dobris Process", and assisting with harmonization for potential accession states.

7.10.3 Nature Conservation Policy-Making

European Union

There are three main institutions involved in decision-making in the EU. The European Parliament elected by the peoples of the Member States, the Council which represents the governments of the Member States and the Commission which is the executive and the body having the right to initiate legislation. These institutions are supported by other bodies such as the Economic and Social Committee and the Committee of the Regions (advisory bodies which help to ensure that the positions of the EU's various economic and social categories and regions respectively are taken into account).

An example of how these policy-making bodies interact in the context of biodiversity conservation policy is the development of the EC Biodiversity Strategy and Action Plans.

The Council of Ministers decided at a meeting on 18 December 1995 that "with regard to matters within the field of its competence and in close co-operation with its Member States, the Community should elaborate a Community Strategy to identify gaps in the European Community conservation policy, and to promote biological diversity into the policies of the Community, complementary to strategies, programmes and plans of the Member States, in order to ensure the full implementation of this Convention".

A request was sent to the European Commission to develop such a strategy and action plans setting out the ways and means for the implementation of this strategy. These have been developed and adopted by the commission but are subject to approval by the European Parliament.

The EC Biodiversity Strategy was adopted by the Commission in 1998 and endorsed by the Council and Parliament in the same year. The strategy aims to, "*anticipate, prevent and attack the causes of significant reduction or loss of biodiversity at the source. This should help both to reverse present trends in biodiversity reduction or losses and to place species and ecosystems, which includes agro-ecosystems, at a satisfactory conservation status, both within and beyond the territory of the Union*".

Pan-European

At the wider European level there are not the formalised structures and procedures as laid down by the Treaties establishing the European Union. Instead policy-making is mainly carried out through the negotiation of bilateral or multilateral agreements, and through discussion and agreement in for a such as the "Environment for Europe" process. In addition the Pan-European Biological and Landscape Diversity Strategy process remains an attempt to bring focus to pan-European priorities in policy and action.

7.10.4 Policy and Legislative Instruments

European Union

The European Community Biodiversity Strategy defines a precise framework for action, by setting out four major themes and specifying sectoral and horizontal objectives to be achieved. The Strategy focuses specifically on the integration of biodiversity concerns into relevant sectoral policies, in particular: conservation of natural resources, agriculture, fisheries, regional policies and spatial planning, forests, energy and transport, tourism, development and economic co-operation.

With the adoption of the Biodiversity Strategy, the Community took the first step towards implementing its most important obligation as a Party to the United Nations Convention on Biological Diversity (CBD). The second step, foreseen in the Strategy, is the development and implementation of Action Plans and of other measures affecting the policy areas concerned. The sectoral Action Plans define concrete actions and measures to meet the objectives defined in the strategy, and specify measurable targets. On behalf of the Community the European Commission has issued a communication presenting four specific "sectoral" Biodiversity Action Plans on:

- Conservation of Natural Resources
- Agriculture
- Fisheries
- Economic and Development Co-operation.

Development of the Action Plans has been led by the Commission services responsible for the policy areas concerned. These services worked in close co-ordination with each other and with those overseeing biodiversity policy, as well as with the European Environment Agency and Member State experts. NGOs and other stakeholders also participated in the drafting process.

The Action Plans have been developed in the light of the specific instruments and procedures that apply to these sectoral policies. They also set out how to identify appropriate indicators for monitoring and evaluating implementation.

There is obvious overlap between the Action Plans since the different policy areas at which they are targeted impinge on each other. Coherent and co-ordinated implementation will therefore be crucial.

The European Council's proposal for a European Union Sustainable Development Strategy was adopted by the Commission on the 15th May 2001. The proposal forms part of the European Union's preparatory work for the 2002 world summit on sustainable development (Rio + 10). The strategy is designed to be a catalyst for policy-makers and public opinion, to change society's behaviour. It is built around cross-cutting proposals, measures to attain long-term objectives and progress reviews. The long-term objectives of the strategy include more responsible management of natural resources.

The new Sixth Environmental Action Programme, adopted in May 2001, is another important policy instrument in the context of EC nature conservation policy. It provides the environmental component of the Community's strategy for sustainable development. The Programme effectively sets the environmental objectives and priorities that will be an integral part of the European Community's strategy for sustainable development. The programme sets out the major priorities and objectives for environment policy over the next five to ten years and details the measures to be taken. The programme identifies four priority areas:

- Climate Change
- Nature and Biodiversity
- Environment and Health
- Natural Resources and Waste

The Programme links activities relating to Agenda 21, the CBD and the UNECE with the activities of the Commission. It continues to pursue some of the targets from the Fifth Environment Action Programme, which came to an end in 2000, but goes further, adopting a more strategic approach

The principal types of legislative instrument in the European Community are Regulations, Directives, Decisions, Recommendations and Opinions:

- *Regulations* are directly applicable and binding in all EU Member States without the need for any national implementing legislation.
- *Directives* bind Member States as to the objectives to be achieved within a certain time-limit while leaving the national authorities some choice in the form and means to be used. Directives

have to be implemented in national legislation in accordance with the procedures of the individual Member States.
- *Decisions* are directly binding in all their aspects on the party to which they are addressed. Thus, decisions do not require national implementing legislation. A decision may be addressed to any or all Member States, to enterprises or in some cases to individuals.
- *Recommendations* and *opinions* are not binding.

In the area of biodiversity conservation there are numerous legislative instruments in force, the most significant of which are:

- the Birds Directive (Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds)
- the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- the Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy)

As well as these three instruments, which are unique to the EU, there are numerous instruments which incorporate the provisions of international treaties and agreements into EU law, such as; "Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein", which incorporates the provisions of the Convention on International Trade in Endangered Species

Pan-European

In the wider European region policy and legislative instruments largely take the form of conventions and agreements of a multilateral or bilateral nature. An example of which is the Bern Convention on the Conservation of European Wildlife and Natural Habitats. 45 European and African States as well as the European Community are parties to this convention.

The Pan-European Biological and Landscape Diversity Strategy endorsed at the Third Pan-European Conference of Ministers of the Environment establishes an international framework for co-operation on implementation of nature conservation policy in Europe. The strategy seeks to improve on implementation and co-ordination of existing measures.

Another example is the Sofia Biodiversity Initiative that also arose as a result of the "Environment for Europe" Conference in Sofia in 1995. At this conference four initiatives for the implementation of the Environmental Action Programme (EAP) for Central and Eastern Europe (CEE) were launched: Environmental Impact Assessment, Economic Instruments, Local Air Pollution and Biodiversity.

The main goals of the Sofia Biodiversity Initiative (SBI) are to link together the EAP and PEBLDS process in the CEE region, to facilitate a sub-regional response to the Pan-European challenge in the field of conserving and restoring biological diversity, taking into consideration the specific conditions in CEECs. This is planned mainly through exchange of experience between the 15 CEECs, involving local communities and NGOs, developing and implementing biodiversity policies, as well capacity building at national and local level. This work contributes in a complementary way to the efforts of the EU and other European countries in the field of Biodiversity Conservation.

7.10.5 Principal EU and Pan-European Nature Conservation Information Sources

EC Clearing-House Mechanism

The principal online source for biodiversity conservation information in the EU is the European Community Biodiversity Clearing-house Mechanism (EC-CHM). The web site is mainly built as a portal site, with the core of its content stored in a metadatabase. This is a directory of information sources that is accessible by way of a free keyword search as well as through pre-cooked searches by

simply browsing the site, starting from the central part of the front page. The aim for most services is to be accessible to primarily the EC desk officers and national CHM experts, for uploading news and documents or updating their own address information.

The EC-CHM web site is updated by the European Centre for Nature Conservation (ECNC) under instruction from the European Environment Agency (EEA) that decides the content of the site on the basis of advice from a taskforce group. The taskforce group is made up of representatives from the Member States, the European Commission, the European Topic Centre on Nature Protection and Biodiversity, the CBD Secretariat, and other specialist organisations such as UNEP-WCMC. The long-term intention of the EC-CHM is to become the prime access point for information on biodiversity and its conservation in the EU.

Europa Website

The Europa web site of the European Union itself also contains useful information relating to biodiversity conservation, for example information relating to Natura 2000 contained within the web pages of the Environment Directorate-General. Other relevant web-based information is also held by the Agriculture, Development, Fisheries and Regional Policy Directorates-General. Responsibility for the information contained in these pages lies with the appropriate unit of each Directorate-General. So for example information relating to the EC Biodiversity Strategy and Action Plans and their implementation is the responsibility of the Nature and Biodiversity Unit of Directorate B (Environment quality and natural resources), of the Environment Directorate-General. Some Directorates-General have a central information service that collaborates with the appropriate unit of each DG to update online information. There is also a central law databases - see Cluster 5 on environmental law.

The European Environment Agency and EIONET

The European Environment Agency (EEA) also provides important biodiversity conservation information on its own web site. Examples of this are the reports "Europe's Environment ". These are major reports on the European environment prepared by the European Environment Agency in co-operation with the UNECE, UNEP, OECD, Council of Europe, WHO, IUCN and Eurostat, together with the individual countries of Europe. The report covers the state of the environment in almost all of Europe's nearly 50 States and is aimed at all those concerned with the environment professionally, as well as those with a more general interest. It is intended to provide an objective basis for planners and developers involved in policy-making and programming in environment and sectoral fields.

Another important information source is the European Nature Information System (EUNIS), developed by the EEA-ETC/NPB, which consists of a central unit integrating data models on species, habitats and sites, several secondary databases which are managed by different partners; and an increasing number of satellite databases. EUNIS has two main aims:

- to facilitate use of data by promoting harmonization of terminology and definitions
- to be a reservoir of information on European environmentally important matters

The Topic Centre also manages the information on Natura 2000 sites on behalf of the commission. Information is confidential until released by Member States, so this database of key conservation sites is not currently open-access.

Linking many of these EU nature conservation information services is the European Environment Information and Observation Network (EIONET). EIONET is a collaborative network of the European Environment Agency and its Member Countries, connecting National Focal Points in the EU and accession countries, European Topic Centres, National Reference Centres, and Main Component Elements. These organisations jointly provide the information that is used for making decisions for improving the state of environment in Europe and making EU policies more effective. EIONET is both a network of organisations and an electronic network (e-EIONET).

The EIONET Institutions are:

- National Focal Points (NFP) (Institutions responsible for national co-ordination of activities related to the EEA Work Programme). The European Environment Agency is the first European Union body to welcome countries seeking accession to the EU as full members from the beginning of 2002. The current number of EEA member countries is 31. In each country, a National Focal Point (NFP) is responsible for co-ordinating the activities related to EEA work programme.
- 195 Main Component Elements (MCE) (Main institutions of the national networks, which are regular collectors and suppliers of environmental data)
- 285 National Reference Centres (NRC) (Institutions among MCEs nominated to co-operate with EEA on specific topics)
- 5 European Topic Centres (ETC) (Consortia, with one leading institution, contracted by EEA to execute tasks in the Work Programme)

The Global Biodiversity Information Facility (GBIF)

GBIF intends to assemble biodiversity databases and information technology tools enabling users to navigate and put to use the vast quantity of biodiversity information to produce national economic, environmental and social benefits. At the heart of GBIF will be a catalogue of the scientific names of all the World's species. Longer-term goals for GBIF are to develop digital catalogues of natural history specimen collections in "interoperable" form, develop common standards for data access and cataloguing between institutions, and provide capacity building taxonomy, collection management, and related information management. Most of its activities will be carried out within member countries, supported by their national funding programs.

The European Network for Biodiversity Information (ENBI) aims to manage an open network of relevant biodiversity information centres in Europe and other countries of the western European Palearctic region, and, in particular, to include all European national nodes of the Global Biodiversity Information Facility (GBIF). Its objective is to develop a strong network that is capable of organising the complementary activities of its members in order to add value to the contribution of the national nodes and other European contributions to the GBIF. ENBI will identify priorities that require a common approach at the European scale. A proposal is currently in the making and on this temporary site you will find essential information about ENBI.

NATLAN

The EEA's NATure/LANd Cover Information Package (NATLAN) is an information package designed for viewing and distributing information and applications on topics like land cover and nature. A lot of information on the environment is linked to nature sites and areas, e.g. the geographical distribution of forests. The purpose of NATLAN is to give public access to this information with the help of maps. NATLAN allows navigation and viewing of information on different topics for any chosen area in Europe. It contains simple tools for viewing, zooming and downloading. Explanatory text and reports relevant to the understanding and use of the data are included.

The Regional Environmental Centre for Central and Eastern Europe (REC)

REC is a non-advocacy, not-for-profit organisation whose mission is to assist in solving environmental problems in Central and Eastern Europe (CEE). The Centre fulfils its mission through encouraging co-operation among non-governmental organisations, governments and businesses, supporting the free exchange of information and promoting public participation in environmental decision-making. The REC was established in 1990 and is legally based on a Charter signed by the governments of 25 countries and the European Commission, and on an International Agreement with the Government of Hungary.

UNEP-GRID Centres

There are also several Global Resource Information Database (GRID) Centres in the European region. The Global Resource Information Database (GRID) is a world-wide network of 15 environmental data centres managed by UNEP's Division of Early Warning and Assessment (DEWA) from its headquarters in Nairobi, Kenya. The European centres are GRID-Arendal, GRID-Budapest, GRID-Esbjerg (in Denmark), DEWA/GRID-Geneva, which has a UNEP staff presence, GRID-Moscow, GRID-Warsaw and the Blue Plan office of UNEP's Mediterranean Action Plan (MAP) in Sophia Antipolis, France.

GRID aims to provide and facilitate access to high-quality environmental data and information for decision making and policy setting, and to support UNEP's environmental assessment and reporting, networking and early warning activities. Typically, GRID centres specialise in the preparation and provision of value-added environmental information products using tools such as remote sensing, Geographic Information Systems, and by developing client-specific databases and Internet websites. The GRID Centres usually work with other UN organisations or National governmental conservation agencies.

Strategy Guide

An important Pan-European nature conservation information source is the Strategy Guide, designed as a clearing-house for the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) to carry news and background information of the Strategy activities, news of its participating organisations and other contacts and general announcements concerning related activities. The PEBLDS was an initiative of the Council of Europe and as such has a wide membership including both the EU Member States and Countries in the wider European region.

Regional action within Europe relating to the Pan-European Biological and Landscape Diversity Strategy is presently focused through three governmental processes:

1. that under the Convention on Biological Diversity;
2. that under the "Environmental Action Programme for East and Central Europe" as part of the "Environment for Europe" ministerial process; and
3. that under the European Union.

The Strategy seeks to ensure close harmonization between these processes.

7.10.6 Issues and Concerns

- The relationships between the principal players are complex. Jurisdictions and interests overlap, for example, the EEA has both an EU mandate and a pan-European role.

- Streamlining of reporting is a growing concern given the requirements not only of the EC, but of regional and global MEAs, and of statistical organisations.

- The EU is a party to (some) MEAs in a status similar to a "state" and hence has both reporting and implementation obligations in addition to member states..

- The identified directions for environmental policy in Europe require a wider perspective and hence a need to consider nature conservation in the context of other policies such as agriculture, fisheries, forests and water.

7.10.7 Current Harmonization Initiatives

European Union

The principal harmonizing policy instrument in the context of EC Policy Development is the 6th Environmental Action Plan. This plan incorporates Agenda 21 and connects this to both the

Convention on Biological Diversity and the UNECE with the activities of the Commission. The new programme stresses the need for Member States to better implement existing environmental laws

Strategically a certain degree of inter-sectoral harmonization is incorporated within the framework of the Sustainable Development Strategy of the European Union. It contains a number of concrete proposals for how the European Union can improve its policy-making to make it more coherent and focussed on the long term, as well as a number of specific headline objectives and the measures needed to achieve them.

Recently the European Commission has made a commitment, at the request of the Member States, not to develop new reporting requirements, but to work on consolidating those that currently exist.

It should be noted that besides international initiatives to harmonize reporting, a number of mechanisms are enshrined in Directives and Regulations promoting such efforts. Where no such obligations exist there is a reluctance among the Member States to carry out such harmonization.

Nevertheless the Commission has recently commissioned a report on complementarity between the National Biodiversity Strategies and Action Plans of the member states. This report could serve to help ensure harmonization between the actions taken by the European Union institutions and the Member States in the area of Biodiversity Conservation.

European Environment Agency

Additionally EUNIS is involved in the development of a number of harmonization tools;

- Synonyms Module – development of a system of correspondence between species and their synonyms for the internal management of the EUNIS database and for the wider use of EUNIS data. The EUNIS Species Database is now available online at the EEA web site and incorporates the synonyms module. This database includes relevant information on a selection of Plants and Invertebrates species (at least those listed under the EC Habitats and Birds Directives, and under the Bern Convention) and all European Vertebrates. The EUNIS Species Database will soon integrate the Flora Europaea Database, adding a further 42287 records.

- EUNIS Habitat Classification – development of a common reporting language on habitat types at European level: The EUNIS Habitat Classification builds upon previous initiatives (CORINE-Biotopes followed by the Palearctic Habitats Classification), but introduces agreed-upon criteria for the identification of each habitat unit and provides a correspondence with other classification-types (the two above mentioned, CORINE Land-Cover typology, Habitats Directive Annex I, Nordic classification system, and potentially other national systems). This database is now available online.

- Common Database on Designated Areas – a joint project between EEA, Council of Europe and UNEP-WCMC to co-ordinate and streamline information on designated areas resulting from various legal frameworks, whether at international, Community or national level. The sites are listed according to the official designations at national level. This list of designation types has about 600 individual designations registered according to national or sub-national law (of which about 350 for EEA member countries).

- The EUNIS 50x50 km UTM grid – development of a 50x50 km grid model following the adoption of common principles for a common European Chorological Reference Grid (CGRS) during a meeting between ETC/NPB and European atlases of species in 1998. These atlases include Atlas Flora Europaeae, Atlas of Amphibians and Reptiles in Europe, Atlas of European Breeding Birds, European Mammal Atlas and European Invertebrates Survey. The model will be one of the main EUNIS tools to refer any spatial data at European level.

The European Environment Agency is working to develop an inventory of the requirements for Member States to monitor and report environmental data. A reporting obligations database (ROD) has been developed and populated for the subject areas of air, water and waste. JNCC recently contracted UNEP-WCMC to undertake further work to identify the reporting obligations placed on countries of the European Union by international treaties and European Commission Directives related to biodiversity. JNCC will use the outputs of this work outputs to identify commonalities and overlaps in the reporting obligations, identify opportunities to make reporting to international instruments more efficient.

Geographically the scope is restricted to instruments that place obligations on the 15 member states of the European Union. It therefore includes global treaties and regional international instruments that affect one or more member states. A preliminary version of the Reporting Obligations Database is now available through the EEA Website.

Pan European

The Pan-European Biological and Landscape Diversity Strategy also seeks to harmonize biodiversity conservation by promoting a consistent approach and common objectives for national and regional action to implement the Convention on Biological Diversity.

The Strategy introduces a co-ordinating and unifying framework for strengthening and building on existing initiatives. It does not aim to introduce new legislation or programmes, but to fill gaps where initiatives are not implemented to their full potential or fail to achieve desired objectives. Furthermore, the Strategy seeks to more effectively integrate ecological considerations into all relevant socio-economic sectors, and will increase public participation in, and awareness and acceptance of, conservation interests.

The work plan of the PEBLDS comprises three elements:

Programme Element I. Enhancing the implementation of the Convention on Biological Diversity in Europe through the PEBLDS process
Programme Element II. Promoting and supporting specific European actions, initiatives and innovations
Programme Element III Building capacity of CEE/NIS countries in the conservation and sustainable use of biodiversity

Overall the implementation of the Strategy is carried out by the activities of the Strategy bodies; the Strategy Council and its Bureau (formally the Executive Bureau), through its national members and regional groupings, the joint Strategy Secretariat of Council of Europe and UNEP, through the Action Theme co-ordinators in implementing the Action Theme work programmes, and by the Innovative funding expert group under the Swiss Government and ECNC.

The Strategy's vision for the future is to achieve conservation and sustainable use of biological and landscape diversity for the whole continent of Europe and all its regions within 20 years

Other PEBLDS related harmonization activities underway in the region include UNEP's Biodiversity Service. This service was established by a consortium of four organisations; the United Nations Environment Programme (UNEP), IUCN - the World Conservation Union, the European Centre for Nature Conservation (ECNC) and the Regional Environmental Centre for Central and Eastern Europe (REC). The Biodiversity Service seeks to promote and facilitate the implementation of the Convention on Biological Diversity in CEE/NIS countries by providing assistance in implementing national biodiversity strategies and action plans.

European Monitoring and Indicator Framework

A further harmonization initiative developed as a result of the PEBLDS is the European Biodiversity Monitoring and Indicator Framework (EBMI-F). This initiative aims to enhance the possibilities for

creating more synergy among past, present and future biodiversity monitoring-to-reporting efforts at the European level in order to reach higher efficiency and effectiveness in communicating the state of, and trends in, Europe's biodiversity to the policy-makers concerned.

The Council of the PEBLDS has requested ECNC and EEA to develop and co-ordinate EBMI-F in order to support the implementation of PEBLDS. It will provide input into the next Ministerial Conference 'Environment for Europe' in Kiev, 2003. A proposal for EBMI-F has been developed jointly by ECNC and EEA.

CHM Implementation in Europe

At the first 'Biodiversity in Europe' conference in Riga a discussion paper on 'Future work on scientific and technical co-operation and the Clearing-House Mechanism' recommended further steps to reach more co-operation and synergy between the various CHM developments in Europe. This included developing a Pan-European CHM with involvement of PEBLDS members and EC CHM Steering Committee and by ensuring adequate financial and human resources. These recommendations were supported by an analysis report presented to the PEBLDS Council in May 2001. Co-ordination between the CBD-CHM, the Strategy Guide and the EC CHM and possibly also the ENBI and GBIF is currently under review by EEA, ECNC, UNEP and the Council of Europe.

At the Pan-European workshop 'Building the CHM Partnership', held in Bonn in September 2001 and attended by national CHM representatives from across Europe it was recommended to start a pan-European CHM co-ordination initiative in order to optimise scientific and technical co-operation, information exchange and networking. This should focus on concrete 'face-to-face' co-operation, a feasibility study and a pan-European Steering Committee.

7.10.8 Recommendations

Strategic:

European policy drivers are of high importance to the UK. As can be seen by the preceding analysis, nature conservation policy development and implementation in Europe is complex, and probably unnecessarily so. The following recommendations indicate the general strategic directions that should be sought to assist with rationalising nature conservation (and related) information systems in Europe. European issues cross-cut international issues and responsibilities and so note should be taken of the European consequences of more particular recommendations in other clusters.

Strategic recommendation 10.1: Support EC policy directions on the environment that seek to identify first the important policy decision needed, then the key information required to develop the policy and finally the information needed to assess the effectiveness of implementation measures.

Strategic recommendation 10.2: Support efforts that contribute to the reduction, streamlining and simplification of reporting within Europe and the integration of European reporting with reporting to MEAs.

Strategic recommendation 10.3: Support the development of harmonization tools that make nature conservation information comparable and useable, and streamlining tools that facilitate the process of information collection and use.

Practical:

Recommendation 10.1: Develop ways to improve connections between sustainable development and socio-economic aspects of "environment" with considerations of nature conservation. One implementation option is to constitute inter-departmental committees or similar bodies that consider the nature conservation consequences of policy (UK and EC) in agriculture, transport, forestry, fisheries, cultural heritage, development assistance and so on, and the information required to understand and inform on those impacts.

Recommendation 10.2: Improve UK participation in EIONET to provide better access and exposure to UK National Reference Centres (noting that currently the information on the UK EIONET node website is out of date).

Recommendation 10.3: Actively support the development of harmonization tools, particularly those associated with EEA and EUNIS. This means increased partnerships (UK NRCs) with the ETC/NPB particularly with respect to the harmonization initiatives of the EUNIS Habitat Classification (CEH is currently working on this), the Common Database on Designated Areas (UNEP-WCMC is working on this), and the synonyms module of the EUNIS Species Database. In this context, it would also be useful to promote compatibility of EU harmonization with global efforts (e.g. on species synonymy) in order to reduce duplication of effort.

Recommendation 10.4: Support efforts by the EEA to reduce and streamline reporting, for example, by continuing to support the development, implementation and use of the Reporting Obligations Database (Nature Conservation component researched by JNCC and UNEP-WCMC), while noting previous recommendations made by JNCC and UNEP-WCMC on this project.

Recommendation 10.5: Consider ways to reduce and streamline UK reporting (and other information-related obligations) to MEAs, the EC, the Council of Europe, OECD and other bodies. One step to achieving this may be to develop a tabulation of all nature conservation reporting obligations placed on the UK (based on the EU wide database already prepared by EEA) and use this to design national information systems to support these reporting requirements in a rational manner.

Recommendation 10.6: Ensure there are close ties and appropriate integration between the UK Biodiversity Clearing-House Mechanism, the EC CHM, and the Strategy Guide.

Recommendation 10.7: Make full use of national centres of expertise in contributing to European initiatives, for instance consider how the well-developed and respected monitoring protocols of the ECN could contribute to monitoring of SPAs and habitats under Natura 2000.

Recommendation 10.8: Support the EEA Data Service and other EEA-led efforts to increase access to the datasets it compiles, and contribute UK data and expertise as appropriate.

Recommendation 10.9: Avoid committing significant time to efforts that are not central to EU policy and those that are redundant or peripheral. To this end it might be useful to maintain a central inventory of nature conservation information initiatives both in the UK and in Europe – for instance an extension of the RINCIS database.

Recommendation 10.10: Encourage and support periodic review of EEA data collection to ensure the relevance of data holdings to policy generation and review, including review of formats of information delivery.

7.11 CROSS-CUTTING RECOMMENDATIONS

7.11.1 Introduction

A number of practical recommendations arise that are not strictly limited to within-Cluster and reflect identifies strategic themes of integration and a "top down" approach, and the need across the board for harmonization tools and means to improved access to information. These recommendations are collected in this section.

7.11.2 Recommendations

Cross-cutting recommendation 1: Encourage convention secretariats, international NGOs, UN organisations, and intergovernmental organisations to develop tools for integrated access to case studies and good practices in nature conservation and means to make these more accessible and searchable through improved metadata.

Cross-cutting recommendation 2: Encourage convention secretariats to review the extent to which current information sources could be used to meet present needs, including assessing the effectiveness of the treaty, and at the same time articulate information needs and invite major data custodians to review how they can support these requirements.

Cross-cutting recommendation 3: Encourage the agencies that hold policy-relevant information resources to provide improved metadata to such facilities as the EEA's metadata services in order to make information sources better known and available.

Cross-cutting recommendation 4: Work with the EEA and other bodies concerned with environment metadata to incorporate improved quality management information into metadata profiles and the WebCDS metadata tool.

Cross-cutting recommendation 5: Encourage the improvement of standardised vocabularies for indexing and searching for information, for instance by supporting the addition of biodiversity-related terms to GEMET, and seeking further harmonization of GEMET with UNEP's EnVoc.

Cross-cutting recommendation 6: Encourage the EEA to undertake a thorough review of the EC-CHM both to assess functionality and content, and to ensure that it is meeting the needs identified by the Steering Committee and Task Force meetings and the feasibility study.

Cross-cutting recommendation 7: Promote improved linkages between biodiversity databases within the UK and international information services and networks, particularly those national databases sponsored by Government or managed by Government agencies to meet their own needs.

8 RECOMMENDATIONS FOR THE FUTURE OF THE REFERENCE GUIDE

8.1 INTRODUCTION

The current pilot system for the Reference Guide is implemented on the UNEP-WCMC website and has two components:

- a *Microsoft Access®* database that holds the structured profiles of the information sources; and
- an interactive, online query website driven by *Macromedia Coldfusion®* on a *Microsoft Internet Information Server* platform.

The information within the system consists of 187 standard format descriptions of information sources and services, the structure of which can be found in Annex II. Information has been compiled during the course of the project, but there are currently no resources or plans to maintain or expand this data after the completion of the project. A "live" online service that is continuously up-dated was a clear preference that came from the Workshop consultations. This section is intended to present some options for providing a viable on-going future for the Reference Guide.

Whilst the current system (software, server and available bandwidth) is suitable for a demonstration, it would require upgrading for delivery of a production level service, if extensive use was to be made. In this respect it should be noted that any part of the service can be independently upgraded to remove bottlenecks as they occur. For instance a more powerful database would speed up the query option if this were to become a limitation on use of the service.

8.2 ENHANCEMENTS AND IMPROVED FUNCTIONALITY

To date there has been relatively little feedback from users on the utility and functionality of the pilot Online Reference Guide. We believe, however, that some or all of the following enhancements would improve services to the user.

- Expanded search options - additional criteria and free text searching within the "Information Content" field
- Improved "Geographic scope" query, with the capability to conduct inclusive and exclusive searches
- Ability to export profiles in formats other than HTML, for example Word documents, PDF files etc.
- Ability to carry out a free-text search within an identified cluster of websites, as was shown in an earlier demonstration for the various European websites
- Improved searching through automated thesaurus support - that would prompt users with suggestions for alternative terms, and narrower and wider terms.
- Providing for user feedback and correction of profiles, for instance by an option for users to contribute information where their knowledge shows inconsistencies with profiles, and/or to give an opinion on the value of information sources or services
- Improving information content by increasing the scope of the coverage, e.g. to include more sustainable development and resource use areas
- Improving the information content by adding additional information fields on the existing sources and services

- Providing an online updating tool, which would allow anyone with approval to make changes to the underlying database (these could be moderated prior to display)

- Automating the synchronisation of database updates with the online Reference Guide

Deciding which of these enhancements are top priorities is best done after a period of user experience, to provide an understanding of how the service is used, for what purposes, and what difficulties were encountered and further needs identified.

The extent to which the system would need technical enhancements for performance depends almost entirely on the workload or traffic. The current demonstration system can easily handle light workloads, but access rates of greater than 10,000 per week, would require upgrading, potentially for both the database software and the bandwidth capacity of the communications facilities. Again this depends on monitoring and reviewing usage.

8.3 DATA MAINTENANCE CONSIDERATIONS

To ensure that the *Reference Guide* remains useful and current it will need to be reviewed and updated on a regular basis. Updates are required for one or more of the following reasons:

- change in the information source/service available
- change in the URL or other contact details
- addition of new information sources and services

This work could be carried out through research by an identified individual, and/or the users of the Reference Guide could be encouraged to submit further information. With this in mind, it should be noted that the Reference Guide software could be modified so that the updates could be made by someone (or several different people) not at UNEP-WCMC even if the database itself remained on the UNEP-WCMC Website.

8.4 BUILDING AND BROADENING THE USER BASE

If the Reference Guide is a useful service, then it is important to ensure that all those involved in nature conservation policy development and implementation at the national level are aware of what the service is, and what it can do for them. This implies a need for DEFRA to communicate information about the Reference Guide within the appropriate departments and agencies.

Although intended primarily to support UK policy-makers, the Reference Guide may also be of interest to a wider audience across Europe or even globally. This raises the issue of broadening the scope, in addition to wider advertising of the service. Already the CBD CHM has expressed interest in having the service available (linked) through their facilities.

8.5 ALTERNATIVE HOSTS AND MODALITIES OF MAINTENANCE

From a technical viewpoint, the system is modular with the database maintenance and web delivery currently separate. It is feasible that the maintenance of the database could be undertaken by one agency, and the web delivery by another.

Three potentially good options for hosting the site are: DEFRA, UNEP-WCMC, and JNCC (in conjunction with the UK Clearing-House Mechanism). Some advantages and disadvantages of each of the three options are outlined below:

Option	Advantages	Disadvantages
DEFRA	Close to/controlled by primary intended users	Lack of familiarity with the information sources for update
	No need to accommodate other needs and uses	Does not take advantage of value of wider international use
	Possibly lowest cost	Possible technology issues
JNCC/UK CHM	Used to providing for information needs of policy-makers	Not fully familiar with information sources and services
	Association with UK CHM could provide wide audience use in UK and Europe	May not take full advantage of value of wider international use
	Good potential to interest third parties	Associated costs of integration with, or conversion to, existing technology may be higher
UNEP-WCMC	Very familiar with and close to information sources and services	Not close to day-to-day needs of policy-makers
	Well positioned to up-date information	Costs of technology up-grade and human resources for data maintenance would need to be explicitly identified
	Experienced with providing similar services	
	Excellent potential to interest third parties in maintenance and development (possible cost offsets)	

Data maintenance can be considered in terms of three options as well. The following represent very preliminary rough estimates:

- *Basic maintenance:* One person for one day a week could quite effectively maintain the existing database information, without any significant improvement.

- *Steady improvement:* One person half time could maintain a data resource of this size and as well begin to augment both the quantity and quality of the data available. They would also be able to facilitate comments and additions by users.

- *Proactive expansion:* This would require one to two full-time positions and would permit broadening of the scope and content by adding improvements to the system (as described earlier), and actively seeking new sources to expand into a Europe-wide or global system with greatly improved coverage and linkages to the MEAs and CHMs. Technology enhancements would also be required.

As noted above, the choice of a host organisation depends on usage and intended purpose and audience, and this depends on assessment of use and potential use, and feedback from users. For example, it may be possible to develop a "consortium" approach to maintenance of the information and provision of the service.

We are happy to discuss with other possible hosts the transfer of the Reference Guide to their website if this were thought to be appropriate. Meanwhile it is important to appreciate that in the future there will be associated ongoing operational costs with delivering the database. Even the provision of the current service at UNEP-WCMC would require, after an agreed time, payment of costs in maintaining the database on our systems, web server provision and bandwidth costs. In addition, if the current system is extended to include a free text search of the online sources additional costs will be incurred.

8.6 RECOMMENDATIONS

It is clear that the level of use of the Reference Guide to date is too low to assess what its potential is, and it is therefore premature to define its future. The following recommendations are therefore concerned with both user review and feedback, and development of costed plans for the future implementation of the Reference Guide – if this is what the outcome of the review foresees.

Decision on the future of the Reference Guide should be postponed until a review has been carried out with potential users and options for collaboration with other organisations in delivering this service have subsequently been explored more thoroughly.

DEFRA should promote the use of the Reference Guide amongst those departments and agencies responsible for the development and implementation of nature conservation policy in the UK.

DEFRA should collaborate with a qualified external agency in carrying out a review of the Reference Guide with potential users, both within the UK and elsewhere, to identify to what extent the Reference Guide is a valuable service, and if it is how best to improve it.

DEFRA should commission a study to explore the possibility of a future collaborative approach to the delivery of the Reference Guide with other capable organisations, once the review with potential users has been carried out and there is a better understanding of the potential of the service, including developing a costed strategy and proposal for the future of the Reference Guide.

UNEP-WCMC, with the experience in conducting this project and involvement with other related initiatives, is well qualified to assist DEFRA in the above reviews and study, and would be interested in future participation in enhancing and expanding the scope of the Reference Guide.

With the adoption of the Biodiversity Strategy, the Community took the first step towards implementing its most important obligation as a Party to the United Nations Convention on Biological Diversity (CBD). The second step, foreseen in the Strategy, is the development and implementation of Action Plans and of other measures affecting the policy areas concerned. The sectoral Action Plans define concrete actions and measures to meet the objectives defined in the strategy, and specify measurable targets. On behalf of the Community the European Commission has issued a communication presenting four specific "sectoral" Biodiversity Action Plans on:

- Conservation of Natural Resources
- Agriculture
- Fisheries
- Economic and Development Co-operation.

Development of the Action Plans has been led by the Commission services responsible for the policy areas concerned. These services worked in close co-ordination with each other and with those overseeing biodiversity policy, as well as with the European Environment Agency and Member State experts. NGOs and other stakeholders also participated in the drafting process.

The Action Plans have been developed in the light of the specific instruments and procedures that apply to these sectoral policies. They also set out how to identify appropriate indicators for monitoring and evaluating implementation.

There is obvious overlap between the Action Plans since the different policy areas at which they are targeted impinge on each other. Coherent and co-ordinated implementation will therefore be crucial.

The European Council's proposal for a European Union Sustainable Development Strategy was adopted by the Commission on the 15th May 2001. The proposal forms part of the European Union's preparatory work for the 2002 world summit on sustainable development (Rio + 10). The strategy is designed to be a catalyst for policy-makers and public opinion, to change society's behaviour. It is built around cross-cutting proposals, measures to attain long-term objectives and progress reviews. The long-term objectives of the strategy include more responsible management of natural resources.

The new Sixth Environmental Action Programme, adopted in May 2001, is another important policy instrument in the context of EC nature conservation policy. It provides the environmental component of the Community's strategy for sustainable development. The Programme effectively sets the environmental objectives and priorities that will be an integral part of the European Community's strategy for sustainable development. The programme sets out the major priorities and objectives for environment policy over the next five to ten years and details the measures to be taken. The programme identifies four priority areas:

- Climate Change
- Nature and Biodiversity
- Environment and Health
- Natural Resources and Waste

The Programme links activities relating to Agenda 21, the CBD and the UNECE with the activities of the Commission. It continues to pursue some of the targets from the Fifth Environment Action Programme, which came to an end in 2000, but goes further, adopting a more strategic approach

The principal types of legislative instrument in the European Community are Regulations, Directives, Decisions, Recommendations and Opinions:

- *Regulations* are directly applicable and binding in all EU Member States without the need for any national implementing legislation.
- *Directives* bind Member States as to the objectives to be achieved within a certain time-limit while leaving the national authorities some choice in the form and means to be used. Directives

have to be implemented in national legislation in accordance with the procedures of the individual Member States.
- *Decisions* are directly binding in all their aspects on the party to which they are addressed. Thus, decisions do not require national implementing legislation. A decision may be addressed to any or all Member States, to enterprises or in some cases to individuals.
- *Recommendations* and *opinions* are not binding.

In the area of biodiversity conservation there are numerous legislative instruments in force, the most significant of which are:

- the Birds Directive (Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds)
- the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- the Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy)

As well as these three instruments, which are unique to the EU, there are numerous instruments which incorporate the provisions of international treaties and agreements into EU law, such as; "Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein", which incorporates the provisions of the Convention on International Trade in Endangered Species

Pan-European

In the wider European region policy and legislative instruments largely take the form of conventions and agreements of a multilateral or bilateral nature. An example of which is the Bern Convention on the Conservation of European Wildlife and Natural Habitats. 45 European and African States as well as the European Community are parties to this convention.

The Pan-European Biological and Landscape Diversity Strategy endorsed at the Third Pan-European Conference of Ministers of the Environment establishes an international framework for co-operation on implementation of nature conservation policy in Europe. The strategy seeks to improve on implementation and co-ordination of existing measures.

Another example is the Sofia Biodiversity Initiative that also arose as a result of the "Environment for Europe" Conference in Sofia in 1995. At this conference four initiatives for the implementation of the Environmental Action Programme (EAP) for Central and Eastern Europe (CEE) were launched: Environmental Impact Assessment, Economic Instruments, Local Air Pollution and Biodiversity.

The main goals of the Sofia Biodiversity Initiative (SBI) are to link together the EAP and PEBLDS process in the CEE region, to facilitate a sub-regional response to the Pan-European challenge in the field of conserving and restoring biological diversity, taking into consideration the specific conditions in CEECs. This is planned mainly through exchange of experience between the 15 CEECs, involving local communities and NGOs, developing and implementing biodiversity policies, as well capacity building at national and local level. This work contributes in a complementary way to the efforts of the EU and other European countries in the field of Biodiversity Conservation.

7.10.5 Principal EU and Pan-European Nature Conservation Information Sources

EC Clearing-House Mechanism

The principal online source for biodiversity conservation information in the EU is the European Community Biodiversity Clearing-house Mechanism (EC-CHM). The web site is mainly built as a portal site, with the core of its content stored in a metadatabase. This is a directory of information sources that is accessible by way of a free keyword search as well as through pre-cooked searches by

simply browsing the site, starting from the central part of the front page. The aim for most services is to be accessible to primarily the EC desk officers and national CHM experts, for uploading news and documents or updating their own address information.

The EC-CHM web site is updated by the European Centre for Nature Conservation (ECNC) under instruction from the European Environment Agency (EEA) that decides the content of the site on the basis of advice from a taskforce group. The taskforce group is made up of representatives from the Member States, the European Commission, the European Topic Centre on Nature Protection and Biodiversity, the CBD Secretariat, and other specialist organisations such as UNEP-WCMC. The long-term intention of the EC-CHM is to become the prime access point for information on biodiversity and its conservation in the EU.

Europa Website

The Europa web site of the European Union itself also contains useful information relating to biodiversity conservation, for example information relating to Natura 2000 contained within the web pages of the Environment Directorate-General. Other relevant web-based information is also held by the Agriculture, Development, Fisheries and Regional Policy Directorates-General. Responsibility for the information contained in these pages lies with the appropriate unit of each Directorate-General. So for example information relating to the EC Biodiversity Strategy and Action Plans and their implementation is the responsibility of the Nature and Biodiversity Unit of Directorate B (Environment quality and natural resources), of the Environment Directorate-General. Some Directorates-General have a central information service that collaborates with the appropriate unit of each DG to update online information. There is also a central law databases - see Cluster 5 on environmental law.

The European Environment Agency and EIONET

The European Environment Agency (EEA) also provides important biodiversity conservation information on its own web site. Examples of this are the reports "Europe's Environment ". These are major reports on the European environment prepared by the European Environment Agency in co-operation with the UNECE, UNEP, OECD, Council of Europe, WHO, IUCN and Eurostat, together with the individual countries of Europe. The report covers the state of the environment in almost all of Europe's nearly 50 States and is aimed at all those concerned with the environment professionally, as well as those with a more general interest. It is intended to provide an objective basis for planners and developers involved in policy-making and programming in environment and sectoral fields.

Another important information source is the European Nature Information System (EUNIS), developed by the EEA-ETC/NPB, which consists of a central unit integrating data models on species, habitats and sites, several secondary databases which are managed by different partners; and an increasing number of satellite databases. EUNIS has two main aims:

- to facilitate use of data by promoting harmonization of terminology and definitions
- to be a reservoir of information on European environmentally important matters

The Topic Centre also manages the information on Natura 2000 sites on behalf of the commission. Information is confidential until released by Member States, so this database of key conservation sites is not currently open-access.

Linking many of these EU nature conservation information services is the European Environment Information and Observation Network (EIONET). EIONET is a collaborative network of the European Environment Agency and its Member Countries, connecting National Focal Points in the EU and accession countries, European Topic Centres, National Reference Centres, and Main Component Elements. These organisations jointly provide the information that is used for making decisions for improving the state of environment in Europe and making EU policies more effective. EIONET is both a network of organisations and an electronic network (e-EIONET).

The EIONET Institutions are:

- National Focal Points (NFP) (Institutions responsible for national co-ordination of activities related to the EEA Work Programme). The European Environment Agency is the first European Union body to welcome countries seeking accession to the EU as full members from the beginning of 2002. The current number of EEA member countries is 31. In each country, a National Focal Point (NFP) is responsible for co-ordinating the activities related to EEA work programme.
- 195 Main Component Elements (MCE) (Main institutions of the national networks, which are regular collectors and suppliers of environmental data)
- 285 National Reference Centres (NRC) (Institutions among MCEs nominated to co-operate with EEA on specific topics)
- 5 European Topic Centres (ETC) (Consortia, with one leading institution, contracted by EEA to execute tasks in the Work Programme)

The Global Biodiversity Information Facility (GBIF)

GBIF intends to assemble biodiversity databases and information technology tools enabling users to navigate and put to use the vast quantity of biodiversity information to produce national economic, environmental and social benefits. At the heart of GBIF will be a catalogue of the scientific names of all the World's species. Longer-term goals for GBIF are to develop digital catalogues of natural history specimen collections in "interoperable" form, develop common standards for data access and cataloguing between institutions, and provide capacity building taxonomy, collection management, and related information management. Most of its activities will be carried out within member countries, supported by their national funding programs.

The European Network for Biodiversity Information (ENBI) aims to manage an open network of relevant biodiversity information centres in Europe and other countries of the western European Palearctic region, and, in particular, to include all European national nodes of the Global Biodiversity Information Facility (GBIF). Its objective is to develop a strong network that is capable of organising the complementary activities of its members in order to add value to the contribution of the national nodes and other European contributions to the GBIF. ENBI will identify priorities that require a common approach at the European scale. A proposal is currently in the making and on this temporary site you will find essential information about ENBI.

NATLAN

The EEA's NATure/LANd Cover Information Package (NATLAN) is an information package designed for viewing and distributing information and applications on topics like land cover and nature. A lot of information on the environment is linked to nature sites and areas, e.g. the geographical distribution of forests. The purpose of NATLAN is to give public access to this information with the help of maps. NATLAN allows navigation and viewing of information on different topics for any chosen area in Europe. It contains simple tools for viewing, zooming and downloading. Explanatory text and reports relevant to the understanding and use of the data are included.

The Regional Environmental Centre for Central and Eastern Europe (REC)

REC is a non-advocacy, not-for-profit organisation whose mission is to assist in solving environmental problems in Central and Eastern Europe (CEE). The Centre fulfils its mission through encouraging co-operation among non-governmental organisations, governments and businesses, supporting the free exchange of information and promoting public participation in environmental decision-making. The REC was established in 1990 and is legally based on a Charter signed by the governments of 25 countries and the European Commission, and on an International Agreement with the Government of Hungary.

UNEP-GRID Centres

There are also several Global Resource Information Database (GRID) Centres in the European region. The Global Resource Information Database (GRID) is a world-wide network of 15 environmental data centres managed by UNEP's Division of Early Warning and Assessment (DEWA) from its headquarters in Nairobi, Kenya. The European centres are GRID-Arendal, GRID-Budapest, GRID-Esbjerg (in Denmark), DEWA/GRID-Geneva, which has a UNEP staff presence, GRID-Moscow, GRID-Warsaw and the Blue Plan office of UNEP's Mediterranean Action Plan (MAP) in Sophia Antipolis, France.

GRID aims to provide and facilitate access to high-quality environmental data and information for decision making and policy setting, and to support UNEP's environmental assessment and reporting, networking and early warning activities. Typically, GRID centres specialise in the preparation and provision of value-added environmental information products using tools such as remote sensing, Geographic Information Systems, and by developing client-specific databases and Internet websites. The GRID Centres usually work with other UN organisations or National governmental conservation agencies.

Strategy Guide

An important Pan-European nature conservation information source is the Strategy Guide, designed as a clearing-house for the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) to carry news and background information of the Strategy activities, news of its participating organisations and other contacts and general announcements concerning related activities. The PEBLDS was an initiative of the Council of Europe and as such has a wide membership including both the EU Member States and Countries in the wider European region.

Regional action within Europe relating to the Pan-European Biological and Landscape Diversity Strategy is presently focused through three governmental processes:

1. that under the Convention on Biological Diversity;
2. that under the "Environmental Action Programme for East and Central Europe" as part of the "Environment for Europe" ministerial process; and
3. that under the European Union.

The Strategy seeks to ensure close harmonization between these processes.

7.10.6 Issues and Concerns

- The relationships between the principal players are complex. Jurisdictions and interests overlap, for example, the EEA has both an EU mandate and a pan-European role.

- Streamlining of reporting is a growing concern given the requirements not only of the EC, but of regional and global MEAs, and of statistical organisations.

- The EU is a party to (some) MEAs in a status similar to a "state" and hence has both reporting and implementation obligations in addition to member states..

- The identified directions for environmental policy in Europe require a wider perspective and hence a need to consider nature conservation in the context of other policies such as agriculture, fisheries, forests and water.

7.10.7 Current Harmonization Initiatives

European Union

The principal harmonizing policy instrument in the context of EC Policy Development is the 6th Environmental Action Plan. This plan incorporates Agenda 21 and connects this to both the

Convention on Biological Diversity and the UNECE with the activities of the Commission. The new programme stresses the need for Member States to better implement existing environmental laws

Strategically a certain degree of inter-sectoral harmonization is incorporated within the framework of the Sustainable Development Strategy of the European Union. It contains a number of concrete proposals for how the European Union can improve its policy-making to make it more coherent and focussed on the long term, as well as a number of specific headline objectives and the measures needed to achieve them.

Recently the European Commission has made a commitment, at the request of the Member States, not to develop new reporting requirements, but to work on consolidating those that currently exist.

It should be noted that besides international initiatives to harmonize reporting, a number of mechanisms are enshrined in Directives and Regulations promoting such efforts. Where no such obligations exist there is a reluctance among the Member States to carry out such harmonization.

Nevertheless the Commission has recently commissioned a report on complementarity between the National Biodiversity Strategies and Action Plans of the member states. This report could serve to help ensure harmonization between the actions taken by the European Union institutions and the Member States in the area of Biodiversity Conservation.

European Environment Agency

Additionally EUNIS is involved in the development of a number of harmonization tools;

- Synonyms Module – development of a system of correspondence between species and their synonyms for the internal management of the EUNIS database and for the wider use of EUNIS data. The EUNIS Species Database is now available online at the EEA web site and incorporates the synonyms module. This database includes relevant information on a selection of Plants and Invertebrates species (at least those listed under the EC Habitats and Birds Directives, and under the Bern Convention) and all European Vertebrates. The EUNIS Species Database will soon integrate the Flora Europaea Database, adding a further 42287 records.

- EUNIS Habitat Classification – development of a common reporting language on habitat types at European level: The EUNIS Habitat Classification builds upon previous initiatives (CORINE-Biotopes followed by the Palearctic Habitats Classification), but introduces agreed-upon criteria for the identification of each habitat unit and provides a correspondence with other classification-types (the two above mentioned, CORINE Land-Cover typology, Habitats Directive Annex I, Nordic classification system, and potentially other national systems). This database is now available online.

- Common Database on Designated Areas – a joint project between EEA, Council of Europe and UNEP-WCMC to co-ordinate and streamline information on designated areas resulting from various legal frameworks, whether at international, Community or national level. The sites are listed according to the official designations at national level. This list of designation types has about 600 individual designations registered according to national or sub-national law (of which about 350 for EEA member countries).

- The EUNIS 50x50 km UTM grid – development of a 50x50 km grid model following the adoption of common principles for a common European Chorological Reference Grid (CGRS) during a meeting between ETC/NPB and European atlases of species in 1998. These atlases include Atlas Flora Europaeae, Atlas of Amphibians and Reptiles in Europe, Atlas of European Breeding Birds, European Mammal Atlas and European Invertebrates Survey. The model will be one of the main EUNIS tools to refer any spatial data at European level.

The European Environment Agency is working to develop an inventory of the requirements for Member States to monitor and report environmental data. A reporting obligations database (ROD) has been developed and populated for the subject areas of air, water and waste. JNCC recently contracted UNEP-WCMC to undertake further work to identify the reporting obligations placed on countries of the European Union by international treaties and European Commission Directives related to biodiversity. JNCC will use the outputs of this work outputs to identify commonalities and overlaps in the reporting obligations, identify opportunities to make reporting to international instruments more efficient.

Geographically the scope is restricted to instruments that place obligations on the 15 member states of the European Union. It therefore includes global treaties and regional international instruments that affect one or more member states. A preliminary version of the Reporting Obligations Database is now available through the EEA Website.

Pan European

The Pan-European Biological and Landscape Diversity Strategy also seeks to harmonize biodiversity conservation by promoting a consistent approach and common objectives for national and regional action to implement the Convention on Biological Diversity.

The Strategy introduces a co-ordinating and unifying framework for strengthening and building on existing initiatives. It does not aim to introduce new legislation or programmes, but to fill gaps where initiatives are not implemented to their full potential or fail to achieve desired objectives. Furthermore, the Strategy seeks to more effectively integrate ecological considerations into all relevant socio-economic sectors, and will increase public participation in, and awareness and acceptance of, conservation interests.

The work plan of the PEBLDS comprises three elements:

Programme Element I. Enhancing the implementation of the Convention on Biological Diversity in Europe through the PEBLDS process
Programme Element II. Promoting and supporting specific European actions, initiatives and innovations
Programme Element III Building capacity of CEE/NIS countries in the conservation and sustainable use of biodiversity

Overall the implementation of the Strategy is carried out by the activities of the Strategy bodies; the Strategy Council and its Bureau (formally the Executive Bureau), through its national members and regional groupings, the joint Strategy Secretariat of Council of Europe and UNEP, through the Action Theme co-ordinators in implementing the Action Theme work programmes, and by the Innovative funding expert group under the Swiss Government and ECNC.

The Strategy's vision for the future is to achieve conservation and sustainable use of biological and landscape diversity for the whole continent of Europe and all its regions within 20 years

Other PEBLDS related harmonization activities underway in the region include UNEP's Biodiversity Service. This service was established by a consortium of four organisations; the United Nations Environment Programme (UNEP), IUCN - the World Conservation Union, the European Centre for Nature Conservation (ECNC) and the Regional Environmental Centre for Central and Eastern Europe (REC). The Biodiversity Service seeks to promote and facilitate the implementation of the Convention on Biological Diversity in CEE/NIS countries by providing assistance in implementing national biodiversity strategies and action plans.

European Monitoring and Indicator Framework

A further harmonization initiative developed as a result of the PEBLDS is the European Biodiversity Monitoring and Indicator Framework (EBMI-F). This initiative aims to enhance the possibilities for

creating more synergy among past, present and future biodiversity monitoring-to-reporting efforts at the European level in order to reach higher efficiency and effectiveness in communicating the state of, and trends in, Europe's biodiversity to the policy-makers concerned.

The Council of the PEBLDS has requested ECNC and EEA to develop and co-ordinate EBMI-F in order to support the implementation of PEBLDS. It will provide input into the next Ministerial Conference 'Environment for Europe' in Kiev, 2003. A proposal for EBMI-F has been developed jointly by ECNC and EEA.

CHM Implementation in Europe

At the first 'Biodiversity in Europe' conference in Riga a discussion paper on 'Future work on scientific and technical co-operation and the Clearing-House Mechanism' recommended further steps to reach more co-operation and synergy between the various CHM developments in Europe. This included developing a Pan-European CHM with involvement of PEBLDS members and EC CHM Steering Committee and by ensuring adequate financial and human resources. These recommendations were supported by an analysis report presented to the PEBLDS Council in May 2001. Co-ordination between the CBD-CHM, the Strategy Guide and the EC CHM and possibly also the ENBI and GBIF is currently under review by EEA, ECNC, UNEP and the Council of Europe.

At the Pan-European workshop 'Building the CHM Partnership', held in Bonn in September 2001 and attended by national CHM representatives from across Europe it was recommended to start a pan-European CHM co-ordination initiative in order to optimise scientific and technical co-operation, information exchange and networking. This should focus on concrete 'face-to-face' co-operation, a feasibility study and a pan-European Steering Committee.

7.10.8 Recommendations

Strategic:

European policy drivers are of high importance to the UK. As can be seen by the preceding analysis, nature conservation policy development and implementation in Europe is complex, and probably unnecessarily so. The following recommendations indicate the general strategic directions that should be sought to assist with rationalising nature conservation (and related) information systems in Europe. European issues cross-cut international issues and responsibilities and so note should be taken of the European consequences of more particular recommendations in other clusters.

Strategic recommendation 10.1: Support EC policy directions on the environment that seek to identify first the important policy decision needed, then the key information required to develop the policy and finally the information needed to assess the effectiveness of implementation measures.

Strategic recommendation 10.2: Support efforts that contribute to the reduction, streamlining and simplification of reporting within Europe and the integration of European reporting with reporting to MEAs.

Strategic recommendation 10.3: Support the development of harmonization tools that make nature conservation information comparable and useable, and streamlining tools that facilitate the process of information collection and use.

Practical:

***Recommendation 10.1:** Develop ways to improve connections between sustainable development and socio-economic aspects of "environment" with considerations of nature conservation. One implementation option is to constitute inter-departmental committees or similar bodies that consider the nature conservation consequences of policy (UK and EC) in agriculture, transport, forestry, fisheries, cultural heritage, development assistance and so on, and the information required to understand and inform on those impacts.*

***Recommendation 10.2:** Improve UK participation in EIONET to provide better access and exposure to UK National Reference Centres (noting that currently the information on the UK EIONET node website is out of date).*

***Recommendation 10.3:** Actively support the development of harmonization tools, particularly those associated with EEA and EUNIS. This means increased partnerships (UK NRCs) with the ETC/NPB particularly with respect to the harmonization initiatives of the EUNIS Habitat Classification (CEH is currently working on this), the Common Database on Designated Areas (UNEP-WCMC is working on this), and the synonyms module of the EUNIS Species Database. In this context, it would also be useful to promote compatibility of EU harmonization with global efforts (e.g. on species synonymy) in order to reduce duplication of effort.*

***Recommendation 10.4:** Support efforts by the EEA to reduce and streamline reporting, for example, by continuing to support the development, implementation and use of the Reporting Obligations Database (Nature Conservation component researched by JNCC and UNEP-WCMC), while noting previous recommendations made by JNCC and UNEP-WCMC on this project.*

***Recommendation 10.5:** Consider ways to reduce and streamline UK reporting (and other information-related obligations) to MEAs, the EC, the Council of Europe, OECD and other bodies. One step to achieving this may be to develop a tabulation of all nature conservation reporting obligations placed on the UK (based on the EU wide database already prepared by EEA) and use this to design national information systems to support these reporting requirements in a rational manner.*

***Recommendation 10.6:** Ensure there are close ties and appropriate integration between the UK Biodiversity Clearing-House Mechanism, the EC CHM, and the Strategy Guide.*

***Recommendation 10.7:** Make full use of national centres of expertise in contributing to European initiatives, for instance consider how the well-developed and respected monitoring protocols of the ECN could contribute to monitoring of SPAs and habitats under Natura 2000.*

***Recommendation 10.8:** Support the EEA Data Service and other EEA-led efforts to increase access to the datasets it compiles, and contribute UK data and expertise as appropriate.*

***Recommendation 10.9:** Avoid committing significant time to efforts that are not central to EU policy and those that are redundant or peripheral. To this end it might be useful to maintain a central inventory of nature conservation information initiatives both in the UK and in Europe – for instance an extension of the RINCIS database.*

Recommendation 10.10: Encourage and support periodic review of EEA data collection to ensure the relevance of data holdings to policy generation and review, including review of formats of information delivery.

7.11 CROSS-CUTTING RECOMMENDATIONS

7.11.1 Introduction

A number of practical recommendations arise that are not strictly limited to within-Cluster and reflect identifies strategic themes of integration and a "top down" approach, and the need across the board for harmonization tools and means to improved access to information. These recommendations are collected in this section.

7.11.2 Recommendations

Cross-cutting recommendation 1: Encourage convention secretariats, international NGOs, UN organisations, and intergovernmental organisations to develop tools for integrated access to case studies and good practices in nature conservation and means to make these more accessible and searchable through improved metadata.

Cross-cutting recommendation 2: Encourage convention secretariats to review the extent to which current information sources could be used to meet present needs, including assessing the effectiveness of the treaty, and at the same time articulate information needs and invite major data custodians to review how they can support these requirements.

Cross-cutting recommendation 3: Encourage the agencies that hold policy-relevant information resources to provide improved metadata to such facilities as the EEA's metadata services in order to make information sources better known and available.

Cross-cutting recommendation 4: Work with the EEA and other bodies concerned with environment metadata to incorporate improved quality management information into metadata profiles and the WebCDS metadata tool.

Cross-cutting recommendation 5: Encourage the improvement of standardised vocabularies for indexing and searching for information, for instance by supporting the addition of biodiversity-related terms to GEMET, and seeking further harmonization of GEMET with UNEP's EnVoc.

Cross-cutting recommendation 6: Encourage the EEA to undertake a thorough review of the EC-CHM both to assess functionality and content, and to ensure that it is meeting the needs identified by the Steering Committee and Task Force meetings and the feasibility study.

Cross-cutting recommendation 7: Promote improved linkages between biodiversity databases within the UK and international information services and networks, particularly those national databases sponsored by Government or managed by Government agencies to meet their own needs.

8 RECOMMENDATIONS FOR THE FUTURE OF THE REFERENCE GUIDE

8.1 INTRODUCTION

The current pilot system for the Reference Guide is implemented on the UNEP-WCMC website and has two components:

- a *Microsoft Access®* database that holds the structured profiles of the information sources; and
- an interactive, online query website driven by *Macromedia Coldfusion®* on a *Microsoft Internet Information Server* platform.

The information within the system consists of 187 standard format descriptions of information sources and services, the structure of which can be found in Annex II. Information has been compiled during the course of the project, but there are currently no resources or plans to maintain or expand this data after the completion of the project. A "live" online service that is continuously up-dated was a clear preference that came from the Workshop consultations. This section is intended to present some options for providing a viable on-going future for the Reference Guide.

Whilst the current system (software, server and available bandwidth) is suitable for a demonstration, it would require upgrading for delivery of a production level service, if extensive use was to be made. In this respect it should be noted that any part of the service can be independently upgraded to remove bottlenecks as they occur. For instance a more powerful database would speed up the query option if this were to become a limitation on use of the service.

8.2 ENHANCEMENTS AND IMPROVED FUNCTIONALITY

To date there has been relatively little feedback from users on the utility and functionality of the pilot Online Reference Guide. We believe, however, that some or all of the following enhancements would improve services to the user.

- Expanded search options - additional criteria and free text searching within the "Information Content" field
- Improved "Geographic scope" query, with the capability to conduct inclusive and exclusive searches
- Ability to export profiles in formats other than HTML, for example Word documents, PDF files etc.
- Ability to carry out a free-text search within an identified cluster of websites, as was shown in an earlier demonstration for the various European websites
- Improved searching through automated thesaurus support - that would prompt users with suggestions for alternative terms, and narrower and wider terms.
- Providing for user feedback and correction of profiles, for instance by an option for users to contribute information where their knowledge shows inconsistencies with profiles, and/or to give an opinion on the value of information sources or services
- Improving information content by increasing the scope of the coverage, e.g. to include more sustainable development and resource use areas
- Improving the information content by adding additional information fields on the existing sources and services

- Providing an online updating tool, which would allow anyone with approval to make changes to the underlying database (these could be moderated prior to display)

- Automating the synchronisation of database updates with the online Reference Guide

Deciding which of these enhancements are top priorities is best done after a period of user experience, to provide an understanding of how the service is used, for what purposes, and what difficulties were encountered and further needs identified.

The extent to which the system would need technical enhancements for performance depends almost entirely on the workload or traffic. The current demonstration system can easily handle light workloads, but access rates of greater than 10,000 per week, would require upgrading, potentially for both the database software and the bandwidth capacity of the communications facilities. Again this depends on monitoring and reviewing usage.

8.3 DATA MAINTENANCE CONSIDERATIONS

To ensure that the *Reference Guide* remains useful and current it will need to be reviewed and updated on a regular basis. Updates are required for one or more of the following reasons:

- change in the information source/service available
- change in the URL or other contact details
- addition of new information sources and services

This work could be carried out through research by an identified individual, and/or the users of the Reference Guide could be encouraged to submit further information. With this in mind, it should be noted that the Reference Guide software could be modified so that the updates could be made by someone (or several different people) not at UNEP-WCMC even if the database itself remained on the UNEP-WCMC Website.

8.4 BUILDING AND BROADENING THE USER BASE

If the Reference Guide is a useful service, then it is important to ensure that all those involved in nature conservation policy development and implementation at the national level are aware of what the service is, and what it can do for them. This implies a need for DEFRA to communicate information about the Reference Guide within the appropriate departments and agencies.

Although intended primarily to support UK policy-makers, the Reference Guide may also be of interest to a wider audience across Europe or even globally. This raises the issue of broadening the scope, in addition to wider advertising of the service. Already the CBD CHM has expressed interest in having the service available (linked) through their facilities.

8.5 ALTERNATIVE HOSTS AND MODALITIES OF MAINTENANCE

From a technical viewpoint, the system is modular with the database maintenance and web delivery currently separate. It is feasible that the maintenance of the database could be undertaken by one agency, and the web delivery by another.

Three potentially good options for hosting the site are: DEFRA, UNEP-WCMC, and JNCC (in conjunction with the UK Clearing-House Mechanism). Some advantages and disadvantages of each of the three options are outlined below:

Option	Advantages	Disadvantages
DEFRA	Close to/controlled by primary intended users	Lack of familiarity with the information sources for update
	No need to accommodate other needs and uses	Does not take advantage of value of wider international use
	Possibly lowest cost	Possible technology issues
JNCC/UK CHM	Used to providing for information needs of policy-makers	Not fully familiar with information sources and services
	Association with UK CHM could provide wide audience use in UK and Europe	May not take full advantage of value of wider international use
	Good potential to interest third parties	Associated costs of integration with, or conversion to, existing technology may be higher
UNEP-WCMC	Very familiar with and close to information sources and services	Not close to day-to-day needs of policy-makers
	Well positioned to up-date information	Costs of technology up-grade and human resources for data maintenance would need to be explicitly identified
	Experienced with providing similar services	
	Excellent potential to interest third parties in maintenance and development (possible cost offsets)	

Data maintenance can be considered in terms of three options as well. The following represent very preliminary rough estimates:

- *Basic maintenance:* One person for one day a week could quite effectively maintain the existing database information, without any significant improvement.

- *Steady improvement:* One person half time could maintain a data resource of this size and as well begin to augment both the quantity and quality of the data available. They would also be able to facilitate comments and additions by users.

- *Proactive expansion:* This would require one to two full-time positions and would permit broadening of the scope and content by adding improvements to the system (as described earlier), and actively seeking new sources to expand into a Europe-wide or global system with greatly improved coverage and linkages to the MEAs and CHMs. Technology enhancements would also be required.

As noted above, the choice of a host organisation depends on usage and intended purpose and audience, and this depends on assessment of use and potential use, and feedback from users. For example, it may be possible to develop a "consortium" approach to maintenance of the information and provision of the service.

We are happy to discuss with other possible hosts the transfer of the Reference Guide to their website if this were thought to be appropriate. Meanwhile it is important to appreciate that in the future there will be associated ongoing operational costs with delivering the database. Even the provision of the current service at UNEP-WCMC would require, after an agreed time, payment of costs in maintaining the database on our systems, web server provision and bandwidth costs. In addition, if the current system is extended to include a free text search of the online sources additional costs will be incurred.

8.6 RECOMMENDATIONS

It is clear that the level of use of the Reference Guide to date is too low to assess what its potential is, and it is therefore premature to define its future. The following recommendations are therefore concerned with both user review and feedback, and development of costed plans for the future implementation of the Reference Guide – if this is what the outcome of the review foresees.

Decision on the future of the Reference Guide should be postponed until a review has been carried out with potential users and options for collaboration with other organisations in delivering this service have subsequently been explored more thoroughly.

DEFRA should promote the use of the Reference Guide amongst those departments and agencies responsible for the development and implementation of nature conservation policy in the UK.

DEFRA should collaborate with a qualified external agency in carrying out a review of the Reference Guide with potential users, both within the UK and elsewhere, to identify to what extent the Reference Guide is a valuable service, and if it is how best to improve it.

DEFRA should commission a study to explore the possibility of a future collaborative approach to the delivery of the Reference Guide with other capable organisations, once the review with potential users has been carried out and there is a better understanding of the potential of the service, including developing a costed strategy and proposal for the future of the Reference Guide.

UNEP-WCMC, with the experience in conducting this project and involvement with other related initiatives, is well qualified to assist DEFRA in the above reviews and study, and would be interested in future participation in enhancing and expanding the scope of the Reference Guide.

Rationalization of International Nature Conservation Information Systems

Annexes to Final Report
August 2002

DEFRA Research Project CR0252

The ORBIS INSTITUTE

UNEP WCMC

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ANNEXES

List of Abbreviations and Acronyms

ABC	Australian Broadcasting Corporation
ARKive	Project short-name of the Wildscreen Trust
ASCIs	Areas of Special Conservation Interest
BBC	British Broadcasting Corporation
BCIS	Biodiversity Conservation Information System
BDM	Biodiversity Data Management (UNEP-GEF project)
BEG	Biodiversity Expert Group (of European Commission)
BGBM	Botanischer Garten und Museum Berlin-Dahlem
BGCI	Botanic Gardens Conservation International
BioNET	Biological network (part of CABI)
BIOSIS	Legal tradename of Biological Abstracts Inc
BRIM	Biosphere Reserves Integrated Monitoring
BRU	Biodiversity Reporting Unit
CABI	CAB International (former Commonwealth Agricultural Bureau)
CABRI	Common Access to Biological Resources and Information Service
CBD	Convention on Biological Diversity
CBD-CHM	CBD Clearing-House Mechanism
CDDA	Common Database on Designated Areas
CEE	Central and Eastern Europe
CEEC	Central and Eastern European Countries
CEH	Centre for Ecology and Hydrology (UK)
CELEX	Centre for Lexical information
CELIB	Computerised Environmental Law Information Base (UNEP)
CGRS	Chorological Grid Reference System
CHM	Clearing-House Mechanism
CIDA	Canadian International Development Agency
CIDS	Inter-American Committee on Sustainable Development
CIESIN	Consortium for the International Earth Science Information Network
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
COM	Prefix identifier for official meetings and documents of the European Commission
COP	Conference of Parties (COP7 would refer to the seventh COP)
CORINE	Coordination of Information on the Environment (EEA)
CSD	Commission for Sustainable Development (UN)
CURIA	Court of Justice and Court of First Instance (EU)
DAC	Development Assistance Committee (OECD)
DANIDA	Danish International Development Agency
DCMS	Department for Culture, Media and Sport (UK)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DEWA	Division of Early Warning and Assessment (UNEP)
DfID	Department for International Development (UK)
DG	Directorate General (of EC)
DISP	Donor Information Sharing Project
EAP	Environmental Action Plan
EBMI-F	European Biodiversity Monitoring and Indicator Framework
EC	European Commission or European Community
EC-CHM	EC Clearing-House Mechanism
ECN	Environmental Change Network (UK)
ECNC	European Centre for Nature Conservation
ECOLEX	Short name for Environmental Law information system of IUCN & UNEP.
EEA	European Environment Agency
EFNCP	European Forum for Nature Conservation and Pastoralism
EIONET	European Environment Information and Observation Network

ELC	Environmental Law Centre (of IUCN)
ELIS	Environmental Law Information System
EMAN	Ecological Monitoring and Assessment Network (Canada)
EMG	Environmental Management Group
ENBI	European Network for Biodiversity Information
ENHSIN	European Natural History Specimen Information Network
ENVOC	Environmental Vocabulary (UNEP)
ETC	European Topic Centre
ETC/CDS	European Topic Centre / Catalogue of Data Sources
ETC/NPB	European Topic Centre / Nature Protection and Biodiversity
EU	European Union
EUCC	European Union for Coastal Conservation
EUNIS	European Nature Information System
EUR-Lex	Short name for European law information system
EuroMAB	European Man and Biosphere programme
EUR-OP	Office for Official Publications (of the EC)
Europarc	Umbrella organisation of Europe's protected areas
Eurosite	Network of organisations managing Europe's natural heritage
Eurostat	Statistical Office of the European Communities
EWD	European Wildlife Division (of DEFRA)
FAO	Food and Agriculture Organization (UN)
FAOLEX	Short name for FAO law information system
FFI	Fauna and Flora International
FIELD	Foundation for International Environmental Law and Development
FishBase	Database of fish species information (The World Fish Centre)
FCO	Foreign and Commonwealth Office (UK)
G3OS	Referring collectively to the 3 Global Observing Systems (GCOS, GOOS, GTOS)
GBIF	Global Biodiversity Information Facility
GCOS	Global Climate Observing System
GEF	Global Environment Facility
GEMET	General Multilingual Environmental Thesaurus
GEMS	Global Environment Monitoring System (UNEP)
GEO	Global Environmental Outlook (GEO-3 referring to the third edition)
GIS	Geographic Information System (generic term)
GISP	Global Invasive Species Programme
GOOS	Global Ocean Observing System
GOSIC	Global Observing Systems Information Centre
GRID	Global Resource Information Database (UNEP)
GROMS	Global Register of Migratory Species
GTI	Global Taxonomy Initiative (of CBD)
GTOS	Global Terrestrial Observing System
GTZ	Gesellschaft fur Technische Zusammenarbeit (Germany)
GWD	Global Wildlife Division (of DEFRA)
HELCOM	Short name for Helsinki Convention
HTML	Hyper-Text Markup Language
IABIN	Inter-American Biodiversity Information Network
IAC	Informal Advisory Committee (to the CBD-CHM)
IACSD	Inter-Agency Committee on Sustainable Development
IBA	Important Bird Area (of Europe)
ICP	International Co-operative Programmes (of UN-ECE)
ICP/IM	International Co-operative Programme/ Integrated Monitoring (of UN-ECE)
ICSU	International Council for Science
IEEP	Institute for European Environmental Policy
IGO	Inter-Governmental Organization
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
ILTER	International Long-Term Ecological Research Network

IMG	Issues Management Group
INBio	Instituto Nacional de Biodiversidad (Costa Rica)
IPNI	International Plant Name Index
ISIS	International Species Information System
ISO	International Organization for Standardisation
ITIS	Integrated Taxonomic Information System
IUBS	International Union for Biological Sciences
IUCN	World Conservation Union
IUCN-ELC	IUCN Environmental Law Centre
IUCN-SIS	IUCN Species Information System
IUCN-SSC	IUCN Species Service Commission
IUCN-WCPA	IUCN World Commission on Protected Areas
JNCC	Joint Nature Conservation Committee (UK)
LTER	Long Term Ecological Research (USA)
MAB	Man and the Biosphere programme (of UNESCO)
MAP	Mediterranean Action Plan (of UNEP)
MCE	Main Component Elements (of EIONET)
MEA	Multilateral Environmental Agreement
MEP	Member of European Parliament
MNHN	Muséum National d'Histoire Naturelle (France)
NATLAN	NATure/LANd Cover Information Package (EEA)
NatureServe	Organisation name (Partner of the Nature Conservancy)
NERC	Natural Environment Research Council (UK)
NFP	National Focal Point
NGO	Non-Governmental Organization
NHM	Natural History Museum (UK)
NIS	Newly Independent States
NoLIMITS	Networking of Long-term Integrated Monitoring in Terrestrial Systems (EC project)
NRC	National Reference Centre (of EIONET)
NSF	National Science Foundation (USA)
ODBC	Open Data Base Connector
OECD	Organization for Economic Cooperation and Development
OECD/DAC	OECD Development Assistance Committee
OSPAR	Oslo and Paris (short name for Convention for the Protection of the Marine Fisheries of the North East Atlantic)
PEBLDS	Pan European Biological and Landscape Diversity Strategy
PEEN	Pan European Ecological Network
RBG	Royal Botanic Gardens
REC	Regional Environmental Centre (for Central and Eastern Europe)
REMIB	La Red Mundial de Informacion sobre Biodiversidad
RINCIS	Rationalisation of Nature Conservation Information Systems (this project)
ROD	Reporting Obligations Database (EEA)
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SBI	Sofia Biodiversity Initiative
SBSTTA	Subsidiary Body for Technical and Technological Advice (of the CBD)
SCOPE	Scientific Committee on Problems in the Environment (of ICSU)
SEDAC	Socio-Economic Data and Applications Center
SIDA	Swedish International Development Agency
SIS	Species Information System (IUCN)
SNH	Scottish Natural Heritage
SoE	State of the Environment
SPA	Special Protection Areas
SPAW	Specially Protected Areas and Wildlife (of the Wider Caribbean Region)
SPREP	South Pacific Regional Environment Programme (UNEP)
SQL	Structured Query Language
SSC	Species Survival Commission (IUCN)

STAP	Scientific and Technical Advisory Panel (to GEF)
TDWG	Taxonomic Databases Working Group
TEMS	Terrestrial Ecosystem Monitoring Sites (Database of GTOS)
TreeBASE	Database of phylogenetic knowledge held at Univ of Buffalo.
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP.Net	Short Name for UNEP information dissemination network
UNEP-DEWA	UNEP Division of Early Warning and Assessment
UNEP-GEMS	UNEP Global Environment Monitoring System
UNEP-GRID	UNEP Global Resource Information Database
UNEP-ROE	UNEP Regional Office for Europe
UNEP-WCMC	UNEP World Conservation Monitoring Centre
UNESCO	United Nations Education, Scientific and Cultural Organization
UNESCO-MAB	UNESCO Man and the Biosphere programme
UNESCO-WHC	UNESCO World Heritage Centre
UNU	United Nations University
US-AID	United States Agency for International Development
US-LTER	United States Long Term Ecological Research
UTM	Universal Transverse Mercator (map projection)
UVA	Universiteit van Amsterdam
WCPA	World Commission on Protected Areas (IUCN)
WDPA	World Database on Protected Areas
WebCDS	Catalogue of Data Sources on the Web
WHC	World Heritage Centre (UNESCO)
WHO	World Health Organization
WMO	World Meteorological Organization
WRI	World Resources Institute
WWF	World Wide Fund for Nature

Annex I
PERSONS AND ORGANISATIONS CONTACTED

Organisation	Unit	Name
Broads Authority		Michael Green
Countryside Agency		Richard Partington
Convention on Biological Diversity Secretariat	Clearing-House Mechanism	Marcos Silva
Birdlife International		Martin Sneary
Department for Environment, Food and Rural Affairs	EPINT (CBD National Focal Point and Darwin Initiative)	Marian Jenner Jonathan Tillson
	European Wildlife Division (EWD)	Linda Smith Oliver Neale Debbie Jackson Martin Capstick Sarah Jones Moira Anderson Sarah Webster John Angell Geoff Audcent Huw Thomas Andrew Stott
	Global Wildlife Division (GWD)	Richard Hepburn Robert Vagg John Hounslow Justin Evans Martin Brasher Stephen Lee-Bapty Robert Ford Vickie Whitehead Mark O'Sullivan Martyn Hedges Robert Ford
	CEFAS	Jim Ellis
	Fisheries Division IIB	Geoff Jasinski
	Sustainable Development Unit	Aphrodite Korou
Department for International Development	Environmental Policy Department	Simon Foster Sharon Laws Linda Brown
Department for Trade and Industry	Office of Science and Technology	Simon Rowley
English Nature		Keith Porter
Environment Agency	Environmental Strategy Directorate	Alistair Ferguson
Environment Canada	EMAN Coordinating Centre	Hague Vaughan Craig Stewart
European Environment Agency		David Stanners Ulla Pinborg
	ETC Nature Protection and Biodiversity	Dominique Richard
European Centre for Nature Conservation		Graham Drucker Ben Delbaere
Foreign and Commonwealth Office	Environment Protection Department	Sandy Moss
	Overseas Territories Department	Gillian Dare
Forestry Commission	Forest Research, Woodland Ecology Branch	Richard Ferris Mike Dudley Vicky West
German Federal Agency for Nature Conservation	Clearing-House Mechanism	Horst Freiberg
Global Biodiversity Information Facility		James Edwards
Global Register of Migratory Species		Klaus Riede
HM Customs and Excise		Guy Clarke Chris Miller

Organisation	Unit	Name
Joint Nature Conservation Committee		Paul Rose Tony Weighell Steve Gibson Lawrence Way James Williams Vin Fleming
National Biodiversity Network		James Munford
Natural Environment Research Council	Centre for Ecology and Hydrology (CEH)	Cynthia Davies Paul Harding Terry Parr
Organization for Economic Cooperation and Development	Environmental Information and Performance	Myriam Linster Christian Averous
Ramsar Convention Bureau		Nicholas Davidson
Royal Botanic Gardens, Kew		Kerry ten Kate Mark Jackson
Royal Society for the Protection of Birds		Alistair Gammell David W Gibbons
Scottish Environment Protection Agency		Scot Mathieson
Scottish Executive	Ecological Advisers Unit	Cameron Easton
Scottish Natural Heritage		Marion Hughes Edward MacKey
Traffic International		Teresa Mulliken
UK Overseas Territories Conservation Forum		Mike Pienkowksi
UN Food and Agriculture Organisation	Global Terrestrial Observing System	Jeff Tschirley
UNESCO	World Heritage Centre	Natarajan Ishwaren Mechtild Rossler Mario Hernandez
	Man and Biosphere Programme	Peter Bridgewater Salvatore Arico Thomas Schaaf
United Nations Environment Programme	Division of Environmental Conventions	Robert Hepworth
	Division of Early Warning and Assessment	Tim Foresman Mick Wilson
	GRID Geneva	Ron Witt
	GRID Arendal	Morten Sorensen

Annex II
TECHNICAL DETAILS OF THE RINCIS DATABASE AND THE REFERENCE GUIDE

PART 1 - RINCIS Database

General Content:

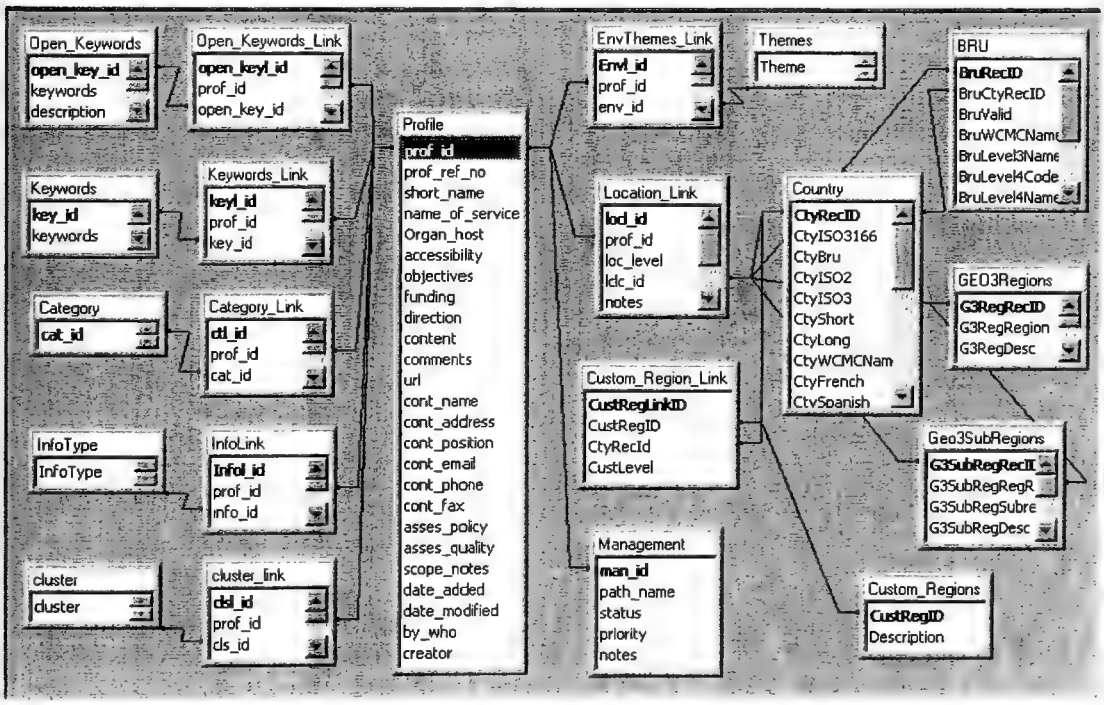
The database holds a collection of "Profiles" of international information sources and services related to nature conservation - with particular emphasis on sources and services relevant to UK policy making. Each profile consists of descriptive and keyworded information concerning the information service and its host organisation.

Database Technology:

The database has been developed using Microsoft Access® 97. Note that it may not operate correctly under Microsoft Access® 2000. It currently occupies approximately 2.7 KB

Structure:

The database consists of a primary table "Profile" that contains the main data items for each profile. Linked to this are a number of subsidiary tables that hold the keywords and controlled lists that serve to categorize the information and assist in retrieval. As these involve many-to-many relationships, additional intermediate link tables are required.



General entity-relationship diagram of the RINCIS Database

Database Tables and Fields:

Profile Table

Field Name	Description	Type	Comment
Prof_id	Profile unique identifier	Numeric	Assigned by Access
Prof_ref_no	Permanent reference number	Text	Assigned by UNEP-WCMC on data entry
Short-name	Short name or abbreviation of the service	Text	
Name_of_service	Full name of the source or service	Text	
Organ_host	Host organisation	Text	
Accessibility	Limitations or controls on access to the service – including whether charges are made	Descriptive	
Objectives	Purpose, intent, audience of the information service	Descriptive	
Funding	Funding and support sources and arrangements	Descriptive	
Direction	Future directions, plans for change, expansion, integration, harmonization	Descriptive	
Content	Description of the information content	Descriptive	
Comments	Any additional comments relevant to the service	Descriptive	
URL	The URL of the service	Text	If available
Cont_name	Name of person for contact information at the service provider	Text	
Cont_address	Mailing address for contact information at the service provider	Text	
Cont_position	Position or title of person for contact information at the service provider	Text	
Cont_email	Email address for contact information at the service provider	Text	
Cont_phone	Telephone number for contact information at the service provider	Text	
Cont_fax	Fax number for contact information at the service provider	Text	
Asses_policy	Assessment of relevance of the service to UK policy making	Descriptive	Subjective assessment by the research project team. Not available for access through the online reference Guide

Field Name	Description	Type	Comment
Asses-quality	Assessment of quality and quality control of the service	Descriptive	Not used. Comments on assessments and issues of quality can be found in the main body of the Final Report.
Scope_notes	Additional notes to clarify the geographic scope	Descriptive	Where needed to explain geographic scope
Date_added	Date of initial entry of profile	Date	Administrative information for audit trail
Date_modified	Date of modification of the entry	Date	Administrative information for audit trail
By_who	Person making the modification	Text	(Initials) Administrative information for audit trail
Creator	Person making the initial entry of the profile	Text	(Initials) Administrative information for audit trail

Other Linked Tables

Name of table	Content	Relationship to Profile	Associated Link Table
Category	General category of information service (Controlled list)	M:M	Category_link
Cluster	Cluster(s) or grouping of service related by biodiversity function (Controlled List)	M:M	Cluster_link
Themes	Environmental theme(s) (Controlled List)	M:M	EnvThemes_link
Keywords	Keywords describing the content of the information service (Controlled List - uses a sub-set of the GEMET keywords)	M:M	Keywords_link
Open_keywords	Open list of keywords	M:M	Open_keywords_link
Infotype	Types or categories of information products available (Controlled List)	M:M	Infolink
Management	Information relevant to managing the input and editing of the profiles	1:1	
BRU Country GEO3Subregions GEO3Regions	These tables implement the Geographic Scope of the service (of the information content, not access) See note below	M:M	GEO3Regionslink Location_link
Custom_Regions	Enables the definition of custom regions (list of countries) where a GEO3-Subregion is inadequate	M:M	Custom_Region_link

Note: The geographic scope is implemented through a hierarchical structure that employs the standard UNEP Regions, and Sub-regions, and the UN list of countries. It further extends to Biodiversity

Reporting Units (BRUs), which are sub-national units based on ecological zones. However, given the context of RINCIS, the geographic scope is not coded below the country level in this project.

Controlled Lists:

Category

The "Category" indicates the type of information service independent of content or scope.

Online information source
Database
Document repository
Network/exchange mechanism
Clearing-House
Metadata/catalogue
Information dissemination service
Taxonomic reference source
Referral service
Standards or other reference source

Environmental Theme

The "Environmental theme" indicates the nature of the associated environmental activities and sectoral purposes the service is intended to support.

Awareness raising
Biosafety
Climate Change
Conservation status
Convention harmonization
Environmental law
Genetically Modified Organisms
Indicators
Invasive species
Landscape & habitat conservation
Monitoring & Assessment
National reporting
Protected areas management
Regional/Global policy
Enforcement
Species Conservation
Standards and Classification Systems
Sustainable Use
Technology Transfer/Capacity building

Information Type

The "Information type" indicates the nature of the documents and information products available, independent of subject matter.

National reports
Treaty text
Formal decisions
Meeting minutes
Meeting papers
Reporting requirements and guidelines
Policy papers
National statistics
Regional statistics

Case studies
Good practices
Standards
Species status
Species checklists
Indicators
Global assessments
Lists of parties
Roster of experts
Focal points
Site descriptions and reports
Monographs
Databases
Metadata
News/Events
Taxonomy

Cluster

The "Cluster" indicates a grouping of information sources into those of similar nature and user audience. The analysis of the information sources in the RINCIS Final Report was conducted on a cluster basis, although some minor clusters were omitted. Explanation of the cluster contents can be found in Section 3.2.2 of the Final Report.

Conventions
Protected areas and sites
Development projects and donor information
CHMs and information sharing
Environmental law
Global and regional monitoring
Policy
Species status
Taxonomy
European
Metadata and catalogues
Portals and virtual libraries
Miscellaneous

Keywords

The "Keywords" classify the service with respect to the subject content of the information. The controlled keyword list is a selected sub-set of the General Multilingual Environmental Thesaurus (GEMET).The numeric code that precedes each term is the GEMET reference number – that links to the multilingual terms.

S:0047 climate change
S:0255 ecologically sensitive area
S:0288 landscape
S:0296 natural area
S:0297 coastal area
S:0311 forest
S:0359 wetland
S:0370 protected area
S:0373 biosphere reserve
S:0377 marine conservation area
S:0379 national park
S:0384 reserve
S:0406 wildlife sanctuary
S:0408 world heritage site
S:0506 plant biology

S:0518 ecology
S:0533 distribution area
S:0540 ecological parameter
S:0549 biodiversity
S:0566 genetic diversity
S:0571 species
S:0573 animal species
S:0574 bird species
S:0575 migratory species
S:0576 endemic species
S:0577 exotic species
S:0578 plant species
S:0580 ecosystem type
S:0581 aquatic ecosystem
S:0582 coastal ecosystem
S:0583 estuarine ecosystem
S:0584 freshwater ecosystem
S:0585 marine ecosystem
S:0588 terrestrial ecosystem
S:0607 wetlands ecosystem
S:0623 ecosystem
S:0631 habitat
S:0633 wildlife habitat
S:0635 animal population
S:0636 plant population
S:0637 population dynamics
S:0646 marine mammal
S:0658 migratory bird
S:0661 waterfowl
S:0662 fish
S:0664 mammal
S:0767 micro-organism
S:0838 wildlife
S:1605 natural resource
S:1931 agriculture
S:2012 forestry
S:2046 fishery
S:2925 pollution
S:3091 environmental changes
S:3399 environmental legislation
S:3406 nature conservation legislation
S:3458 international law
S:3630 integrated management
S:3636 policy instrument
S:3730 policy
S:3920 nature conservation policy
S:3923 sustainable development
S:4054 intervention in nature and landscape
S:4089 endangered species (IUCN)
S:4094 protected species
S:4102 conservation of species
S:4107 nature conservation
S:4117 wildlife conservation
S:4119 natural areas protection
S:4147 environmental assessment

Forms:

A main data entry form ("Profile-entry") provides for entry of all of the information for a profile including the geographic scope. Sub-forms are brought up automatically as needed for adding new

"open keywords", data management information, and defining new "custom regions". Although a large number of other forms and sub-forms have been defined and appear under the Access "Forms" tab, all can be effectively activated through the single form "profile-entry".

PART 2 – On Line Reference Guide

Technology:

The Online Reference Guide uses ColdFusion® software to interface to the Access® database using an Open Database Connector (ODBC). The search query as entered in a user form online through standard browsers, is interpreted and converted to an Access® query.

The results of the search are compiled using standard SQL queries with the parameters derived from the user selection on the query page. This is then converted on the server into standard HTML which is returned to the users browser window.

The ColdFusion® version used is currently 5 but the application should port to the latest version (Coldfusion MX) without any difficulties. Access 97 is used as the underpinning database structure, but could easily be upgraded to later versions or SQL Server.

The Reference Guide is designed to work best with Internet Explorer, but can also be used effectively with Netscape and some other browsers, although the layout and spacing of the results may not be ideal.

The online service interfaces with a **copy** of the RINCIS database, and is not automatically kept current with any changes to the master database.

Querying to Find Information Sources and Services:

The query system for the online Reference Guide provides for a number of different means to select profiles from the RINCIS Database. The three primary avenues are:

- Query by **name**
- Query by **descriptive term**
- Query by **geographic scope**

Query by name:

The upper part of the query form provides for finding profiles by all or part of the name of the service as listed in the database. There are four options:

"is" – when you know the exact complete name
"begins with" – when you know the first word of the name
"ends with" – to search for the last part of the name
"contains" – when you know part of the name

Select the mode of search you want, type in the name or part thereof and click *"search"*. Note that:

- The search is NOT case-sensitive.
- The *"contains"* option is the most frequently used, as it is hard to anticipate the exact name of the service.
- Leaving the search field blank will select a complete list of **all** profiles in the database

Query by descriptive term:

All of the profiles have been indexed to assist retrieval by 6 different sets of descriptive terms. These are:

Category of service - indicates the type of information service independent of content or scope.

Environmental theme - indicates the nature of the associated environmental activities and sectoral purposes the service is intended to support.

Information types available - indicates the nature of the documents and information products available, independent of subject matter.

Cluster - indicates a grouping of information sources into those of similar nature and user audience.

Keyword - these classify the service with respect to the subject content of the information, using a selected sub-set of the General Multilingual Environmental Thesaurus (GEMET).

Open Keyword – similar to the above, except not limited to the specific sub-set of GEMET. These terms have been used mainly to be more specific regarding species groups.

Search terms may be chosen from the pull down lists in each query box, by clicking on the term.

Thus choosing the term "Treaty text" from the Information Type box will select all information sources where the exact text of the treaty or treaties is available from the source.

Multiple choices can be made by holding down the "Ctrl" key. Such multiple choices are logically connected by an **or** operator. Thus choosing both "Treaty Text" and "Case studies" in the Information Type box will select all profiles that have either (or both).

The different descriptive terms are connected by a logical **and** operator, i.e. both must be true to select a profile. Thus selecting "case studies" in the Information Type and "species conservation" in the Environmental Theme box will select all information sources that contain case studies and are related to species conservation.

NOTE:
The query box for the Name of Service must be cleared before querying by any of the descriptive terms.

Query by geographic scope:

The "geographic scope" refers to the scope of the information holdings of the information source (not the location of the organisation), and does not necessarily coincide with the scope of the related instrument.

The geographic scope has been coded in a hierarchical scheme by Region, Sub-region and country, as well as the designation "global". The Regions and Sub-regions are those used by UNEP. The scope may be defined by combinations of one or more of the above (except where global). Thus the scope might be Europe (Region) plus the countries Sweden, Norway and Denmark.

The search at present does not automate the hierarchy – that is you must specifically indicate the country, sub-region and region of interest, and cannot assume that selecting "France" will also select Western Europe (Sub-region) and Europe (Region). The user is advised to use the "**or**" capability explicitly to ensure that the correct criteria are applied.

NOTE: The geographic search function is complex and may operate quite slowly on the current test-bed server.

NOTE: If used in conjunction with descriptive terms, the geographic scope query operates as an "and", thus further refining the search.

Viewing or Printing Results:

Once the list of selected profiles is displayed, any profile can be viewed by clicking on its reference number.

To view (or print or download) a number of profiles simply click on the "select" box at the right hand side of those desired, and then click "show selected profiles" at the bottom of the list. This prepares a file suitable for printing or downloading.

In this way a customized desk reference guide can be produced.

To print the selected profiles click on *file/print*.

Downloading Results :

To download a file of the profiles click on *file/save as* and choose *save as type: "Web-page, html only"*. The resulting .html file can then be opened and printed using browsers, MS-Word®, or the like, and converted to other formats, including a Word document. Some manual editing of page breaks in Word is recommended to obtain a well formatted document.

This method can be used to obtain a complete copy of the Reference Guide if desired.

Annex III
SUMMARY LIST OF SOURCES AND SERVICES

Name of Service	Ref No	Short Name
African Development Bank Web-site	001	African Development Bank
African-Eurasian Migratory Waterbird Agreement Web-site	002	AEWA
Agreement on the Conservation of Bats in Europe Web-Site	006	Eurobats
Agreement on the Conservation of Cetaceans of the Black Sea,	004	ACCOBAMS
Agreement on the Conservation of Small Cetaceans of the Baltic and North	007	ASCOBANS
ALL Species Inventory	297	ALL Species
Asia Pacific Centre for Environmental Law	010	APCEL
Asia-Pacific Co-operation for the Sustainable Use of Renewable Natural	011	ASPACO
Asian Development Bank Web-site	012	ADB
ASIL Guide to Electronic Resources for International Law	013	ASIL
Atlas Florae Europea	170	Atlas Florae Europea
Bath Information and Data Services	021	BIDS
Bellanet	289	Bellanet
Biodiversity Conservation Information System	022	BCIS
Biodiversity Monitoring Database	023	BioMon
Biodiversity Observations on the Internet	261	BIO
BioNET-International: The Global network for Taxonomy	024	BioNET International
Biosafety Clearing-House	249	Biosafety CH
BIOSIS UK	026	BIOSIS
Biosphere Reserve Integrated Monitoring Programme	027	BRIM
BirdLife International - Important Bird Areas Database	227	IBA Database
Botanic Gardens Conservation International Web-site	028	BGCI
CABI Bioscience Resource Centre	030	CABI Bioscience
CABI Publishing	032	CABI Publishing
Catalogue of Data Sources	309	WebCDS
Center for Conservation Biology Network	264	CCBN
Centre for Ecology and Hydrology	035	CEH
Centre for International Environmental Law	229	CIEL
Centre for Specially Protected Areas	038	RAC/SPA
CITES Listed Species Database	290	CITES Database
Commission for the Conservation of Antarctic Marine Living Resources	297	CCAMLR

Name of Service	Ref No	Short Name
Common Database on Nationally Designated Areas	308	CDNDA
Computerized Environmental Law Information Base	040	CELIB
Conservation International Web-site	242	CI
Consortium for International Earth Science Information Network	044	CIESIN
Consortium of European Taxonomic Facilities	244	CETAF
Consultative Group on International Agricultural Research Web-site	045	CGIAR
Convention for the Protection of the Marine Environment of the Northeast	241	OSPAR Convention
Convention on Biological Diversity - Clearing-House Mechanism	049	CBD CHM
Convention on Biological Diversity Secretariat Web-site	048	CBD
Convention on International Trade in Endangered Species of Wild Fauna	050	CITES
Convention on the Conservation of European Wildlife and Natural Habitats	020	Bern Convention
Convention on the Conservation of Migratory Species of Wild Animals	053	Bonn Convention (CMS)
Coral Reef Alliance	178	CORAL
Council of Europe Website on Environment	054	CoE Environment
Database of World Diptera	216	Diptera Database
DIVERSITAS	057	DIVERSITAS
EarthTrends - The Environmental Information Portal	060	EarthTrends
EC Fisheries Data Exchange System	089	FIDES
EC Wildlife Trade Regulation Database	078	EC Wildlife Trade
ECOLEX	061	ECOLEX
EEA Data Service	305	EEA Data Service
Electronic Development and Environment Information System	265	ELDIS
Environmental Treaties and Resource Indicators	067	ENTRI
EUCC Coastal Guide	039	Coastal Guide
EUR-Lex Portal	292	EUR-Lex
Euro + Med PlantBase	077	PlantBase
EUROPA - The European Union Online	069	EUROPA
European Centre for Nature Conservation Web-site	226	ECNC
European Commission Development Directorate General Web-site	071	EC DG-Development
European Commission Environment Directorate General Web-site	072	EC DG-Environment
European Community Biodiversity Clearing-House Mechanism	074	EC-CHM
European Environment Agency main web-site	075	EEA
European Environment Information and Observation Network	079	EIONET
European Man and Biosphere Programme Web-site	076	EuroMAB

Name of Service	Ref No	Short Name
European Natural History Specimen Information Network	267	ENHSIN
European Nature Information System	084	EUNIS
European Network for Biodiversity Information	302	ENBI
European Register of Marine Species	081	ERMS
European Topic Centre on Nature Protection and Biodiversity Web-site	082	ETC/NPB
Expert Center for Taxonomic Identification	085	ETI
FAO - Biodiversity Web-site	086	FAO - Biodiversity
FAOLEX	293	FAOLEX
Fauna and Flora International Web-site	239	FFI
Fauna Europaea	088	Fauna Europaea
Fisheries Global Information System	087	FIGIS
Foundation for International Environmental Law and Development Web-site	232	FIELD
Global Biodiversity Information Facility	092	GBIF
Global Change Master Directory	307	GCMD
Global Coral Disease Database	094	Global Coral Disease
Global Coral Reef Monitoring Network	095	GCRMN
Global Environment Facility - Projects	096	GEF-Projects
Global Environment Outlook Data Portal		GEO Data Portal
Global Environmental Information Locator Services	269	GELOS
Global Forest Information Service	097	GFIS
Global Invasive Species Programme	098	GISP
Global Land Information Service	306	GLIS
Global Register of Migratory Species	101	GROMS
Global Terrestrial Observing System	102	GTOS
GRID-Arendal - Arctic Portal	295	Arctic Portal
GRID-Arendal - Nordic/Baltic Resources	296	Nordic/Baltic
GRID-Arendal - The SoE Gateway	298	SoE Gateway
GRID-Arendal Biodiversity in Central and Eastern Europe	297	BCEE
GRID-Arendal Web-site	174	GRID-A
GTOS - Terrestrial Ecosystem Monitoring Sites Database	252	GTOS-TEMS
ICLARM FishBase	113	FishBase
Infoterra: The Global Environmental Information Exchange Network	105	INFOTERRA
Integrated Taxonomic Information System	106	ITIS
Inter-American Biodiversity Information Network	107	IABIN

Name of Service	Ref No	Short Name
Inter-American Development Bank Web-site	108	IDB
Intergovernmental Oceanographic Commission - The Ocean Portal	110	Ocean Portal
International Center for Agricultural Research in the Dry Areas Web-site	112	ICARDA
International Coral Reef Initiative - Electronic Partnership Forum	118	ICRI
International Institute for Environment and Development Resource Centre	122	IIED
International Institute for Sustainable Development - "Linkages"	123	Linkages
International Legume Database & Information Service	124	ILDIS
International Livestock Research Institute Web-site	125	ILRI
International Long Term Ecological Research Network	126	ILTER
International Oceanographic Data and Information Exchange Programme	247	IODE
International Organisation for Plant Information Global Plant Checklist	127	IOPI Checklist
International Petroleum Industry Environmental Conservation Association	129	IPIECA
International Plant Genetic Resources Institute Web-site	114	IPGRI
International Plant Names Index	130	IPNI
International Science Centres for Expertise and Excellence in Pollination	313	ISCEEP
International Species Information System	133	ISIS
International Tropical Timber Organization Web-site	135	ITTO
International Whaling Commission Web-site	138	IWC
Internet Guide to International Fisheries Law	055	International Fisheries law
IUCN - Environmental Law Information Service	140	ELIS
IUCN Red List	300	IUCN Red List
IUCN The World Conservation Union Web-site	141	IUCN
Joint Web-site of the Biodiversity Related Conventions	251	Joint Biodiversity
MAP Coordinating Unit	195	UNEP/MEDU
Marine Life Information Network for Britain and Ireland	144	MarLIN
Marine Mammal Action Plan	145	MMAP
Millennium Ecosystem Assessment	299	Millennium Assessment
Missouri Botanical Garden (TROPICOS)	148	TROPICOS
National Biodiversity Network	278	NBN
National Biological Information Infrastructure - International Resources	279	NBII
National Criminal Intelligence System	150	NCIS
Natura 2000 Network	073	Natura 2000
Nature/Land Cover information package	151	NATLAN
NatureServe	294	NatureServe

Name of Service	Ref No	Short Name
NatureServe Explorer	254	NatureServe Explorer
OECD - Development Assistance Committee	250	OECD-DAC
OECD Environmental Statistics	291	OECD - Stats
OECD Online Bookshop	157	OECD Online Bookstore
Pan-European Ecological and Landscape Diversity Strategy Guide	160	PEBLDS Guide
Protocol Concerning Specially Protected Areas and Biological Diversity in	017	Barcelona Convention
Ramsar Convention on Wetlands Web-site	164	Ramsar Convention
Ramsar Database	237	Ramsar Database
REFORGEN: The FAO world-wide information system on forest genetic	166	REFORGEN
Regional Environmental Centre for Central and Eastern Europe	236	REC Central & Eastern
Royal Botanic Gardens Kew Herbarium - Global plant database	168	RBG-Kew
Socio-economic Data and Applications Center Web-site	311	SEDAC
Species 2000	240	Species 2000
Species Information System	310	SIS
Sustainable Alternatives Network	281	SANet
System-wide Information Network for Genetic Resources	282	SINGER
Taxonomic and Biogeographic Information System for Scleractinian Corals	015	Coral ID
Taxonomic Database Working Group	177	TDWG
The Species Analyst	284	TSA
The World Zoo Organization Web-site	224	World Zoo
Traffic International Web-site	285	Traffic
Tree of Life	185	Tree of Life
TreeBase	183	TreeBase
UK Overseas Territories Conservation Forum: Information Database	186	UKOTCF
UNEP Caribbean Environment Programme Web-site	190	UNEP-CEP
UNEP Regional Office for Europe Web-site	196	UNEP/ROE
UNEP World Conservation Monitoring Centre Web-site	194	UNEP-WCMC
UNEP-WCMC Arctic Bird Library	009	Arctic Bird Library
UNEP-WCMC Harmonization of National Reporting Web-site	304	Harmonization of National
UNEP-WCMC Marine Turtle Nesting Database	146	Marine Turtle Database
UNEP-WCMC Species Database	181	Species Database
UNEP-WCMC Threatened Plants Database	182	Threatened Plants Database
UNEP-WCMC Tree Conservation Database	184	Tree Conservation
UNEP-WCMC/IPIECA Environmental Information Service	065	WCMC/IPIECA

Name of Service	Ref No	Short Name
UNEP.Net - Environment Network	193	UNEP.Net
UNESCO Biosphere Reserves Directory	260	Biosphere Reserves
UNESCO International Hydrological Programme	202	UNESCO-IHP
UNESCO World Heritage Center	206	UNESCO-WHC
United Nations Commission on Sustainable Development Web-site	207	UN-CSD
United Nations Convention to Combat Desertification Web-site	209	UNCCD
United Nations Development Programme Web-site	312	UNDP
United Nations Economic Commission for Europe Web-site	188	UN-ECE
United Nations Environment Programme Web-site	189	UNEP
United Nations Framework Convention on Climate Change Web-site	212	UNFCCC
United Nations List of Protected Areas	213	UN List
World Bank - Data & Statistics/Data Publications	257	WB - Statistics
World Bank - Projects and Operations Database	258	WB - Projects
World Bank Environment Division Web-site	218	WB - Environment
World Bird Database	303	WBDB
World Commission on Protected Areas Web-site	219	WCPA
World Database of Protected Areas	220	WDPA
World Heritage Information Network	221	WHIN
World Resources Institute Web-site	222	WRI
WWF Global Network	238	WWF

Annex IV
UK REPRESENTATION ON INTERNATIONAL BODIES RELEVANT TO NATURE CONSERVATION

Note: This table is based on extensive consultation with UK government departments and agencies, MEA secretariats, international and national NGOs, and so on, as well as references to websites. It is however not necessarily complete as the information proved to be difficult to assemble. We believe that this would be a useful reference for DEFRA to complete, verify, maintain and make available widely to those active in nature conservation policy-making.

Agency or Instrument	Body or means	UK Responsible Department/office	Usual or recent Representative	Comments
UNEP	Governing Council	FCO & DEFRA		
	Committee of Permanent representatives	FCO		
UN agencies	Joint Group of Experts on the Scientific Aspects of marine Environmental protection (GESAMP)		John Hambury	[Nautilus Consultants Ltd.]
UNESCO	General Conference	DfID, DCMS, DES		
	MAB Council/Bureau	DEFRA (EWD)	Hilary Neal	
	MAB Biosphere Reserves Advisory Committee		Martin Price	
	MAB National Committee	DEFRA (EWD)	Hilary Neal	Full list at http://www.nmw.ac.uk/mab/members.htm
GEF	Council	DfID & DEFRA	Adrian Davis, Glenys Parry	
	Scientific and Technical Advisory Panel (STAP)			32 UK experts listed on the STAP Roster of Experts, of whom 13 are biodiversity. Most are academics, some NGO and consultants
UNECE	Aarhus Convention	DEFRA (SDU)	Alan Crockford	
	Committee on Environmental Policy			

Agency or Instrument	Body or means	UK Responsible Department/office	Usual or recent Representative	Comments
CBD	Focal Point	DEFRA (EPINT)	Glenys Parry	Also significant input from Kerry ten Kate (RBG Kew), Chris Lyall (NHM) and many others
	CHM Focal Point	JNCC	Malcolm Vincent	
	Biosafety Focal Point	DEFRA	David Steele	
	Global Taxonomy Initiative	Natural History Museum	Alistair Taylor	
	CHM Informal Advisory Committee	UNEP-WCMC	Jeremy Harrison	UK is not a member, but UK-Based UNEP-WCMC is.
WHC	Committee	DCMS	Clare Pilman	Technical support from Tony Weighell (JNCC) and Chris Young (English Heritage)
Bern Convention	Standing Committee	DEFRA (EWD)	Hilary Neal	
Council of Europe	Committee for the activities of the CoE in the field of biological and landscape diversity			
	Group of Specialists on the European Diploma for Protected Areas		Ian Mercer	
	Group of Experts on Plant Conservation	JNCC	Nick Hodgetts	Also Jane Smart (PlantLife) and others
PEBLDS	Strategy Council	DEFRA (EWD)	Hilary Neal	Also John Angell (DEFRA) and Richard Leafe (English Nature)
	Committee of Experts for the Establishment of the Pan-European Ecological Network	CCW	Peter Stuttard	
Bonn Convention	Focal Point	DEFRA (GWD)	Stephen Lee-Bapty	
	Standing Committee			UK not currently on standing committee

Agency or Instrument	Body or means	UK Responsible Department/office	Usual or recent Representative	Comments
	Scientific Council	SNH	Colin Galbraith - chairman of most recent meeting	Also Dr Mike Moser is Scientific Councillor (Birds) appointed by the COP Most recent meeting had Sandy Moss (FCO) and Mark O'Sullivan (DEFRA) as observers
ASCOBANS	Co-ordinating Authority	DEFRA (EWD)	Christine Tucker	
	Advisory Committee	JNCC	Mark Tasker	Currently chairman
Eurobats	Competent authority	DEFRA	John Clorley	
	Advisory Committee	English Nature	Anthony Mitchell-Jones	
AEWA	Administrative Authority	DEFRA (EWD)	Christine Tucker	
	Designated Contact Officer	JNCC	David Stroud	
ACCOBAMS		DEFRA (GWD)	Stephen Lee-Bapty	The UK is not currently party to ACCOBAMS
		JNCC	Mark Tasker	
Ramsar Convention	National Implementing Agency	DEFRA (EWD)	Huw Thomas	
	Scientific and Technical review Panel	JNCC	Marcus Yeo	
CITES	Management Authority	DEFRA (GWD)	Martin Brasher	Note also interest of HMC
	Animals Committee	JNCC	Vin Fleming	
	Plants Committee	RBG Kew	Noel McGeogh	
	Consortium	CEH	Dorian Moss	
OSPAR	National Contact Point	DEFRA	John Roberts	
EC	Parliament	MEPs		
	Economic and Social Council	MEPs		

Agency or Instrument	Body or means	UK Responsible Department/office	Usual or recent Representative	Comments
	Biodiversity Working Group			
	Habitats Committee	DEFRA (EWD)	Trevor Salmon	
		JNCC	Marcus Yeo	
	Ornis Committee	DEFRA (EWD)	Christine Tucker	
	EC CHM Steering Committee	JNCC	Lawrence Way	
EEA	Management Board	DEFRA (EPSIM)	John Custance, Dinah Nichols	Other key contacts listed at http://nfp-gb.eionet.eu.int/suitespot/ns-home/docs/eionet/node/nfp/uk/index.old/suitespot/ns-home/docs/eionet/node/nfp/uk/uknfp-info.htm
	National Focal Point	DEFRA (EPSIM)	Stan Speller	
	Scientific Committee		David Briggs (Imperial College)	
EIONET	National Focal Point	DEFRA (EPSIM)	Paul Swallow	
EEA-ETC/NCB	Advisory Group	JNCC		
GBIF	Governing Board	DEFRA	Marian Jenner	
		JNCC	Paul Rose	
OECD	Environmental Statistics	DEFRA (EPSIM)	Andrew Burchell	
IUCN	State member	DEFRA	Martin Brasher	
	Council		Alistair Gemmell	
	UK Committee Chair		Jane Smart	
	Species Survival Commission		Georgina Mace	SSC has many members in the UK (including several speciallist group chairs). Georgina Mace is on the Executive Committee
	World Commission on Protected Areas		Adrian Phillips, Roger Crofts	WCPA has many members in the UK, but these two are currently both Vice Chairs and on the Steering Committee

Key national institutions with international significance
Royal Botanic Gardens - Kew
Royal Botanic Garden - Edinburgh
Natural History Museum
RSPB

Key international bodies located in UK
UNEP-WCMC
BirdLife International
IIED
BGCI
FFI
CABI

Annex V
EXTRACTED RECOMMENDATIONS

1 STRATEGIC RECOMMENDATIONS

Strategic recommendation 1: Identify national strategic directions and goals for nature conservation and as a consequence define the needs and priorities for information.

Strategic recommendation 2: Review and discuss these needs widely within those agencies responsible for policy development and implementation, in order to ensure an integrated and co-ordinated approach to use of international information sources and services.

Strategic recommendation 3: Support the development of information networks and reporting mechanisms that allow for the assessment of the effects of instruments such as MEAs and of national and international actions towards the desired goals.

Strategic recommendation 4: Develop mechanisms for closer liaison between the various departments and sectors within the UK government structure in order to improve the capacity to assess the overall impact of policies on nature conservation and improve overall cross-cutting communication.

Strategic recommendation 5: Ensure effective use of international information sources and services in development and implementation of nature conservation policy in the UK through the wide availability of metadata tools such as the RINCIS online Reference Guide, and improved knowledge of other information networks such as EIONET and Clearing-House Mechanisms.

Strategic recommendation 6: In supporting projects and programmes in information access and policy development, focus on the major players most relevant to the UK and UK policy, such as the EEA (and ETCs), UNEP, OECD, and those directly concerned with national implementation of international agreements.

Strategic recommendation 7: Support international initiatives that are leading to harmonization of information sources and services, including through the implementation of pilot and demonstration projects within the UK.

Strategic recommendation 8: Take steps to support improvements in existing information sources and services where they are not currently adequate to UK needs and purposes.

Strategic recommendation 9: Promote development of further international information sources and services, where there are significant gaps, especially those that can provide credible information on global and regional trends, and that can serve multiple policy purposes.

Strategic recommendation 10: Support measures and information services that assist:
- ***Implementing European policies, Directives and other obligations***
- ***Accessing case studies and best practices***
- ***Reducing/streamlining reporting processes***
- ***Improving access to experts***
- ***Improving early warning of emerging issues.***

2 CLUSTER RECOMMENDATIONS

2.1 RECOMMENDATIONS ARISING FROM CLUSTER 1 - CONVENTION AND TREATY INFORMATION SERVICES

Strategic:

Strategic recommendation 1.1: Promote and support efforts to harmonize and streamline reporting procedures and requirements of MEAs.

Strategic recommendation 1.2: Promote and support efforts to rationalise the scope and intent of MEAs and to develop mechanisms for improved collaboration in implementation.

Strategic recommendation 1.3: Encourage MEAs to focus on collecting only the information relevant to assessing and increasing the effectiveness of the treaty, or supporting implementation by other parties.

Strategic recommendation 1.4: Consider means of adapting national environmental reporting systems to gather and consolidate information for multiple national and international use more efficiently.

Strategic recommendation 1.5: Promote the development of integrated information tools and approaches to facilitate MEA implementation.

Practical:

Recommendation 1.1: Through the Governing Council of UNEP and governing bodies of MEAs, support decisions that recommend treaty harmonization and co-operation, and support accompanying resource allocations.

Recommendation 1.2: Support current and future UNEP pilot projects in harmonization of reporting by, for example, supporting a national pilot project within the UK, or sponsoring one or more pilot projects in a developing country of importance to the UK.

Recommendation 1.3: Encourage UNEP to move forward from the current pilot projects to related implementation and capacity building, also taking further account of the recommendations of international workshops on this issue.

Recommendation 1.4: Participate in or otherwise support CBD information-related activities such as the meetings on "Formats, Protocols and Standards for the improved exchange of biodiversity information".

Recommendation 1.5: Encourage MEA secretariats to work jointly on the development of harmonization tools for nature conservation information - and to ensure that these efforts are linked to European initiatives such as Natura 2000, and international approaches such as GTOS and ILTER. Some particular areas in need of harmonization tools are habitat and ecosystem classification, protected area designation, conservation and biodiversity status.

Recommendation 1.6: Encourage MEA secretariats to make all documents (current and past) available online, including national reports, and encourage UNEP to work with the secretariats to facilitate integrated access to these documents and reports.

Recommendation 1.7: Encourage MEA secretariats and other appropriate organisations to make case study information more readily available, to build "lesson-learned" libraries and to develop tools to facilitate access to them.

Recommendation 1.8: Promote greater integration of the CBD Clearing-House Mechanism "network", and push for increased emphasis on promoting technical and scientific collaboration.

2.2 RECOMMENDATIONS ARISING FROM CLUSTER 2 – INFORMATION ON SITES

Strategic:

Strategic recommendation 2.1: Support initiatives that lead to harmonization and streamlining of information management and reporting on protected areas and other key sites.

Strategic recommendation 2.2: Encourage international protected area related agreements and programmes, including European regional initiatives, to make information available in a consistent and co-ordinated manner.

Strategic recommendation 2.3: Work to ensure that protected area related initiatives developed and implemented within Europe are managed in a co-ordinated and synergistic manner.

Strategic recommendation 2.4: Support initiatives that help identify international priorities for national action, so that policy decisions can be taken in the light of the best available information.

Practical:

Recommendation 2.1: Promote and support redevelopment of the World Database on Protected Areas, both as a source of basic quality-controlled information on protected areas, and as a standard catalogue of protected areas to which other information on sites and systems can be linked to facilitate access to the ever-broadening range of information available on protected areas.

Recommendation 2.2: Promote and support the Common Database on Designated Areas established by EEA, UNEP-WCMC and the Council of Europe, and encourage others working on protected areas information in Europe to collaborate rather than risk duplication of effort and adding to the burden of national agencies.

Recommendation 2.3: Promote the concept of protected area database rationalisation through the UN-mandated IUCN/UNEP-WCMC process at appropriate international fora. [The forthcoming CBD SBSTTA (2003) and COP (2004) meetings, with specific foci on protected areas, provide excellent opportunities for the Government to promote this approach, and to highlight its advantages for strengthening harmonized reporting in key conventions where protected areas are a feature.]

Recommendation 2.4: Encourage review of the nomination and reporting forms and processes for internationally recognised and designated sites, in order to assess whether there are opportunities for harmonization, synergy and streamlining of both the forms and the processes.

Recommendation 2.5: Encourage international agreement and programme secretariats to make all information available over the Internet, and promote and support development of co-ordinated and integrated access to this information to facilitate wider understanding of the relationship between the different initiatives and the ways in which they support nature conservation.

Recommendation 2.6: Consider supporting a stakeholder workshop specifically to review the availability of information relevant to protected areas and protected areas management, and the need for such information at national and international levels, with a view to contributing to the international debate on protected areas in the context of the World Parks Congress in 2003 and CBD discussion on protected areas in 2003 (SBSTTA) and 2004 (COP).

Recommendation 2.7: Consider supporting a stakeholder workshop to review the information available on international site networks and their associated initiatives, with a view to assessing the adequacy or otherwise of the information provided and making recommendations that will contribute to the international debate on protected areas in the context of the World Parks Congress in 2003 and CBD discussion on protected areas in 2003 (SBSTTA) and 2004 (COP).

Recommendation 2.8: Support agreement on a metadata standard for wetland inventories at the Ramsar Convention Conference of Parties, and encourage the Ramsar Convention to support development of a clearing-house for such inventories.

Recommendation 2.9: Encourage the EC/EEA to make information on sites in the Natura 2000 network available on the Internet, and to explore with other organizations how to relate this information to other internationally managed datasets such as the Ramsar database.

Recommendation 2.10: Support efforts by BirdLife International to increase access to information on Important Bird Areas through the Internet, and encourage them to explore ways to link this data to other related datasets such as the Ramsar database and information on birds covered by international legislation.

2.3 RECOMMENDATIONS ARISING FROM CLUSTER 3 - DEVELOPMENT PROJECTS AND OTHER DONOR INFORMATION

Strategic:

Strategic recommendation 3.1: Support moves to provide consolidated access to information on bilateral and multi-lateral assessments and donor projects with the intention of rationalising nature conservation aid delivery, reducing "competition" between donors, and increasing collaboration and effective targeting of priorities within the aid community as a whole.

Practical:

Recommendation 3.1: Encourage DfID to work with UNEP-WCMC to review their joint work under the Donor Information Sharing Project with a view to exploring how the project might be expanded to incorporate information from, and respond to the needs of, other bilateral and multilateral development assistance agencies.

Recommendation 3.2: Through the CBD Secretariat, support in principle and push for the development of a practical work plan to implement the requests set out in COP 6 Decision VI/16 as regards incorporating donor information in the CBD CHM, taking into consideration both the DfID funded Donor Information Sharing Project and the needs and interests of the GEF and OECD/DAC.

Recommendation 3.3: Encourage European agencies such as the EC DG Development to collaborate with these integrating and consolidating initiatives rather than duplicate efforts.

Recommendation 3.4: Encourage the OECD Development Assistance Committee to consider further the issue of compilation and sharing of information on biodiversity-related aid in the context of, inter alia, CBD COP Decision VI/16.

Recommendation 3.5: Encourage OECD Development Assistance Committee to work with other appropriate organisations to co-ordinate access to information on donor policies, both thematic and geographic, to facilitate co-operation in donor support.

Recommendation 3.6: Encourage UNEP-WCMC to continue work on co-ordinated access to country studies and profiles, while ensuring through stakeholder consultation that this work is fulfilling a real need.

2.4 RECOMMENDATIONS ARISING FROM CLUSTER 4 – CLEARING-HOUSE MECHANISMS AND INTEGRATED INFORMATION EXCHANGE NETWORKS

Strategic:

Strategic recommendation 4.1: Promote the rationalisation and concentration of focus of clearing-houses and other information exchange facilities.

Strategic recommendation 4.2: Encourage nature conservation clearing-houses to provide increased access to the science, technologies and methodologies, rather than simply to documentation and data.

Practical:

Recommendation 4.1: Encourage and support the further development of the CHM managed by the CBD Secretariat, in particular promoting moves towards an increased role in technical and scientific collaboration, and increased linkages between the CHM and implementation of programmes of work agreed by the COP.

Recommendation 4.2: Encourage and support the development of focussed thematic nodes of the CHM as defined in COP Decision V/14 closely linked to the needs of the Convention programmes (both current and future) including active consideration of the ways in which UK-based agencies might contribute.

Recommendation 4.3: Support and actively participate in meetings of CHM National Focal Points aimed at sharing experience and increasing collaboration between countries in delivering the CHM.

Recommendation 4.4: Encourage and support the actions of the European and UN agencies and others in seeking to make available publicly through user-friendly interfaces their information holdings, and where possible assist them in this process.

Recommendation 4.5: Using the Reference Guide as a starting point commission a research project with agency (preferably international) and NGO participation that develops guidelines for effective management and quality control of nature conservation information exchange systems, and for their adequate and stable funding.

Recommendation 4.6: Encourage NGOs and international agencies to focus closely the scope of information exchange facilities, to avoid duplication of existing services, and to link to national, regional and global "official" CHMs (noting the potential for greater UK influence and direction for rationalising information exchange and ensuring good linkages with the UK Biodiversity Clearing-House Mechanism.

2.5 RECOMMENDATIONS ARISING FROM CLUSTER 5 – ENVIRONMENTAL LAW

Strategic:

Strategic recommendation 5.1: Support efforts to rationalise further environmental law information holdings, thereby making it possible for policy-makers and others to obtain access to relevant information on international, European and national legislation through one integrated service.

Strategic recommendation 5.2: Support in principle that ECOLEX should be mandated to develop as the principal global provider of environmental legal information, collaborating with and drawing on other information sources (such as EUR-Lex) as appropriate.

Practical:

> ***Recommendation 5.1: Support a pilot project in the context of harmonization of national reporting that examines how legal information requested by treaty secretariats could routinely be linked to ECOLEX and made available through this central source, eliminating the need for duplicate maintenance and update.***

> ***Recommendation 5.2: Encourage MEA secretariats to collaborate in delivering legal information (texts, decisions, party lists, national implementation) in a consistent manner with the aim of moving towards a more distributed approach to the management of ECOLEX.***

> ***Recommendation 5.3: Support (through direct funding or encouragement of UNEP, EEA and IUCN) steps to improve the functionality and search capacity of ECOLEX, as well as promoting a full user-needs assessment of ECOLEX as a key stage in its future development.***

> ***Recommendation 5.4: Support through the European Commission the development of stronger linkages and reduced duplication between ECOLEX and EUR-Lex to ensure that EC legislation is available through ECOLEX (recognising that the best option would be technological linkages that would have EUR-Lex maintain the information with automated links to ECOLEX).***

> ***Recommendation 5.5: Consider supporting a workshop to consider how the information available on national legislation implementing CITES in each country can be made easily accessible and current to support customs officials in their work.***

2.6 RECOMMENDATIONS ARISING FROM CLUSTER 6 - GLOBAL AND REGIONAL LONG TERM ECOLOGICAL MONITORING

Strategic:

> ***Strategic recommendation 6.1: Encourage world-wide co-operation and integration of long-term monitoring programmes - especially seeking the rationalisation and integration of BRIM, ILTER and GTOS.***

> ***Strategic recommendation 6.2: Contribute to identifying the information needs for national and regional policy making and communicate these needs to the long-term monitoring programmes to assist in streamlining and focussing information collection.***

Practical:

> ***Recommendation 6.1: Identify priority ecosystems for UK interests, particularly reflecting the needs and values of UK convention obligations, and clarify the monitoring needs for these in the European and global monitoring programmes.***

Recommendation 6.2: Continue to encourage exchange of experiences between organisations within the UK, through funding support to such mechanisms as the UK Biodiversity Indicators Forum.

Recommendation 6.3: Provide specific guidance to the EEA on the type of information outputs required by DEFRA (and the UK in general) to guide policy, and define areas in which "pilot" projects in the context of Natura 2000 or PEBLDS would be helpful.

Recommendation 6.4: Support the proposal currently under development for the establishment of a European LTER (being prepared by a consortium involving NERC's Environmental Change Network for submission to the EC for funding).

Recommendation 6.5: Utilise the strengths of UK institutions, for instance by promoting the monitoring protocols of the UK Environmental Change Network as a model for programmes such as BRIM and ILTER.

Recommendation 6.6: Sponsor a meeting on how GTOS, ILTER, BRIM and other such monitoring networks can support the biodiversity conventions, possibly through a workshop hosted by CEH or UNEP-WCMC to develop ideas for wider discussion (noting that the UK has previously supported a similar meeting in the initial stages of development of GTOS).

Recommendation 6.7: Review the proposal for European Biodiversity Monitoring and Indicators Framework (EBMI-F) and consider to what extent the UK can contribute expertise and experience (e.g. of the Environmental Change Network) and ensure harmonization with global monitoring networks and indicator development.

Recommendation 6.8: Consider alternatives that would make GTOS more responsive to the needs of the biodiversity conventions and policy-makers, and connected to the GEO process. This may mean giving thought to the relationship between FAO and UNEP in the management and implementation of GTOS.

2.7 RECOMMENDATIONS ARISING FROM CLUSTER 7 – TAXONOMIC INFORMATION

Strategic:

Strategic recommendation 7.1: Encourage and support taxonomic initiatives that serve to support nature conservation and the needs of MEAs, pushing for pragmatic and useful harmonized systematics and co-ordination efforts that support well established, on-going programmes.

Practical:

Recommendation 7.1: Continue support to GBIF but recognise that any large-scale investment should wait until it is clearly demonstrated what role GBIF will play that is not currently undertaken by existing initiatives.

Recommendation 7.2: Promote and support moves to harmonize the taxonomies used by each of the different international agreements that have scheduled lists of species, where appropriate promoting the establishment of joint taxonomic working groups building on the expert groups that already exist.

Recommendation 7.3: Species 2000, as a UK-based existing and operational initiative merits support, although any possible institutional impediments to its progress should be investigated and attempts made to resolve these.

Recommendation 7.4: The European Natural History Specimen Information Network (ENHSIN) is not a high priority from a conservation viewpoint but is also an ongoing initiative that may merit support for its scientific work.

Recommendation 7.5: BioNET-International appears to play a valuable role in capacity-building in taxonomy in developing countries, and as such support of this initiative which is UK-based, will help the UK to fulfil its responsibilities as a developed country Party to the CBD in implementing the Global Taxonomy Initiative.

2.8 RECOMMENDATIONS ARISING FROM CLUSTER 8 – SPECIES STATUS INFORMATION

Strategic:

Strategic recommendation 8.1: It is recommended that whichever initiatives are funded are likely to benefit more from lower levels of support over longer time periods than from larger one-off injections of funds in the expectation that they will then become self-funding.

Strategic recommendation 8.2: Wherever possible, encourage all species databases to relate to each other and to reference common taxonomic standards.

Strategic recommendation 8.3: With most species information initiatives, the data-gathering, assessment and analysis stages are more likely to be rate-limiting steps than the technical aspects of data-processing, so that support may be better concentrated on the former rather than the latter.

Practical:

Recommendation 8.1: The species information systems initiatives most worthy of support are those that serve specific roles, with clearly defined applications and end users. At regional and global levels these include:
- CITES and the EU Wildlife Trade Regulation databases with information on species whose trade is controlled
- Red List information on globally threatened species
- Information on species used to identify wetlands of international importance under the Ramsar Convention
- Information on migratory species included in the appendices to the Convention on Migratory Species and the various agreements under the Convention (currently housed in the GROMS database)
- Information on species relevant to the Bern Convention and the Natura 2000 network.

Recommendation 8.2: The Red List programme carried out by IUCN in collaboration with a wide range of organizations has high international profile and merits support. In the future it is anticipated that the developing IUCN Species Information System will contribute substantially to this process, but to date many feel that the need for such a system has yet to be clearly identified.

Recommendation 8.3: At the national level explore how domestic information and data can be contributed most effectively to these international programmes, and how the expertise of UK scientists can be utilized.

Recommendation 8.4: Work with CITES, UNEP-WCMC and others to improve the information available to customs and other enforcement officials to assist in their work, especially as aids to identification of scheduled species.

Recommendation 8.5: Encourage the ARKive project to work closely with existing species information services to identify how its film, photographic and audio holdings can effectively contribute to these information services (for example in providing the photographic information that will help support customs and enforcement officials in their work).

2.9 RECOMMENDATIONS ARISING FROM CLUSTER 9 - POLICY AND STRATEGY INFORMATION

Strategic:

Strategic recommendation 9.1: Promote wider sharing of information on biodiversity policies and the environmental impacts of EC and global policies in all related sectors (in particular water, agriculture and fisheries).

Practical:

Recommendation 9.1: Identify ways to make better use of the EEA and in particular EIONET as a forum for biodiversity-related policy discussion between European countries, and for jointly identifying information requirements for taking decisions and implementing policy.

Recommendation 9.2: Encourage the CBD CHM to establish a clearly defined policy component where national, regional and global biodiversity-related policies can be posted and discussed. This would probably concentrate on wider circulation and perhaps analysis of implementation of Article 6(a) on National Biodiversity strategies and Action Plans, and Article 6(b) concerning integration with other sectors.

2.10 RECOMMENDATIONS ARISING FROM CLUSTER 10 - EUROPEAN NATURE CONSERVATION INFORMATION

Strategic:

Strategic recommendation 10.1: Support EC policy directions on the environment that seek to identify first the important policy decision needed, then the key information required to develop the policy and finally the information needed to assess the effectiveness of implementation measures.

Strategic recommendation 10.2: Support efforts that contribute to the reduction, streamlining and simplification of reporting within Europe and the integration of European reporting with reporting to MEAs.

Strategic recommendation 10.3: Support the development of harmonization tools that make nature conservation information comparable and useable, and streamlining tools that facilitate the process of information collection and use.

Practical:

Recommendation 10.1: Develop ways to improve connections between sustainable development and socio-economic aspects of "environment" with considerations of nature conservation. One implementation option is to constitute inter-departmental committees or similar bodies that consider the nature conservation consequences of policy (UK and EC) in agriculture, transport, forestry, fisheries, cultural heritage, development assistance and so on, and the information required to understand and inform on those impacts.

Recommendation 10.2: Improve UK participation in EIONET to provide better access and exposure to UK National Reference Centres (noting that currently the information on the UK EIONET node website is out of date).

Recommendation 10.3: Actively support the development of harmonization tools, particularly those associated with EEA and EUNIS. This means increased partnerships (UK NRCs) with the ETC/NPB particularly with respect to the harmonization initiatives of the EUNIS Habitat Classification (CEH is currently working on this), the Common Database on Designated Areas (UNEP-WCMC is working on this), and the synonyms module of the EUNIS Species Database. In this context, it would also be useful to promote compatibility of EU harmonization with global efforts (e.g. on species synonymy) in order to reduce duplication of effort.

Recommendation 10.4: Support efforts by the EEA to reduce and streamline reporting, for example, by continuing to support the development, implementation and use of the Reporting Obligations Database (Nature Conservation component researched by JNCC and UNEP-WCMC), while noting previous recommendations made by JNCC and UNEP-WCMC on this project.

Recommendation 10.5: Consider ways to reduce and streamline UK reporting (and other information-related obligations) to MEAs, the EC, the Council of Europe, OECD and other bodies. One step to achieving this may be to develop a tabulation of all nature conservation reporting obligations placed on the UK (based on the EU wide database already prepared by EEA) and use this to design national information systems to support these reporting requirements in a rational manner.

Recommendation 10.6: Ensure there are close ties and appropriate integration between the UK Biodiversity Clearing-House Mechanism, the EC CHM, and the Strategy Guide.

Recommendation 10.7: Make full use of national centres of expertise in contributing to European initiatives, for instance consider how the well-developed and respected monitoring protocols of the ECN could contribute to monitoring of SPAs and habitats under Natura 2000.

Recommendation 10.8: Support the EEA Data Service and other EEA-led efforts to increase access to the datasets it compiles, and contribute UK data and expertise as appropriate.

Recommendation 10.9: Avoid committing significant time to efforts that are not central to EU policy and those that are redundant or peripheral. To this end it might be useful to maintain a central inventory of nature conservation information initiatives both in the UK and in Europe – for instance an extension of the RINCIS database.

Recommendation 10.10: Encourage and support periodic review of EEA data collection to ensure the relevance of data holdings to policy generation and review, including review of formats of information delivery.

3 CROSS-CUTTING RECOMMENDATIONS

Cross-cutting recommendation 1: Encourage convention secretariats, international NGOs, UN organisations, and intergovernmental organisations to develop tools for integrated access to case studies and good practices in nature conservation and means to make these more accessible and searchable through improved metadata.

Cross-cutting recommendation 2: Encourage convention secretariats to review the extent to which current information sources could be used to meet present needs, including assessing the effectiveness of the treaty, and at the same time articulate information needs and invite major data custodians to review how they can support these requirements.

Cross-cutting recommendation 3: Encourage the agencies that hold policy-relevant information resources to provide improved metadata to such facilities as the EEA's metadata services in order to make information sources better known and available.

Cross-cutting recommendation 4: Work with the EEA and other bodies concerned with environment metadata to incorporate improved quality management information into metadata profiles and the WebCDS metadata tool.

Cross-cutting recommendation 5: Encourage the improvement of standardised vocabularies for indexing and searching for information, for instance by supporting the addition of biodiversity-related terms to GEMET, and seeking further harmonization of GEMET with UNEP's EnVoc.

Cross-cutting recommendation 6: Encourage the EEA to undertake a thorough review of the EC-CHM both to assess functionality and content, and to ensure that it is meeting the needs identified by the Steering Committee and Task Force meetings and the feasibility study.

Cross-cutting recommendation 7: Promote improved linkages between biodiversity databases within the UK and international information services and networks, particularly those national databases sponsored by Government or managed by Government agencies to meet their own needs.