

are managed for environmental or conservation purposes. The results are being used by FAO as a contribution to the *Forest Resources Assessment 1990 Project*. The overall database now includes data and location maps for some 33,000 protected areas, held on a FoxPro (IBM compatible) database.

3. Tropical Forest Database

In collaboration with IUCN, WCMC has built a database of tropical forest maps, at a working scale of 1:1 million, based on the most recently available sources. The data are held on a computerized geographic information system (GIS) (ARC/INFO) and are available for dissemination in digital or paper format. Some of the information has already been published in two volumes of a three-volume series, the *Conservation Atlas of Tropical Forests*. Coverage includes rain, monsoon, montane, swamp, and mangrove forests. The flexibility of the GIS enables overlay of the forest cover data with other relevant information, such as national parks coverage or population density, as a means of analysis and assessment. WCMC knows of no other global forest cover database held in digital form, although many partial datasets do exist, and have been used in this compilation.

4. Plants Database

As part of its species activities, WCMC maintains nomenclatural, distribution, and conservation status information for 62,000 species, subspecies, and varieties of plants worldwide (approximately 23% of the described higher plants). This taxon-based information is linked to 91,000 distribution records and 14,000 data source records.

5. Animals Database

WCMC publishes the *Red List of Threatened Animals* in collaboration with IUCN and the Species Survival Commission. All the data are held on computer, including nomenclature, common names, distribution, conservation status, threats, etc. An additional database lists endemic mammals and birds by country. The Centre is actively pursuing ways of preparing digital distribution maps for threatened animals and plants, but this work is at an early stage.

6. Trade Database

WCMC tracks the international trade in CITES-listed organisms through a database of more than 1.4 million records. These can be manipulated for specific reports and analyses.

7. Bibliographic and Manual Files

The data held in computer files and databases frequently represents only the "tip of the iceberg" in terms of the data held at WCMC as this data has been drawn from a wide range of references, most of which is held at WCMC. This includes a wide range of "gray" literature difficult to obtain elsewhere. A bibliographic database that can be searched and manipulated to meet users' needs is being developed to cover much of this information.

The above is by no means a complete account of the Centre's data holdings but may serve to give a preliminary indication of the resources which are available. [WCMC, 219c Huntingdon Road, Cambridge CB3 0DL, U.K.; TEL (44) 223-277314, FAX (44) 223-277136] ●

Biological Collections Databases Available on Internet

Internet provides unparalleled opportunities to make data from museum collections available (e.g., Miller, 1993, *Bull. Ent. Res.* 83: 471-474). Gopher servers have become popular interfaces for databases of many kinds. Museum collection data are only beginning to become available. The following list includes those collections databases known to me in March 1994. The list is probably incomplete and will, hopefully, be out-of-date soon.

All these databases may be reached via the Biodiversity and biological collections gopher at Harvard University, or via other gophers, some of which are listed below (except the U.S. National Fungus collection, available only via telnet). This list includes only databases dealing with specimen data, not those dealing primarily with taxonomic or other data and does not include living collections. Sizes of databases refer to approximate number of records; in some cases a record includes more than one specimen (e.g., a lot). A database is considered complete if it includes all the records available for the category suggested by the title. These databases include over 2 million records already and are growing rapidly.



SUBJECT	SIZE/COMPLETE
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PLANTS and FUNGI

Australian National Botanical Garden Herbarium	160,000 no
University Texas Herbarium type	4,000 yes
Harvard University Herbarium types	30,000 no
Farlow Herbarium diatom exsiccatae	13,000 no
California Academy of Science Herbarium types	9,000 yes
Smithsonian plant types	88,000 yes
Australian plant specimens (ERIN database)	800,000 no
U.S. National Fungus Collection (USDA)	550,000 no
Flora of Mount Kinabalu	16,300 no

INVERTEBRATES

Australian animal specimens (ERIN database)	50,000 no
Boulder County, Colorado insects	26,000 no
Museum of Comparative Zoology insect types	15,000 no
Museum of Comparative Zoology Microlepidoptera types	600 yes
Museum of Comparative Zoology spider types	? yes
University of California Museum of Paleontology invertebrate types	11,000 yes
University of California Museum of Paleontology microfossil types	? no

VERTEBRATES

Cornell University fish collection	70,000 ?
Museum of Comparative Zoology fish types	2,500 no
University of Texas (Austin) fish	22,000 ?
University of California Museum of Paleontology vertebrate types	7,800 yes
Slater Museum birds	20,000 yes
Neotropical fish collections (NEODAT Project)	280,000 no

GOPHER ADDRESSES

Australian National Botanic Garden	osprey.erin.gov.au 70
Biodiversity gopher at Harvard	huh.harvard.edu 70
Environmental Resources Information Network	kaos.erin.gov.au 70
NEODAT Project (Neotropical fish)	fowler.acnatsci.org 70
Smithsonian Institution	nmnhgoph.si.edu 70
University of California Museum of Paleontology	ucmp1.berkeley.edu 70
University of Colorado	gopher.colorado.edu 70

TELNET

U.S. National Fungus Collection	fungi.ars-grin.gov
access with "login user" and "user"	



[Scott Miller, Bishop Museum, Box 19000-A,
Honolulu, Hawaii 96817, USA; Internet: scottm@bish-
op.bishop.hawaii.org]

Biosystematic Information on Terrestrial Arthropods Program

For several years, plans have been discussed for creating a database of taxonomic information on insects and related arthropods on a continental or world scale (e.g., *Insect Collection News* 7:7-8, 8:9-11). The Systematic Entomology Laboratory (SEL) of the U.S. Department of Agriculture has now assumed leadership of this collaborative effort which includes the activities begun by the Entomology Collections Network. The project has been named Biosystematic Information on Terrestrial Arthropods or BIOTA.

BIOTA embraces a vision that within a few years a global network of information databases and other tools will allow truly global access to all available information on a species. This vision requires a database of all the species-group, genus-group, and family-group names, including synonyms, homonyms, misspellings, and significant misidentifications. This database will be the first and most essential technical backbone of a large array of specimen-based databases, GIS systems, catalogs by taxon or area, and automated identification systems. It will be a vital tool for standardization of names used in collections, databases, species-level syntheses, phylogenetic analyses, biodiversity prospecting, regulatory activities, product certification, and the like.

For logistic reasons, BIOTA is focusing first on North America (including Mexico and Hawaii). Data are already being accumulated and additional funding is being solicited to accomplish this phase in two years. As opportunity presents, data are also being gathered on a world basis. The global accomplishment of BIOTA will take 3-5 years following the North American database and will involve massive collaboration from arthropod systematists throughout the world.

The BIOTA database is an open-ended, multi-institutional project, and the database will be in the public domain, distributed through Internet and CD-ROM. The database will be continually updated, so the Internet version will be a definitive and current authority file for world arthropod names.

The BIOTA project involves many specialists and institu-