

[COPY]

*Biodiversity Convention and Strategy Section
Environment Australia
GPO Box 787, Canberra ACT 2601*

30th August, 2000

The Biological Diversity Advisory Council's "Biodiversity Research: Australia's Priorities" discussion paper

I write as President of the Society of Australian Systematic Biologists (SASB). Our Society welcomes the discussion paper, which addresses issues of vital interest and importance to our members and to Australia as a whole. The SASB represents the professional interests of 300 systematic and evolutionary biologists throughout Australia, including botanists, zoologists, parasitologists and mycologists. These scientists are responsible for studies on the taxonomy and diversity of Australia's biota.

Biological systematics encompasses the science of describing, classifying and naming organisms (known as taxonomy), as well as the science of reconstructing the evolutionary history of the organisms (known as phylogenetic analysis). Systematists are thus the scientists whose expertise provides the data on the identification, description, distribution and relationships of living organisms. All aspects of biological and environmental science rely on taxonomy and systematics. Much of life on earth is still unnamed and undescribed. We cannot quantify and manage biodiversity unless its basic units, the species and their relationships, are known.

There are many reasons why there is a great need for increased research on Australia's biodiversity, but one of the most basic is the fact that many of our native biota remains very poorly known, and much of it is as yet unknown. The document, while acknowledging the need for taxonomy, does not sufficiently emphasise the fundamental role that this discipline plays in biodiversity research. Taxonomy provides the means of communicating about taxa, for example enabling the species and other taxa in different biodiversity studies to be accurately compared. Systematics, which incorporates taxonomy, includes all-important phylogenetic studies that produce hypotheses about the relationships of organisms. Modern phylogenetic studies are based on a wide range of information including morphology, ultrastructure and molecular data. These enable predictive statements to be made about taxa, regarding their biology (feeding, life history etc.) and ecology. The words "systematics" or "phylogeny" do not even appear in the document.

The incorporation of systematics (including taxonomy) must be an essential component of any successful biodiversity research strategy. While much of the infrastructure that is needed for this work is in place, resources are often lacking. The need for more taxonomists is great. Some major animal groups remain virtually unknown, as do many groups of fungi and single celled organisms. Even in some of the better known invertebrate groups over half of the species that are known to exist remain unnamed. Even with the very large number of already named taxa, identification of the organisms found in biodiversity studies remains a major problem in most invertebrate groups, non-vascular plants and single celled organisms. Given that one of the identified areas of research of National importance is the listing and characterisation of indigenous species and to "record their distribution and habitat requirements", there will be a need for much greater resourcing of systematics than there is at present. A great contribution has already been made by the Australian Biological Resources Study (ABRS), particularly with regard to flora. However, ABRS remains relatively poorly funded, as do the systematics programs in the state museums and herbaria where most of the taxonomic work is undertaken. There is an urgent need for information and

identification resources, such as those that already exist for much of the flora, to be developed for animals and non-vascular plants. We strongly support the recent development of the web-based Australian Biological Information Facility (ABIF) and acknowledge that this is potentially the kind of resource that will best facilitate the use of basic biodiversity information -- especially with the incorporation of illustrations, distributional information and interactive keys.

Australia has an almost unique opportunity to obtain a reasonably complete inventory of its megadiverse biota. Most of the available information resides in collections in museums or herbaria and it is pleasing to see that this is recognised in the document. However, most of these institutions have seen reduced funding and personnel in recent years. Yet, they offer an opportunity to provide a national facility that has not yet been realised in any other country. The concept of a virtual national museum is mentioned in the discussion paper and is not a new one. As noted, this has already been developed for plants through linking databases in several Australian herbaria, although much of the available herbarium data has yet to be added.

National funding to assist with the processing, digitising and curation of our existing biological collections should be an essential ingredient in any biodiversity strategy -- we need to know what we already have collected, where and when it has been found and what it is called, so that we can effectively utilise the huge amount of existing data. These data can enable the identification of areas of high diversity, areas important for narrow range endemics, the more effective planning of biodiversity field programs, conservation strategies, the examination of historical trends, recognition of invasive species etc. We recommend that the Commonwealth provide a means where funding can be obtained for collection development and digitisation -- perhaps under a similar program to that provided by National Science Foundation in the U.S.A.

While a 'virtual museum' will clearly not produce a complete synopsis of our national biodiversity, it is undoubtedly the most cost-effective means of obtaining the best possible picture at this time.

Clearly there is an ongoing need for adequately funded systematics research and biological collections, the results of which can be fed into web-based facilities such as ABIF and the 'virtual museum', making these services interactive, useful, progressive, and the world's best biodiversity resources.

The Society would like to congratulate those involved in putting this plan together. However, we strongly urge consideration of the fundamental ingredients outlined above that are needed to enhance and strengthen this strategy.

Yours sincerely,

Dr Winston Ponder
President, Society of Australian Systematic Biologists
c/o Centre for Evolutionary Research, Australian Museum
6 College Street, Sydney 2010 N.S.W.