

**THE HERBARIUM AND THE PROPOSED
DEPARTMENT OF LAND MANAGEMENT**

**A submission on the Interim Report,
November 1983**

TABLE OF CONTENTS

	Page
INTRODUCTION	1
TAXONOMIC RESEARCH	2
IDENTIFICATION SERVICE	4
FLORA HANDBOOK WRITING	4
CURATION OF COLLECTIONS	5
INTER-DEPARTMENTAL CONTACTS	5
FIELD SURVEY AND ECOLOGICAL RESEARCH	6
CONSERVATION	6
NEW ADMINISTRATION	7
ADDITIONAL REQUIREMENTS	
REFERENCE HERBARIUM	9
ADDITIONAL STAFF	10
DATA BANKING	12
CONCLUSION	13

INTRODUCTION

This submission is presented privately by three research botanists from the Western Australian Herbarium. We all have considerable experience working in Australian and overseas botanical institutions and are familiar with the processes of biological research and the organisation of Western Australian research institutions.

For the most part we intend this submission to support and amplify the points made in the formal submission presented to the Task Force by the Curator of the Western Australian Herbarium.

We believe that the current policies by which diverse Government departments and agencies independently administer parks, reserves, forests, vacant crown land and road verges in Western Australia are grossly inefficient. The present situation favours the production of narrowly conceived management plans aimed at protecting individual species of plants or animals or forests. Were the considerable expertise in existing Government departments to be co-ordinated, expanded and guided, under the direction of a single department, the production of comprehensive ecosystem management programmes would be possible. Thus we strongly favour the Task Force proposal.

It is clear that the future of the Western Australian Herbarium rightly lies with the proposed Department of Land Management where it can pursue its essential, highly productive taxonomic research and hopefully expand to cope with the increased service demands which we anticipate will come from the impetus given to biological survey work by the establishment of the new department.

We are confident that the Task Force is familiar with the existing role and current activities of the Herbarium. However, some important facets need to be stressed.

TAXONOMIC RESEARCH

Interaction between herbaria is vital to their proper function. These wider aspects of the Western Australian Herbarium's operations must be fully recognised and supported by any department inheriting its administration. The Australian herbaria are linked closely by the Committee of Heads of Australian Herbaria which meets annually. Agreements made at these meetings enable co-ordination of specimen loans and ensure that there is no duplication of research effort. The exchange of specimens, including nomenclaturally important "type" specimens, most of the latter being housed overseas, is a scientific necessity. Specimens essential to taxonomic study of Western Australian species and often comprising unique records of their geographical occurrences are held in herbaria throughout the world. This Committee also selects

and, in conjunction with the Commonwealth Bureau of Flora & Fauna, appoints each year the Australian Botanical Liaison Officer. The liaison botanist is stationed at the Royal Botanic Gardens, Kew, from where he can consult the vast botanical collections and libraries of European herbaria, of vital importance in facilitating the work of his Australian colleagues.

The present number of taxonomic botanists working in Western Australia would not be sufficient for the task of completing the necessary critical studies of the state's rich flora were it not for the co-operation of other herbaria in Australia and overseas. Our flora is poorly documented. We estimate that approximately 80% of known genera need taxonomic studies in order to define their boundaries and those of their constituent taxa. Further, of the 8,000 known species in Western Australia only about 2,500 are sufficiently circumscribed to enable reliable identification. The urgent need for taxonomic research is also indicated by the fact that contemporary studies of Australian genera have resulted in up to 100% increase in the number of species recognised and named. A high proportion of these entities are Western Australian.

Many botanists at the Western Australian Herbarium are committed for the next 15 years to providing input to the Flora of Australia project. Three volumes of this ongoing comprehensive series have already been published by the

Bureau of Flora and Fauna. A significant part of this work is funded by the Australian Biological Resources Survey, a Commonwealth body providing finance for technical assistance and field work as well as supporting visits by researchers to other herbaria.

IDENTIFICATION SERVICE

Properly, the service role of the Western Australian Herbarium has been rationalised in the last six years in order to encourage botanists to devote more time to taxonomic research. Currently the majority of the identification work undertaken by the herbarium is of a routine nature and is handled by a Technical Officer, level G-II-5/6, supervised by a professional scientist who also provides expert advice on critical matters including forensic and economic botany.

FLORA HANDBOOK WRITING

Five botanists are involved in the writing of a series of regional Handbooks to the Flora. The first of these, currently nearing completion, will provide a means to identify the plant species of the Swan Coastal Plain and part of the Darling Range. This work is heavily dependent on revisionary research carried out at our own herbarium as well as expert assistance from interstate and overseas. The Curator has directed that the Herbarium proceed with the Handbook to the Flora of the Kimberley Region in 1984 to be followed by one covering the Pilbara Region in 1986.

CURATION OF COLLECTIONS

The Herbarium's collection of 350,000 specimens is continually being curated by botanists as new species are described and knowledge of existing ones increases. This represents a massive task, requiring time-consuming reading, checking and labelling. In order for the Herbarium to fulfil its roles as a repository for records of the flora of Western Australia and as a research source it is essential for the collection to be well curated. Given the richness of the indigenous flora and the dramatic recent increase in taxonomic literature there is a patent need for additional staff to service curatorial needs.

INTER-DEPARTMENTAL CONTACTS

The Western Australian Herbarium facilities are open to all scientific research workers interested in naming plants or obtaining data from specimens or from their accompanying documentation. Staff constantly interact with biologists in other departments and agencies considered by the Interim Report. In particular, Kings Park and the Department of Fisheries and Wildlife very frequently use the Herbarium as a base for their studies.

FIELD SURVEY AND ECOLOGICAL RESEARCH

Initially at least, there will be a lack of trained plant ecologists in government service for the proposed department. Most taxonomic botanists are concerned that they may be required to change or reduce their emphasis on taxonomic research in favour of ecological field work or servicing the expected increased identification load.

Although prior to 1981 the Herbarium staff included a plant ecologist, its vegetation survey activities are now minimal and almost entirely restricted to a few parts of the Kimberley region. Instead, ecological work has been carried out by the Department of Fisheries and Wildlife. The further development of this field will require new staff.

CONSERVATION

Currently the Herbarium plays an indirect but highly significant role in conservation. The data accumulated by the taxonomists in their researches are used extensively by ecologists and botanists concerned with rare species, proposals for new reserves, vegetation rehabilitation, classification of roadside verges, environmental impact studies and commercial flora exploitation.

NEW ADMINISTRATION

Hitherto the Western Australian Herbarium has enjoyed a semi-autonomous position within the Department of Agriculture. We are deeply concerned that the proposed Land Management Department may appoint to key administrative positions senior staff from present departments: their attitudes may not be in the best interests of conservation or the taxonomic research role of the Western Australian Herbarium.

If as suggested, there will be more effective ecosystem management because of more efficient resource deployment, then the Herbarium can expect an increased volume of identification, specimens to prepare and pressure for the compilation and processing of label information.

We would welcome greatly increased utilisation of the Herbarium. However this clearly requires augmentation of Herbarium facilities to avoid wear and tear on the research collection and to ensure the continuation of an efficient and appropriate identification service.

We envisage the establishment of a separately roomed, adequately staffed, comprehensive reference herbarium of the kind employed so successfully elsewhere in Australia, for example in the Herbarium of the Adelaide Botanic Gardens. An educational training service based on the reference herbarium, a small reference library and a self-help identification laboratory with microscopes, all for public use could also be developed.

We note that there is considerable overlap between some of the activities of Kings Park and those of the Herbarium. One advantage of administratively combining the two is that the extensive Kings Park Herbarium, which houses vouchers of botanic gardens plants and seed sources, has duplicate specimens housed in the Western Australian Herbarium and thus could form an excellent basis for the proposed reference herbarium. This, and additional staff requirements, are discussed below.

Because of the importance of plants in ecosystems, we are convinced that computer data banking of specimen label data will be of vital importance to land management studies. This has been demonstrated by the successful development and use of such a system at the Queensland Herbarium. As in their case, it is anticipated that special funding will be necessary for the establishment phase of a similar information retrieval system. Currently, we have access to the central computing facilities of the Department of Agriculture; if the Herbarium is to be incorporated into another department, appropriate administrative arrangements will have to be made.

We would also point out here that our present Librarian is allocated to us, full-time, from the Department of Agriculture and is not a formal member of the Herbarium staff. Were we to be severed from the Department of Agriculture a more permanent arrangement would be essential.

We draw the Task Force's attention to a serious discrepancy between the Herbarium budget cited in the Interim Report and actual expenditure. Several significant items are met by the Department of Agriculture's general budget rather than directly by the Western Australian Herbarium itself. Notably, this includes finance for publications, vehicle replacement and servicing, postage and insurance of several hundred boxes of loan specimens. We estimate that the actual expenditure of the Herbarium is in the order of \$200,000 per annum more than the figure specified in the Interim Report.

ADDITIONAL REQUIREMENTS

Reference Herbarium

An area of suitable size exists underneath the north wing of the present Herbarium building. Were this inexpensively enclosed, it would provide space for the reference herbarium as well as working areas for identification, reception, and room for a supervising botanist. As we have suggested above, the Kings Park Herbarium could provide a nucleus for the proposed reference collection, supplemented by specimens currently reserved by the Western Australian Herbarium for this purpose.

The present Herbarium extension botanist and technical assistant would readily be able to cope with the supervision of an established reference herbarium and its curation. We anticipate minimal additional staff demands.

a. Establishment by means of a non-recurrent grant:

- (i) Technical assistance;
- (ii) Modification to existing building and furnishings;
- (iii) Preparation and mounting of reference specimens;
- (iv) Purchase of small reference library;
- (v) Provision of dissecting microscopes.

b. Continuing maintenance costs.

Additional Staff

Although we currently have five technical staff, one is involved full-time in the identification service and another full-time in general supervision, editing and loan processing. Hence only three are normally available for general technical assistance. We believe this to be inadequate to service the present needs of ten research botanists and the curatorial demands of the Herbarium. With the anticipated increased utilisation of the Herbarium and the development of new functions such as the reference herbarium and data banking, the current unsatisfactory situation can only be worsened. There is, therefore, a demonstrable need for increased technical staff.

Because of the inordinately long time required to complete taxonomic research on the flora it would be desirable to increase professional staff. In its discussions with us, the Task Force has indicated its realisation of the lack of invertebrate animal studies in Western Australia. We believe that the study of lower plants has been seriously neglected in this State and will prove no less valuable in the context of the proposed Land Management Department. Lower plants which include algae, fungi, lichens, mosses and liverworts, require the attention of botanists with special post-graduate qualifications and cannot be dealt with effectively by present Herbarium staff.

We anticipate increasing attention to wetland management by the new department. Algae, which form a vital component of these ecosystems, have hitherto been largely ignored especially in the case of non-marine species. There is an immediate need for an algal taxonomist in Western Australia.

Balanced ecosystem research requires fungal studies, an important component of which relates to their taxonomy. Fungi play a vital role in many ecosystems. For example they are essential to forest trees and, we surmise, to heathland plants: their role as animal food sources is acknowledged. Taxonomic studies in Australian mycology are in a lamentable state. We are informed that the small mycological collection presently housed in the Botany Department, University of Western Australia will eventually pass to the Western Australian Herbarium. If

this is the case then at least one mycologist should be employed for its curation and to carry out fungal taxonomic research.

The Herbarium has an extensive, well-ordered Lichen collection. None-the-less, its effective use is of little practical benefit without a lichenologist. The lack of such an expert will become more acutely felt with the development of comprehensive ecosystem research.

We perceive a similar though less urgent need for studies on mosses and liverworts.

Data Banking

In conventional herbarium collections, the physical ordering of the specimens by species name is the sole key to the data, which must be retrieved manually. Modern land management needs demand rapid, automated retrieval of information by, for example, geographic location, vegetation and soil types, flowering time and date of collection. The setting up of a computerised bank of specimen data is a costly exercise which, in the few cases where one has been established, required special funding. Data banks of the specimen records at the Western Australian Herbarium would be extremely valuable and increasingly necessary to ecosystem research.

a. Initial costs:

- (i) Funding of a preliminary planning study;
- (ii) Financing for an appropriate period a contract team including a supervisor, programmer and data entry operators;
- (iii) Purchase of computer equipment;
- (iv) Building modifications.

b. Ongoing costs:

- (i) Data entry operator;
- (ii) Computer maintenance.

Conclusion

We wish to reiterate our enthusiasm for the general concept of a Land Management Department of which the Western Australian Herbarium should be an integral part.

It is hoped that the various points raised in this submission are found to be valuable in the preparation of the final report of the Task Force and indeed in future detailed planning of the proposed department if the plan receives government support. Each of us would indicate here our willingness to be personally involved in future planning activities.

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