



NEWSLETTER

Royal Botanic Gardens
and National Herbarium

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THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION DATABASE

Joe Swartz

The major function of the ANPC database will be to service the objectives of the National Endangered Species Collection and to assist integrated plant conservation activities in Australia. At its core will be a list of rare or threatened Australian plants (the ROTAP list), which will be updated as revisions are published. Based upon this central reference list of taxa, the database will compile the following data:

- a). The occurrence and availability of plant accessions in living collections of botanic gardens and other ex situ collections in Australia.
- b). The verification, original collection details and sufficient propagation history to establish genetic and provenance integrity.
- c). Descriptions of these plants and observations of plants both in situ and ex situ which may aid identification, conservation and cultivation.
- d). Details of provenance and population which may aid cultivation and other integrated conservation activities.
- e). Documentation and a bibliography on the horticultural methodologies used and/or recommended for the propagation and cultivation of plants listed in the database.



Grevillea sp. nov. (Tumut).

A newly discovered species that is highly endangered, drawn by Faye Davies, ANBG.

f). A register of plant recovery, re-introduction and ecological restoration programmes.

g). A list of rare or threatened species available in the horticultural trade and of the major nurseries stocking them.

Using a relational model and Oracle software, the database is being developed in co-operation with the Australian National Botanic Gardens. It is intended to accommodate necessary standards (HISPID, ITF), and to make the resulting application(s) available to ANPC members as a PC-package.

JOE SWARTZ began working for the ANPC in July under contract to develop the ANPC database. This work is being funded through a grant from the Endangered Species Program of the Australian National Parks and Wildlife Service. Joe received a B.A. degree from Washington University and a Ph.D. degree from Cornell University in America, both in physics. He later worked in England on the application of physics to archaeology and anthropology. In Australia he has worked on the recording and registering of Aboriginal sites. And, more recently, he has been involved in the conservation of traditional non-hybrid food and medicinal plant varieties, through seed collection and networking of seed collectors. Before July, he worked at the Australian National Botanic Gardens on the IBIS database development.

FIRST ADVISORY COMMITTEE MEETING

The first meeting of the ANPC Advisory Committee took place on 21 May, 1992, at the Australian National Botanic Gardens, Canberra. As this was the first meeting, and as several members were not totally familiar with the background to the ANPC, much of the morning session was taken up with a briefing on the thinking behind the setting up of the ANPC and on the role of the Advisory Committee. It was explained that ANPC's primary role was the conservation of Australia's native flora but that it will provide assistance to others in the Australasian region wherever possible. The ANPC already works with the Endangered Species Unit of the Australian National Parks and Wildlife Service and the two are seen to have complimentary rôles. ANPC's primary involvement in in situ (on-site) conservation work is expected to be through recovery plans and through promotion of conservation and advice on species management. The involvement of aboriginal people was discussed and it was stated that the ANPC will seek advice and comment from aboriginal communities as major land managers, acknowledging their traditional knowledge of plant uses.

Staffing for the National Office was discussed. It is intended that a part-time staff member will be employed soon and the consultant is currently working on the development of the ANPC database.

WORKSHOP FOR STUDY GROUP LEADERS

The ANPC will conduct a workshop for leaders of SGAP study groups in October. The aim of the workshop will be to share ideas on collecting, curating and propagating plants, on study group administration and on communications and media skills. It is intended that a small manual will be produced for the guidance of study groups. Participation will be restricted to study group leaders; it is hoped that this will be the first of several workshops to be organised by the ANPC.

CONFERENCES AND WORKSHOPS

THE STRATEGY OF INDONESIAN FLORA CONSERVATION KEBUN RAYA BOGOR CONFERENCE BOGOR INDONESIA, 20-23 JULY 1992

The 'Strategy of Indonesian Flora Conservation' was held as part of the 175th anniversary of the Bogor Botanic Gardens and the 25th anniversary of the Indonesian Department of Science. The purpose of the Conference was to discuss plant conservation in Indonesia and the development of a co-operative effort among the country's various conservation organisations. It was attended by representatives of a range of Indonesian organisations as well as several overseas delegates. Two papers were presented by members of the ANPC (Carrick Chambers, Director, Royal Botanic Gardens, Sydney and Mark Richardson, Australian National Botanic Gardens, Canberra), and three other Australian gardens were represented, namely Adelaide Botanic Gardens (Brian Morley), Darwin Botanic Gardens (Glenn Wightman) and the Royal Botanic Gardens, Melbourne (David Albrecht). Mark Richardson and Geoff Butler stayed on after the Conference (along with Peter Wyse Jackson of Botanic Gardens Conservation International) to assist with the publication of the Proceedings.

It was generally agreed by all delegates that the Conference was very successful. The opening of the Conference by President Soeharto did not go unnoticed by the media and both the botanic gardens and plant conservation have received a considerable boost (in interest, if not, at this stage, in action). Not only was the Conference valuable in terms of giving a good insight into plant conservation in Indonesia but it was also possible for ANPC to make a definite contribution.

During the Conference, workshops concerning the establishment of a network of organisations involved in plant conservation, were held. There was a general agreement that co-operation among the various Indonesian agencies is needed. In conjunction with the Indonesian Botanic gardens and BGCI, Mark Richardson and Geoff Butler are now writing a proposal for the plant conservation network that is to go back to delegates for ratification. The detail of the network will be based on the information that was collected from the workshops.

The basic proposal will not be dissimilar from that for the Australian Network for Plant Conservation. The fact that the basic design of the ANPC can be used in a country that is politically and culturally quite different from Australia is pleasing. It is planned that the proceedings and proposal will be completed in the next three months (Dr Suriman's promise, not ours!)

HOW GREEN IS MY PRACTISE?

Stuart Donaldson, Australian National Botanic Gardens

The practises of professionals engaged in management of the environment may significantly affect vegetation and its associated wildlife. 'How Green is my Practise?' was a day seminar held by the Australian Institute of Horticulture (NSW) Council on the 26 June 1992. Four speakers addressed four contemporary views on our horticultural management past, present and future.

The first speaker, Jim Longworth, spoke about the 'Due Diligence Program' (duty of care) and the draft Australian Standard on "Environmental Management Systems" (EMSs). These EMSs will facilitate compliance with environmental legislation, organisational policies and accreditation schemes for environmental management. Peter Albery stressed the need for ground water control, especially total site reticulation systems for nurseries, to control soil borne diseases and pests such as pythium, nematodes, etc. and chemical run-off, including nutrients such as phosphates and nitrates running off to 'Natural' areas. Peter also mentioned the on again-off again individual state Nursery Accreditation Schemes, which focus on hygiene but fail to address the major issue of environmental pollution.

Bush Regeneration was Robin Buchanan's topic and she used the Sydney area as an example. She cited the following problems; urban development along ridge lines allowing run off of detergent, fertiliser and chemicals into 'natural' areas, changing the balance in favour of exotic species; the near total destruction of the environment to development and the introduction of invasive species into urban areas. Stuart Pitagree took a global look at the energy expended to access materials including feasibility of recycling, and production of recyclables. He advocated the avoidance of petrochemicals and other known toxic materials, the utilisation of existing soft landscape options in designs and the inclusion of water harvesting in all designs. He stated that any development's impact on wildlife should be monitored and educational institutions need to address long-term sustainability of development and wildlife.

INTO THE MELTING POT (PONDERINGS, PROCESSES AND PROBLEMS)

A Conference on Urban Bushland Management,
held at Glenview Conference Centre, Sydney, May 21-22

Carolyn Porter, Royal Botanic Gardens, Sydney

The Conference was attended by council bushland managers, bush regenerators, ecologists, associated government departments (Planning, Water Board, National Parks and Wildlife), and interested individuals. Topics for discussion included: biodiversity, habitat fragmentation, wildlife conservation, genetic integrity, revegetation and fire management.

In his opening address Dr Peter Bridgewater, Chief Executive Officer, Australian National Parks and Wildlife Service, placed urban bushland remnants into context as areas of biodiversity (not exclusively the domain of national parks) and as an educational resource. He stated that the Australian Government would be represented at the 'Earth Summit' in Rio de Janeiro in June, where Australia's draft strategy for the Conservation of Biodiversity would be presented 'to ensure that Australia's biological diversity survives and flourishes'.

Dr Marilyn Fox, Senior Lecturer, School of Geography, University of NSW (Sydney) reiterated the principles of the Equilibrium Theory of Island Biogeography and its relationship to fragmented bushland areas and design principles. Her suggestion was that perhaps we may have to accept simplified communities in urban bushland and have aesthetics and education as the main goals. How this related to some basic processes occurring in fragmented urban bushland, appeared to be not clearly understood by some of the audience.

Dr Stella Humphries, CSIRO, Division of Plant Industry, author of 'Biological Invasions of Australian Ecosystems', gave a national perspective. Habitat vulnerability to weed invasion may provide the focal point for rare or threatened plant conservation. Examples of habitats noted as being most vulnerable included drainage lines (creeks and rivers); medium vulnerability included agro-pastoral land and tropical wetlands; least vulnerable: large-tract temperate forests, upland wet tropical forests and mangroves. Inadequate control of nursery imports and sales received much criticism. This became one of the conference resolutions: to stop the nursery trade in species recognised as urban weeds, although these are not prohibited imports or declared noxious.

Mr Doug Benson, Senior Ecologist, National Herbarium, Sydney, stressed the importance of maintaining the genetic integrity of bushland remnants. Even though a reserve may not have a rare or threatened plant present, the local variation in species may be important. Dr Adrian Daniell, Assistant Lecturer, School of Biological Sciences, La Trobe University, supported the latter from the viewpoint of genetics and discussed the theoretical consequence of small populations. The scientific significance of the latter two speaker's subject matter appeared to be missed by some of the audience who thought they were in conflict. Mr Peter Smith, Senior Land Management Officer, Conservation and Land Management, (NSW). Mr Smith was (unfortunately) an exponent of the trend to define the value of an urban bushland reserve and the development of a plan of management accordingly. During his talk Mr Benson had warned for scientific reasons against this categorisation.

Points of concern raised in workshops included: the slow rate of natural regeneration in rural areas; areas of natural bushland in rural areas being not large enough to provide required quantities of seed stock for revegetation; the continued clearing of urban bushland in Sydney and the need for more interaction between scientists and the public.

Finally Mr Andrew Staker, Landscape Designer, Royal Botanic Gardens, Melbourne, reminded us all to remember the 'three Rs':

- Retain the areas of urban bushland we have left;
- Regenerate where possible;
- Revegetate only as a last resort.

The Conference was successful as it provided an opportunity for the discussion of issues, problems and processes associated with urban bushland management.

THE ARID BOTANIC GARDENS NETWORK

Lyn Meredith, ANPC

In August I attended a meeting called to consider the establishment of a network of botanic gardens in the arid region of Australia. The arid region was one of the areas of Australia considered in the 1984 report, 'Native Plants in Australian Botanic Gardens and Arboreta'¹ to be lacking in botanic garden coverage. In fact, during the survey of botanic gardens² carried out in 1987, only one, the Olive Pink Flora Reserve at Alice Springs, was active in the arid zone, and in fact that garden is still the only one currently in operation as a regional botanic garden of Australian plants. But several others are planned and representatives of some of these took part in the meeting, held at the Araluen Centre in Alice Springs. Organiser and Chair of the meeting

was Tony Johnson, Parks Superintendent of the City of Port Augusta, who has responsibility for the development of the Australian Arid Lands Botanic Garden in that city.

Alan White welcomed participants on behalf of the Conservation Commission of the Northern Territory. A number of speakers outlined proposed botanic garden developments, the first being the exciting new Desert Flora and Fauna Park to be established at Alice Springs by the Conservation Commission of the Northern Territory. Alan Ginns and Bruce Thompson described the concept plan for this huge project which will occupy nearly 800 hectares of land at the base of the MacDonnell Ranges and will incorporate integrated wildlife and habitat exhibits, a visitor centre, an area of botanic and recreational parkland, plus support services. Detailed planning is now underway and preliminary on-site work is expected to start soon. Also described were planned botanic gardens at Mildura, outlined by John Irvine, the first stage of which will be opened later this year and three possible botanic garden projects in western Queensland; at Mount Isa, Longreach and Barcaldine, all described by landscape designer, Lawrie Smith. Dr John Millington described plans for a botanic garden in Kununurra, to be called the Botanic Garden of Tropical Western Australia which will cultivate the flora of the Kimberley and other regions, possibly augmented by a network of smaller gardens at Karratha, Port Headland, Broome and Derby. Kununurra, of course has ample water supplies from the Ord River project, whereas the other towns of the region are less fortunate. Tony Johnson gave an update on the status of the Port Augusta project and Simon Smith and Clarrie Smith (not related, it's just a fairly common name, apparently) spoke about the Olive Pink Flora Reserve in Alice Springs, which is carrying out conservation work on the central Australian flora.

Brian Morley represented the Council of Heads of Botanic Gardens, Leslie Lockwood was an observer on behalf of the Australian National Parks and Wildlife Service and the writer represented the Australian Network for Plant Conservation. A decision was made by the participants to form an Arid Botanic Gardens Network, to provide a forum for discussion of common concerns and liaise with the 'major' botanic gardens through the Council of Heads of Botanic Gardens. It was felt by several participants that it would not be appropriate for them to attempt to broaden the Network into an Australia-wide body, but they would encourage the establishment of similar bodies which could eventually link with this, a 'first' for regional botanic gardens. The ANPC would certainly support such regional networks and we look forward to hearing of similar moves being made by botanic garden managers or proponents to help develop a national network.

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Robert Tucker (1955-1992)

It is noted that on May 19th one of Australia's most colourful, dedicated and controversial conservationists passed away after a long illness. Robert Tucker will be remembered by those who attended the 1991 'Protective Custody?' Conference in Canberra for his forthright comments and criticisms of our established botanical institutions. His boisterous public persona unfortunately clouded the important contribution which he otherwise made to Australian tropical botany.

Although he admitted being an informally trained botanist, Robert's knowledge grew from his spiritual affinity with the Australian bush, together with an extremely perceptive and remarkable memory for plant and habitat details, and from many years experience in the field, particularly on Cape York Peninsula and the rainforests of north-eastern Queensland and Malaysia.

Robert's first 'love' was the Pandanaceae, a family which is presently misunderstood and poorly studied in Australia. The species *Pandanus yalna* R Tucker was described by Robert in 1986 (*Austrobaileya* 2 [3]). A passion for pandans resulted in Townsville Botanic Gardens developing what is considered to be one of the most comprehensive collections of Pandanaceae in the world, numbering approximately 100 species. His death has interrupted important work on the Australian Freycinetia and denied us the probable author of Pandanaceae for the Flora of Australia.

Through association with Townsville Botanic Gardens, administered by Townsville City Council, Robert co-ordinated and oversaw the development of The Palmetum, a Bicentennial Project-funded venture, and Townsville's third botanic garden. The accolades received from the success of the project have been many, including a Royal Planning and Design Institute of Australia award of excellence in 1989. The Palmetum contains important collections of Araceae, Zingiberaceae, Pandanaceae and tropical rainforest trees. A collection focussing on ecology and conservation was promoted by Robert and Townsville Botanic Gardens now houses at least 40 taxa which are declared rare or threatened.

Robert's journalistic talents produced numerous interesting articles and papers and his only book, *Palms of Subequatorial Queensland*, was published in 1988. Robert's ashes were scattered beneath a *Borassus flabellifer* in The Palmetum, a request he made only days before his death

John Dowe, Townsville Botanic Gardens.

TWEED SHIRE COUNCIL LOOKS TO THE FUTURE PRESERVING ITS RARE OR THREATENED TREES

Michael Healey
Tweed Shire Council

Diploglottis campbellii, (the 'small-leaved tamarind'), an endangered rain forest species in the Sapindaceae family, is known from only a few sites on the north coast of New South Wales and south-east Queensland, with only 2 to 3 trees recorded at each site. The tree appears on the Tweed Shire Council's coat of arms.

The Council's rare and endangered tree register was implemented in 1987 after local residents of Mt Warning Road discovered that a well-known specimen of *Diploglottis campbellii* had been damaged by Council's road clearing crew. This prompted the Tweed Shire Council to have the tree tagged to prevent this occurring again. It was suggested that all rare, threatened and significant trees should be tagged and recorded to protect them from future damage. Council passed an official resolution to establish a rare and endangered tree register, together with a

listing of significant trees.

As senior arboriculturist within the Recreational Services Division, I had attended various rainforest seminars and courses as part of the Council's training programme. After discussions with the Manager of Recreation Services, Roger Pettifor, it was decided that I would undertake this project, as, apart from aquired skills, I had an enthusiastic interest in local rainforest flora and the environment. The project thus became one of great personal satisfaction.

We consulted authorities on the subject, such as Mr John Hunter of the New South Wales National Parks and Wildlife Service and Mr Alex Floyd of Coffs Harbour, both of whom had some records of locations of species in the shire and they also assisted in identifying some specimens which proved difficult. Their assistance provided a starting point and was of great value to the project, as was the community support received from a great number of individuals with information that could well have been lost, had not this project been undertaken.

Tweed Shire is surrounded by mountain ranges such as the McPherson to the north and the Tweed to the west, the Knightcap to the south and a low coastal range to the east. Within the Shire lies the Mt Warning caldera which has one of the highest concentrations of rare or threatened rainforest species in Australia. For example, 23 rainforest species are endemic to these border lowlands and adjacent low ranges to 500 metres (McDonald and Elsol, 1984). There are also 200 rainforest species that are at either their northern or southern limit on the Mt Warning shield. In addition, the area has high concentrations of rare or threatened rainforest species; 17 of the 21 endangered species in NSW and 7 of the 10 'not known from any conservation reserve' occur on the lowlands. All of the 23 endangered species occur on the shield; 21 of these are confined to areas below 500 metres (Hunter, 1988).

It became obvious that many roadside remnants contain rare or threatened species as well as individual specimens. The Council has allocated a specific budget for the purpose of locating, tagging and general inspection of trees on the register as well as further additions to the register. Inspections are carried out every six months to ensure that trees are in a healthy state and have not been damaged in any way.

'Significant trees' are also part of the project. These are determined by the Shire's Tree Advisory Committee which is made up of representatives of both the Tweed Shire Council and the public. Members of the public can register trees that are on public land. To be included on the register, a tree must meet one or more of the following criteria. It must:

- have aesthetic value
- be of outstanding age or size
- have historical or cultural value
- make a contribution to the landscape

As each tree is registered it is given a species number and a site number and then given a map grid reference to its location as is the case with rare trees. Regular seed collection from these trees is now carried out at appropriate times of the year. This has become an important part of the programme for propagation and replanting. Many of these trees are used in various Council reserves and parks and in rain forest plantings to ensure their survival and raise public awareness. All this presented a further problem of continuity and to this end a staff training program is well

underway to meet future demands.

Many rainforest species are propagated at the Tweed Shire Council nursery and sold to the public at a nominal fee for reforestation projects or as specimen trees. The low cost benefits the conservation of these species.

It became obvious that a more appropriate filing system would be beneficial to accommodate the wealth of information that was being collected. The decision was made to put this information on a computer system. John Bruggy, System Support Officer for Tweed Shire Council, developed a Dbase IV application to store information on the endangered and significant trees within Tweed Shire. This programme will provide the user with easy access to input, editing, querying and reporting information stored within the database.

All this has had a far-reaching effect on a number of Council's operations; for example, as part of Council procedure for road works, consultation is now required, together with a prior inspection by Recreation Services staff, to ensure that damage to rare or threatened species does not occur. There have been several cases where roadworks have been altered to preserve such specimens.

With approximately 200 trees marked, the amount of time and budget set aside for this project has steadily increased over the past five years. Local awareness of these species has increased through local media sources and Council's public education program and displays of the rare and endangered register at various venues. This was achieved by setting up maps on boards with all significant trees marked, together with explanatory notes and specimens of some of the species in large tubs and pots. This was a help to members of the public as they could check their own roads and localities for rare or threatened species.

Now that the program is computer-based, it is hoped that this will further assist in producing information for schools, interest groups and the general public. No charge is made for such information at the present time but this will depend on future budgetary conditions.

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RARE AND THREATENED FLORA
THE WORK OF THE DEPARTMENT OF PARKS, WILDLIFE AND HERITAGE
TASMANIA

Stephen Harris and Jennie Whinam

The Department of Parks, Wildlife and Heritage has been concerned with the status and security of rare and threatened plants since the appointment of its first plant ecologist in the 1970s. In 1977 Dr MJ Brown and colleagues (Brown et al, 1977) made one of the first attempts in Australia to document the conservation and reservation status of a state flora. This has only recently been updated by a report by Professor Kirkpatrick and colleagues at the University of Tasmania and the Department of Parks, Wildlife and Heritage (Kirkpatrick et al, 1991)

Compilation of this kind cannot be done without accurate vegetation records. In Tasmania's case there is a large body of data resulting from systematic surveys of a broad range of vegetation types. These surveys have been largely carried out under the financial support of National Estate grants administered by the Tasmanian Conservation Trust through Professor Kirkpatrick and also by the Department of Parks Wildlife and Heritage (often as joint projects). Much data has come from other important sources too, such as field naturalist groups, bushwalkers, students, CSIRO and others.

Although we believe we have a good knowledge of what constitutes our rare and threatened flora, the situation is never static. The Department has been closely involved in the maintenance of the national list of rare and threatened plants (eg. Briggs and Leigh, 1988), and has recently revised the State compilation for a national list which is proposed as an attachment to Commonwealth threatened species legislation. The Department is involved in policy at the national level through participation in the ANZECC Endangered Flora Network and also has a representative on the national advisory committee of the Australian Network for Plant Conservation.

In March 1987 Stephen Harris and Jayne Balmer from the Department attended a national conference in Sydney on the conservation of threatened species and their habitats. This was where Norman Myers ("The Sinking Ark") said to forget about rare or endangered species and concentrate on saving the common ones. Such was the rate of species loss, he argued, that we do not have time to worry about the uncommon or threatened ones. We were not so pessimistic however and the federal government followed up one of the major recommendations of the Conference, which was the establishment of an Endangered Species Unit in the Australian National Parks and Wildlife Service.

Within the Department, our statutory responsibility for flora conservation (regardless of land tenure) had been implemented through establishment of state reserves and consolidation of their boundaries. Even in the mid-1970s we were aware of the need to capture a broad range of plant communities within reserves although some of the early proposals for reserves in eastern Tasmania had a long gestation because of land use conflicts.

Plant species are part of a dynamically changing system and long term management for maintenance of biological diversity requires a knowledge of particular plant species making up a

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Please make cheques payable to the Australian Network for Plant Conservation.

*Do you know of anyone who would be interested in becoming a member of the ANPC?
If so, please provide us with their name and address or you may even wish to consider a gift membership!*

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Just over 200 hundred years of European settlement has had a severe impact on Australia's natural ecosystems. The current estimate of extinct plant species in Australia is more than 70, with more than 175 species endangered and another 3200 under some degree of threat.

Fortunately, the community is becoming more conscious of the need to protect global environments from the threats facing them. It is universally recognised that the preservation of habitat is the most desirable means of conserving the biological diversity of all organisms. However, some of these organisms are so threatened that the only means of saving them will be to secure them outside of their natural habitat until suitable places can be located to establish them. Some may have to be maintained permanently in ex situ collections. This complementary role for ex situ conservation is now being referred to as **integrated conservation**.

In March 1991 the Australian National Botanic Gardens (ANBG), with support from the Federal Endangered Species Program, held a conference entitled "*Protective Custody*". The aim of the Conference was to involve organisations and individuals interested in plant conservation and to encourage co-operation between these organisations by the formation of a co-ordinating body for plant conservation. Delegates from Britain, Fiji, New Zealand, Indonesia, the Solomon Islands, the United States of America and Western Samoa also attended the Conference.

During the Conference, consensus was reached that the Australian region does need a body to co-ordinate integrated plant conservation. A proposal for the formation of the Australian Network for Plant Conservation (ANPC) was later produced and widely accepted.

The ANPC draws its membership from throughout Australia (in both public and private sectors) and has a national office at the Australian National Botanic Gardens. It will be the co-ordinating organisation for integrated plant conservation in Australia. It will :

- i) establish a multi-site National Endangered Species Collection for use in the practical recovery of endangered species as well as for research, education, display and general horticulture.
- ii) locate and bring together information on integrated plant conservation activities in Australia and provide access to this information for members.
- iii) assist in the national co-ordination of plant conservation projects to avoid duplication of effort.
- iv) provide advice to members and promote plant conservation activities.
- v) communicate on a regular basis by means of a Newsletter.
- vi) organise workshops, training courses and conferences.

For further information on the ANPC please contact the Curator, Australian National Botanic Gardens, P.O. Box 1777, Canberra ACT 2601.



Eucalyptus risdonii J D Hook.

Drawn by Terry Woolcott, ANPWS

plant community. Any works carried out in reserves are first evaluated for their likely impact on flora and other natural values. Comments are made wherever possible on major developments outside reserves and arguments for minimal environmental impact are always made. When formal management plans are prepared for state reserves prescriptions for management of vegetation and flora are made. Fire management plans also require botanical input to ensure rare or threatened species are not adversely affected by inappropriate management.

Even prior to the establishment of the Endangered Species Unit, the Department applied to its Federal counterpart for funding of a major research project on the conservation biology of a group of species in the Rhamnaceae family which were perceived to be rare or threatened. This particular family was chosen because of the relatively high number of such species in the Tasmanian section of the national list of rare or threatened plants. A series of treatments of such species by family was envisaged and the second such project (perceived rare or threatened plants in the Fabaceae family)

is nearing completion. Recommendations from the first report (Coates, 1991) are being implemented.

By the time the Endangered Species Unit introduced the recovery plan process, the Department was in a position to specify a group of targets for different stages of this process. As a result, funding was secured for the management recovery phase of two recovery plans and the research phase of a third recovery plan. The Department has begun the implementation of the two management plans for *Ranunculus prasinus* and *Carex tasmanica*. This is being carried out with the assistance of the Royal Tasmanian Botanical Gardens. Their involvement in the ex situ aspects of plant recovery was deliberately written into the plans. While in situ conservation is of over-riding priority, it is acknowledged that an ex situ back up programme is sometimes necessary. A statewide strategy for ex situ flora conservation was prepared by the Department and the University of Tasmania (Harris and Gilfedder, 1992) and this will assist in priority setting for the Botanic Gardens.

The Department is not only doing research and actual species recovery, but is exploring legislative mechanisms for protection of rare or threatened species. This is being examined by a ministerially appointed committee chaired by the Assistant Director, Wildlife. The committee includes an education officer who is actively dealing with landowners. The committee is also looking at covenants, financial incentives to landowners, and voluntary schemes. Major threat abatement plans are already being considered for gorse and cats. The Department has specified a further series of species recovery plans and has received funds to prepare them. Broad threatening processes, such as the spread of *Phytophthora cinnamomi* (root-rot fungus) have to be tackled. The Department, with the Forestry Commission, has received Commonwealth funds to evaluate the susceptibility of rare or threatened plants to this fungal pathogen.

The public's attention has been recently captured by publicity on rare or threatened species. This is valuable so long as it can be sustained and put in the context of total habitat protection, although the latter is less glamorous. The aim of this article is not to say that the Department of Parks, Wildlife and Heritage is doing all the work. We are only one of the bodies involved (albeit with a co-ordinating role) in what has to be a multilateral effort. Other organisations such as the Forestry Commission, the University of Tasmania, the CSIRO, the Department of Roads and Transport, Tasmanian Herbarium and non-government organisations such as the Tasmanian Conservation Trust and the Society for Growing Australian Plants are making important contributions.

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TISSUE CULTURE PROPAGATION OF ENDANGERED PHEBALIUM SPECIES

Manfred Jusaitis
Black Hill Flora Centre
Botanic Gardens of Adelaide

South Australia has five species of *Phebalium* (*P. equestre*, *P. brachyphyllum*, *P. lowanense* and *P. glandulosum*) listed as endangered, vulnerable or rare. Two of these, *P. equestre* and *P. hillebrandii* are endemic to the State and have been classified as endangered and rare respectively. The ecology, growth and development of these species have been studied and part of this research has involved the development of propagation techniques. Seed of all five species proved particularly difficult to germinate. Cuttings, on the other hand, produced variable results between species; some (eg *P. hillebrandii*) rooted readily, whilst others (eg *P. lowanense*) proved extremely difficult to root successfully. To improve propagation success, micropropagation

techniques were studied, initially for *P. equestre* and *P. hillebrandii*.

Broad spectrum tissue culture experiments using the deFossard approach indicated that *P. equestre* produced optimal shoot proliferation and growth on HMMH (high minerals, median auxins, median cytokins, high sucrose and other growth factors). Further refinement of this medium showed that 6 μM NOA together with 1 μM BAP were most active. Shoot proliferation in *P. hillebrandii* was optimal on HLMM, with 1 μM NAA and 10 μM BAP producing most activity.

Root initiation in for both species was optimal on LHZL, providing that cultures were transferred to a hormone-free medium (MZZM) after 2 weeks. The auxin with most activity for root initiation was 60 μM 2,4-D. Root production was further enhanced when the initial 2 week incubation was carried out in darkness.

Of the two species, *P. hillebrandii* responded more readily to micropropagation, producing more prolific shoot growth and greater root numbers and length than *P. equestre* under equivalent conditions. Rates of growth and development of *P. hillebrandii* in culture were also greater. Tissue cultured and rooted plantlets of both species were successfully hardened and transplanted to pots under glasshouse conditions.

Similar research is currently in progress using *P. brachyphyllum* and *P. glandulosum*, with early results indicating that at least the former is also readily amenable to micropropagation.

NEWS ITEMS

Alcoa Landcare Portland Seedbank Opens

Alcoa Australia Ltd and Greening Australia Victoria have established a regional seedbank as a co-operative project. It is designed to:

- provide seed of indigenous plants which are adapted to the local climate, soils and pests;
- preserve a diverse gene pool within the local plant species and to store genetic material from rare or threatened plants;
- store seed supplied by groups and individuals who wish to withdraw it at a later date;
- provide advice and large quantities of seed for direct seeding. This includes seed from understorey plants which are sometimes neglected;
- provide a resource centre and education facility for schools, landholders and community groups;
- create an interesting and informative venue for visitors to the region.

The seedbank is housed in the old National School Building at Portland which dates back to 1856 and is listed by the National Trust. Alcoa contributed \$25 000 to the cost of restoration of the building and the balance was met by more than 50 individuals and organisations within the region who contributed materials and labour.

The Alcoa Landcare Portland Regional Seed Bank will offer students and teachers a storehouse

of information and opportunities for hands-on learning.. Display and resource material at the Schoolhouse will tell about regional native plants and their role in the environment, soil types, land management problems and revegetation. There is a lecture theatre equipped with audio visual equipment and a library of audio visual teaching aids.

Visitors to the Portland district who would like to visit the Seedbank are asked to call the Portland Tourist Information Office on (055) 232 671.

(Source: *Quarterly Report, Alcoa Landcare Project, Number 1, May 1992*)

Native Flora and Vegetation Survey of Kalannie-Goodlands Land Conservation District

The West Australian Wildflower Society has been approached by the Kalannie-Goodlands Land Conservation District Committee to provide direction and assistance with a survey of native flora and remnant vegetation in the area. The purpose of the survey is to provide landholders with a detailed knowledge of the native flora that exists in the district, which in turn will enable them to protect the remnant vegetation and develop an expertise in cultivating native flora.

The Society will play a co-ordinating role in the project. This will involve:

- . providing a customised 'Vegetation Survey Package' that can be used for the survey of native vegetation by volunteers under the direction of a botanist;
- . aid with the development of a register of volunteers made up of members of the local community and the Society;
- . employing a team of botanists to carry out the survey;
- . overseeing the preparation of a joint publication on the flora and vegetation of the area.

This project is the first of its type in Western Australia and is expected to lead to many more of a similar nature. A joint application for funding has been made to the Save the Bush Scheme.

(Source: *Wildflower Society of Western Australia Newsletter, vol 30, no. 2, May 1992*)

Research Into Phytophthora

Scientists from the University of Western Australia and Adelaide University's Waite Agricultural Research Institute are attempting to find strains of *Banksia* that have a natural resistance to phytophthora and to develop rapid methods of screening plants for resistance. The project is supported by the Horticultural Research and Development Corporation which provided a grant of about \$40 000 in 1991-92.

The emphasis is on *Banksias* because of their increasing attraction for Japanese and European customers. However the work is expected to apply to a wide range of native flower species. The project is aiming to capitalise on variations within species in their level of tolerance to phytophthora discovered by the Western Australian collaborators, Dr K Sivasthamparam and Dr Kingsley Dixon.

Work has started on three species with the greatest commercial potential as cut flower crops; *B. coccinea*, *B. menziesii* and *B. hookeriana*.

(Source: *Wildlife Society of Western Australia Newsletter, vol 30, no 2, May 1992*)

Plants for Pygmy Possums

The Wangarratta group of the Society for Growing Australian Plants is assisting the Department of Conservation and Environment's project to facilitate the conservation of the mountain Pygmy Possum in the alps of North Eastern Victoria. The mountain habitats of this possum are extremely sensitive to trampling, disturbance and erosion in the resort area, so revegetation of the environment is essential to the creature's survival. To this end, indigenous flora will be grown from seed and cuttings collected from the alpine sites.

The Society will provide 1 000 propagated plants comprised of *Podocarpus lawrencii*, *Tasmannia xerophylla*, *Prostanthera cuneata* and *Olearia phlogopappa*. The Group will be paid for the plants which will be used in the re-vegetation of a specifically designated area in the Mt Hotham Alpine Resort. (Source: SGAP Victorian Region Newsletter, June 1992)

INFORMATION WANTED

Hibiscus insularis: Margaret Christian of the Norfolk Island Botanic Garden would like to know who is growing the Phillip Island hibiscus, *H. insularis*. She would like to know how many plants are in cultivation, either in Australia or overseas, and, if possible, the origin of the plants, (eg cultivated, wild, cutting or seed-grown, etc). Margaret is also keen to obtain seed from as many cultivated plants as possible. Contact her at : Australian National Parks and Wildlife Service, Norfolk Island National Park, PO Box 310, Norfolk Island, South Pacific, 2899, telephone, (0011) 6723 3195, fax, (0011) 6723 3177

NEW PUBLICATIONS

South Australia

Threatened Plant Species of the Murray Mallee, Mount Lofty Ranges and Kangaroo Island Regions of South Australia, by Richard J-P Davies, published by The Conservation Council of South Australia Inc., 120 Wakefield Street Adelaide, SA, 5000, telephone (08) 223 5155, price \$10 plus \$2.65 postage.

Bob Parsons says that this new report is excellent.

New Poster

Australia has about one thousand species of orchids, the majority of which are found nowhere else in the world. Of these, about seventy per cent grow in the ground as terrestrials and the remainder grow on trees (epiphytes) or rocks (lithophytes). Approximately ninety species of Australian orchids have a very restricted distribution and are regarded as being threatened in the wild. This means that they are in danger of extinction if the threats to them continue. At least one species (*Caladenia pumila*) is already believed to be extinct. Threats to orchids include land clearing and degradation, weed invasion, grazing and trampling, chemical spraying, destruction of road verges (a very important habitat resource), urban expansion, poaching and introduced animal pests such as rabbits.

The Australian National Parks and Wildlife Service has produced a poster, *Endangered Orchids of Australia*, that illustrates 18 species of orchids, with descriptions of the threats they face.

The poster is available from the Botanical Bookshop, PO Box 351, Jamison, ACT 2614, (telephone 06-2509541) at a price of \$4 (postage and packing extra). Orders of 10 or more copies are available at a discount from the Education and Public Relations Section, Australian National Parks and Wildlife Service, PO Box 636, Canberra, ACT 2601, (telephone 06-2509556, fax 06-2509528).

Threatened Species Bibliography Published

Late in 1991, the first extensive bibliography of Australian threatened species, both flora and fauna, was published by the Library and the Department of Science on the Rusden Campus of Deakin University, Victoria. Funding for the publication was provided by the Endangered Species Program of the Australian National Parks and Wildlife Service.

The select list contained over 3000 references to 600 species. Around 500 of those references related to plants. Included are books, conference proceedings, journal articles, newspaper reports etc. Plant species covered are included in rare or Threatened Australian Plants (Briggs and Leigh, 1988). The emphasis in what is expected to be the first of many editions, is on fauna because of the wealth of information in that area. The compilers, biologist Rob Wallis and librarian Kevi Slattery, have focussed more on threatened plants as they prepare a supplement to the list due for publication in January, 1993.

The bibliography is available in both print format (\$23 including postage) or on floppy disc (\$25 in ASCII format or \$65 as a data base for those possessing INMAGIC software. The publishers are also willing to provide an up to date version on disk of the list (as at 22nd July, 1992) in ASCII format for the special price of \$35. This update contains a further 280 references to threatened flora.

Enquiries re purchase of the printed or disk version of the list may be directed to Mr Michael Holmes, Department of Science, Deakin University, 662 Blackburn Road, Clayton North, Vic., 3168.

The compilers welcome feedback and will be grateful for suggestions relating to omissions, coverage or any other matter relating to the bibliography.

MEMBERSHIP LIST

A copy of the latest list of ANPC members is attached. Addresses and names of contact persons are available from the National Office.

Adelaide, Botanic Gardens of; South Australia
Alcoa of Australia Ltd.; Western Australia
APPM Forest Products; Tasmania
Arid Land Botanic Garden, South Australia
Association of Societies for Growing Australian Plants
Australian Association of Bush Regenerators
Australian Forestry Council, Tasmania
Australian Mining Industry Council, Australian Capital Territory

Australian National Botanic Gardens, Australian Capital Territory
 Australian Tree Seed Centre, CSIRO, Australian Capital Territory
 Berwick, City of; Victoria
 Boden, Dr Robert; Australian Capital Territory
 Botanic Gardens Conservation International; United Kingdom
 Botanical Preservation Corps ; United States of America
 Briggs, Dr Barbara; New South Wales
 Brown, Dr AHD; Australian Capital Territory
 Brown, Mr Ray; New South Wales
 Brunswick Valley Heritage Park, New South Wales
 Buddee, Miss Dulcie; New South Wales
 Burke, Ms C; Queensland
 Burns, Mr R; Tasmania
 Burrendong Arboretum Trust; New South Wales
 Burrows, Dr G; New South Wales
 Center for Plant Conservation; United States of America
 Champion, Irene; Queensland
 City of Ballarat, Vic
 Coates, Anne; Western Australia
 Coffs Harbour City Council; New South Wales
 CSIRO, Division of Plant Industry; Australian Capital Territory
 Conservation Commission of the Northern Territory
 Donaldson, Mr S; Australian Capital Territory
 Dulegal Arboretum; New South Wales
 Elliot, Rodger; Victoria
 Eurobodalla Botanic Gardens, New South Wales
 Friends of the North Coast Regional Botanic Garden; New South Wales
 Friends of the Points; Victoria
 Flecker Botanic Gardens; Queensland
 George, Mrs E; Western Australia
 George Caley Botanic Garden; New South Wales
 Gilfedder, Ms. L; Tasmania
 Gladstone Tondoon Botanic Gardens; Queensland
 Good, Roger; New South Wales
 Gordon, Mr David; Queensland
 Gorst, Dr Janet; Tasmania
 Green, Joanne; New South Wales
 Greening Australia (ACT)
 Greening Australia (NSW)
 Greening Australia (Vic)
 Greening Australia (WA)
 Hadlow, Mr Barrie; ACT
 Heisler, Mrs. Jan; New South Wales
 Honiara Botanic Gardens; Solomon Islands
 Hoult, Mr. Mark; Northern Territory
 Hunter Region Botanic Gardens; New South Wales
 Kingfern Natives; New South Wales
 Kings Park and Botanic Gardens; Western Australia

Limpinwood Gardens Nursery, New South Wales
McDonald, Mr. WJF; Queensland
Mason, Mr. David; New South Wales
Mt Coot-tha Botanical Gardens; Queensland
Olive Pink Flora Reserve; Northern Territory
Parsons, Dr. Bob; Victoria
Robinson, Mr. Brett; New South Wales
Royal Australian Institute of Parks and Recreation, ACT
Royal Botanic Gardens, Sydney; New South Wales
Royal Botanic Gardens, Melbourne; Victoria
Royal Tasmanian Botanical Gardens; Tasmania
Rusden Campus Library, Deakin University, Victoria
Salkin, Mrs Esma; Victoria
Sankowsky, Mr Garry; Queensland
Sell, Mr. Lindsay; New South Wales
Stony Range Flora Reserve, New South Wales
SGAP - Canberra Region Inc
SGAP - Dryandra Study Group
SGAP - East Hills ; New South Wales
SGAP - Grampians Group; Victoria
SGAP - New South Wales Ltd.
SGAP - New England; New South Wales
SGAP - Newcastle; New South Wales
SGAP - North Coast; New South Wales
SGAP - North Shore; New South Wales
SGAP - North West; Tasmania
SGAP - Redlands; Queensland
SGAP - South Australia Region
SGAP - South West Slopes; New South Wales
SGAP - Tasmania Region
Suva Botanical Gardens; Fiji
Tarran, Dr. J; New South Wales
Threatened Species Network (NT), Northern Territory
Townsville Botanic Gardens; Queensland
Tumut Ecology Reserve Trust; New South Wales
Vailima Botanic Gardens; Western Samoa
The Waite Arboretum, South Australia
Ward, Mr. Chris; New South Wales
Wildflower Society of Western Australia - Armadale
Wildflower Society of Western Australia - Mandurah
Wrigley, Mr. John; New South Wales
WorldWide Fund for Nature Australia
Zoological Board of Victoria

If you would like more information about the Australian Network for Plant Conservation, please write to The Curator, Australian National Botanic Gardens, PO Box 1777, Canberra, ACT, 2601

