

Native plants at risk

by Andrew Bell



Trade in banksias is mainly confined to common Western Australian species such as *Banksia coccinea* (left) and *B. grandis* (above).

Understandably, more public concern has been given to the plight of our native animals than to this country's plants. Yet a recent study lists more than 2000 Australian plant species as actually or potentially at risk. This figure — derived by Mr William Hartley and Dr John Leigh, of the CSIRO Division of Plant Industry — is equivalent to about 10% of the total known indigenous flora.

Australia's flora is an asset of incomparable diversity and richness. It includes perhaps 20 000 species of plants, more than 85% of which are endemic species — that is, found only in this continent. A number of plants represent groups that have been disappearing from other continents, and some relatives of crop plants may be used in the search for disease-resisting genes. The primitiveness of much of the Australian flora suggests that this country may well have been a centre of origin of the flowering plants.

Although more than 200 years have passed since Sir Joseph Banks began collecting plant specimens here, a great deal remains to be discovered about our plants. For instance, it has been estimated that 1000–3000 species of the flowering plants in Western Australia remain undescribed.

Because changes in land use are rapidly modifying the distribution and abundance of our flora, the need to develop a strategy for the protection of endangered flora is now being better appreciated. In 1975 the Council of Nature Conservation Ministers (CONCOM) established a



Dendrobium bigibbum, Queensland's floral emblem, is one of the most beautiful Australian orchids. Digging up the plant from the wild for commercial gain has significantly reduced its abundance.

working group specifically to advise on the conservation of endangered plant species.

Mr Hartley and Dr Leigh, who are members of the working group, were asked to prepare a list of such species, and the outcome is 'Plants at Risk in Australia', a booklet recently published by the Australian National Parks and Wildlife Service.

In all, 24 species are at great risk mainly as a result of commercial pressures.

Their starting point was a list of plant species considered rare or endangered, which was first published in 1974 as part of the International Biological Programme. This 'Specht Report' was an aggregation of lists compiled by each State Herbarium and placed 3026 species in one or more of six conservation or distribution categories.

Unfortunately, the value of the Specht list was limited because of different criteria used by different States. For example, Victoria and Tasmania listed all species found exclusively in their State, irrespective of whether or not they are rare. In the Western Australian list, species known only from the original collections predominated. This mainly reflects a lack of further collecting effort rather than indicating the rarity of the species.

Further, many of the species listed, while rare in one State, are relatively common elsewhere and hence cannot be regarded as at risk in Australia as a whole. Finally, many new species have been described since the Specht report was published, and additional information is available about those previously listed.

After Mr Hartley and Dr Leigh looked into these details, 2128 species previously listed were deleted and a further 1156 were added, making a total of 2053 species now considered to be at risk.



Hibbertia miniata is an extremely rare Western Australian plant. The main danger comes from collection by amateur horticulturists.

The researchers developed a new 'risk coding', in which the distribution of a species is categorized from 1 to 5 and the conservation status is indicated by one of five letters.

The distribution categories increase progressively in size from single localities (category 1) to large areas (categories 4 and 5). Those species known only in a single locality are obviously at serious risk, although lack of knowledge of a plant's distribution and even its taxonomic identity can complicate matters. Species categorized as restricted endemics (2) or rare (3) are potentially at risk through fire, drought, grazing, land clearing, and other factors.

The conservation categories range from extinct (X), through endangered (E), and vulnerable (V), to those plants not conserved in reserves (n), and finally those so conserved (C).

The greatest numbers of plants at risk occur in the south-western corner of Western Australia (820 species) and in the Cape York region of Queensland (159); this reflects partly the richness of these areas in species found only there, and partly the fact that some species centred in the Indo-Malaysian region occur occasionally in Cape York. Rainforest and mountainous or broken country, with their varied and often extreme habitats, were also found to contain many plants at risk.

Turning to conservation status, nine species are believed to be extinct as they have not been collected in recent years. A total of 221 species (11% of those listed) are regarded as endangered — 75 or one-third of which occur in the south-west of Western Australia. Species considered to be vulnerable number 544, giving a total of 774 for those Australian plants considered to be at serious risk.

Some existing reserves are too small to allow a plant community to be self-perpetuating.

A price on their head

In addition to the risk-coding scheme detailed above, Mr Hartley and Dr Leigh have taken a special interest in finding out which species are subject to heavy commercial exploitation in the wild state. In the coding system used, an asterisk is added against those species unlucky enough to be specially attractive to florists, seed-collectors, and nurserymen. Banksias, kangaroo paws, boronias, and ferns are some of the ones most in demand. Many banksias command high prices for centre pieces of flower arrangements, and their trade extends overseas by air freight. Other native flowers are valued for dried arrangements.

Of the commercially exploited species, 34 have a very restricted distribution: 11 of these are considered endangered and one vulnerable. All the endangered ones are from the south-west of Western Australia; the vulnerable one is from Cape York.



Byblis gigantea is an insect-eating plant from Western Australia. The whole plant is collected by carnivorous-plant enthusiasts and it is often sent overseas.

In all, 24 species (13 endangered plus 11 vulnerable) are at great risk mainly as a result of commercial pressures. Moves have been made to protect these species on State, national, and international levels.

In a significant step, all of our species threatened by international trade have now been protected under the Convention on International Trade in Endangered

Species of Wild Fauna and Flora. Under the Convention, trade in a listed species is banned except where certain export and import permits are signed. Australia became a party to the Convention in 1976 when the regulations were concerned mostly with fauna (see *Ecos* 5, 'International trade, and conserving our wildlife'). Membership of the Convention has now grown to 50 countries.

When Australia submitted its proposals — to protect more than 60 plant species — to the Convention at their last meeting in Costa Rica in March this year, all were accepted. One species — a fern — was withdrawn from the list pending further study on the extent of its trade, particularly its use in ground-up form as a potting medium.



Trade in the kangaroo paw, *Anigozanthos manglesii*, the floral emblem of Western Australia, is estimated at 200 000 bunches a year.



Featherflowers are extensively picked for fresh cut flowers. Some species are rare and this one, *Verticordia grandis*, is among the rarest.

Indeed, the Convention now covers 988 plant species; some are not endangered, or even traded, but the list encompasses species likely to be confused by customs officers with an endangered one. (It includes all orchids, for example, even though not all are threatened by trade.)

An estimated 1000–3000 species of the flowering plants in Western Australia remain undescribed.

National parks

Creating national parks or special reserves has also proved valuable in protecting our endangered plants. In Victoria, for example, 60–70% of the State's plant communities can be found in its national parks and reserves. Not only flora, but most fauna would also be conserved if a wide enough network of reserves was set up.

It must be recognized, however, that some existing reserves are too small to allow a plant community to be self-perpetuating. Others contain inadequate buffering zones, being 'islands' of the original landscape surrounded by urban, rural, or forestry development. The plant population cannot expand, and these reserves will suffer invasion from adjacent ecosystems modified by Man. Water table changes resulting from irrigation or drainage can have far-reaching effects on small reserves, too.

Furthermore, fertilizer-rich dust and debris from adjacent farmland, even that from road-making, can have a deleterious effect on the nutrient-deficient soils of coastal eastern and southern Australia. Yet these ecosystems contain many of Australia's most spectacular wildflowers, well adapted to their meagre soils. Even fruit peelings, cigarette butts, and papers dropped along tracks and roadsides can inadvertently contribute an excess of nutrients.

The number of plants at risk in each State

	families	genera	species
W.A.	62	233	936
N.T.	45	85	108
S.A.	52	119	249
Qld	68	187	311
N.S.W.	64	160	305
Vic.	39	83	136
Tas.	45	85	138
Australia	141	596	2053

More than 2000 species are actually or potentially at risk, a figure equivalent to about 10% of the Australian native flora. About 45% of the species at risk are from Western Australia.

Such disturbed ecosystems seem to become more susceptible to *Phytophthora cinnamomi*, the virulent soil pathogen that has recently caused catastrophic deaths to native species in many areas.

In general, few plant communities are really adequately conserved anywhere. More than one reserve may be essential to cover the genetic and structural diversity contained in a wide-ranging species. But the most obvious gaps are, not surprisingly, in the areas subject to the greatest demand for other uses — grazing land, for example. In more than 600 000 sq km of tussock grassland, less than 10% of plant communities are adequately conserved, and only one of 54 low shrubland ecosystems is in that category.

Fragile plants

Further risk is posed by the now easier access into previously inaccessible areas such as mountain regions, which are now used for recreation. This has increased pressures on fragile plant communities (see the article on page 24).

Paradoxically, the enthusiasm of conservationists themselves can pose a threat to our plants. The release of detailed site locations for populations of rare species can bring hordes of botanists, photographers, and plant enthusiasts, trampling and removing protective ground covers.

As early as 1837, the yellow lady slipper orchid was becoming scarce in Britain, being reported to 'suffer so much from the rapacity of the curious, etc., who no sooner ascertain the place where it grows, than immediately they extract the roots from the soil, either with a view to profit, or to plant them in their flower-garden for the purpose of augmenting its riches...'. Today, the same species is known only at a single site in the north of England.

In Australia, the main threat to an extremely rare Western Australian plant, *Hibbertia miniata*, comes from collection by amateur horticulturists. And in New Zealand over-zealous collecting probably contributed to the likely extinction of a native mistletoe. As rarity increases, so do the attentions of well-meaning botanists, and one New Zealand scientist reports that herbaria are full of specimens of reputedly local and rare plant species often collected repeatedly from the same localities. He also quotes other workers, who, when referring to rare plants of the Auckland District, state: 'we make no apology for keeping silent as to the last retreats of very rare species'.



The Qualup bell, *Pimelea physodes*, is a rare Western Australian plant extensively traded, locally and overseas.

New Zealanders take the preservation of their plants seriously, and when a plant species is greatly depleted they resort to 'enrichment'. Seeds, cuttings, and tubers are taken from wild plants, propagated, and the seedlings planted back with the parents. Thus, at Castle Hill reserve in Canterbury, the only known site for a *Ranunculus* species, division of plants and scattering of seed has increased the population from 14 plants in the 1940s to several hundred now.

Australians haven't yet practised enrichment, but a number of botanical gardens are becoming aware that they may soon need to.

The publication of a list of Australian plants at risk is, it is hoped, a major step in preserving our plants from extinction. The list is conveniently stored on a computer file to allow rapid updating and availability to interested persons. Dr Leigh recognizes that the list is far from final and seeks suggestions and amendments, which should be sent to him at the CSIRO Division of Plant Industry, P.O. Box 1600, Canberra City, A.C.T. 2601. In this way the list will become of increased value to those whose task is the wise management of our plant heritage.

More about the topic

'Plants at Risk in Australia.' William Hartley and John Leigh. (Australian National Parks and Wildlife Service: Canberra 1979.)

Conservation of major plant communities in Australia and Papua New Guinea. R. L. Specht, Ethel M. Roe, and Valerie H. Boughton. *Australian Journal of Botany*, 1974, Supplementary Series, Supplement No. 7.

'Australian Flora and the Endangered Species Convention — CITES.' John Leigh and Robert Boden. (Australian National Parks and Wildlife Service: Canberra, in press.)

International trade, and conserving our wildlife. *Ecos* No. 5, 1975, 26–8.