

## AUSTRALIAN ENDANGERED SPECIES

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It is now 200 years since the first white settlement in Australia and in recent years we have been taking stock of our natural resources, and starting to wonder what will be left for the next two hundred years.

The Australian landscape has been radically altered over the years, and now in many regions there is very little surviving of the original vegetation. Some of the major events which have affected the environment include the establishment of the sheep industry, massive development in wheat farming, economic depressions, drought, and the introduction of the rabbit (1). More recent events include harvesting forests for wood chips, strip mining, and the destruction of rainforests.

Since the mid-1970's Botanic Gardens have become aware of the need to be involved in the conservation of species. The International Union for Conservation of Natural Resources was responsible for early initiatives in this area producing the red data books, which list rare, vulnerable, and endangered species.

In Australia there are now 3317 species listed on the rare or threatened list (2) this is made up of:

222 Endangered species

853 Vulnerable species

1371 Rare species

811 Poorly known species now suspected of being threatened

There are also 131 species that are presumed to have become extinct in the wild.

The Australian National Botanic Gardens has concentrated its main effort on conserving those species in the Endangered category. These are the species at the highest risk and are likely to become extinct during the next 1 to 2 decades (1). The aim is to maintain viable collections of Endangered species and to do this we attempt to grow 5 clones of each species. Where there is more than one population of a species an attempt is made to grow 5 clones from each population. To ensure that individual clones are not lost, at least 3 replicates of each clone are grown.

The collection and cultivation of Endangered species is expensive as it requires considerable time and effort and our funding for field work is limited. As a result efforts so far have been confined to those species that are in the southeastern part of Australia.

Some of the species worked on over the past 2 years are:—

(1). *Acacia pubescens* (Vent.) R. Br., a bushy shrub 1 to 3 meters high, formerly known to occur in small populations to the west of

Sydney and in the lower Blue Mountains. Many of its original sites are now covered by houses—a freeway was recently built through what was thought to be one of the last stands of this species. Our field work however, has shown that this species still occurs in at least two other areas with over 1000 plants in each area. This species has soft blue-green leaves and is a most attractive garden plant.

**Propagation:** It is easily propagated from seed treated with boiling water. Seed is not always available, as seed set may be erratic. It can also be propagated from cuttings using 4000 ppm IBA as a liquid dip. As this species often suckers profusely it is possible that division could also be used as a propagation method.

(2). *Grevillea iaspicula* McGillivray is a spreading rounded shrub 1.5 to 3 m high with red and white pendulous flowers. This species was initially known to consist of 15 plants confined to three small limestone outcrops in the Wee Jasper area of southern NSW. Further searches have located two other populations containing nearly 500 plants. In all cases the species is confined to limestone soils.

Despite doing best on alkaline soils, plants adapt readily to a range of soil types. With some light pruning this species performs well and is useful for attracting honeyeating birds to the garden.

**Propagation:** It is readily grown from cuttings taken in late summer and autumn. 2000 ppm IBA applied as a liquid dip gives excellent results.

(3) *Haloragodendron lucasii* (Maid. & Betche) Orchard. This small shrub was thought to be extinct, as it had not been seen for nearly 60 years. A chance find located a small population of 200 plants growing on sandstone in the Ku-ring-gai area near Sydney. This species is of limited horticultural appeal and is likely to be grown only by native plant enthusiasts.

**Propagation:** Plants of this species have been observed to layer naturally. It is also very easy to strike from cuttings.

(4). *Phyllota humifusa* A. Cunn. ex Benth, is a prostrate shrub 15 cm high by 2 m across with orange/red pea shaped flowers. While this species is common at the two known localities it may never have been very widespread. It occurs on deep yellow sands in the Penrose-Mittagong area 100 km from Sydney. This attractive species has the potential to be a very useful ground cover.

**Propagation:** It can be grown from cuttings using 500/500 ppm IBA/NAA as a liquid dip. It is expected that seed would also germinate readily, but to date no seed collections have been made.

(5) *Pimelia spicata* R. Br. is a small spreading shrub to 50 cm high with white flowers. Although formerly quite widespread, it now appears to be very restricted, with only two small populations at Narellan and Shellharbour. There are approximately 200 plants in one location, 15 in the other. Interestingly, these two habitats



differ markedly in soil and vegetation types and distance from the sea. This species thrives in cultivation and performs well as a pot plant. It has a persistent carrot-like tap root which is unusual for this genus.

*Propagation:* It can be grown from cuttings using 500/500 ppm IBA/NAA as a liquid dip.

(6). *Pomaderris brunnea* Wakefield, is an erect shrub to 3 m tall that occurs in the Picton area. The small known populations were thought to be endangered by mining operations but further searches have found over 700 plants growing in a sanctuary. As with many species of *Pomaderris*, *P. brunnea* is of limited horticultural appeal.

*Propagation:* This is a very difficult species to grow from cuttings. Our best results have been a 5% strike using 500/500 ppm IBA/NAA as a liquid dip. Propagation from seed has not yet been attempted.

(7) *Prostanthera stricta* R. T. Bak., is a bushy shrub 1 to 2 m high with mauve/violet flowers. Previously only known from one locality at Ilford and last collected in the early 1950's, this species has been relocated at Ilford in reasonable quantities. It grows mainly along the edge of cliff lines in this area. This desirable species, along with most of the *Prostanthera* genus, is susceptible to root rot and requires well drained soil or grafting onto resistant rootstocks for best results.

*Propagation:* It grows very easily from cuttings using 1000/300 ppm IBA/NAA as a liquid dip.

(8). *Swainsona recta* A. T. Lee is a small perennial herb that grows from 15 to 30 cm high and has very attractive purple pea-shaped flowers. Two widespread populations of this species were previously known, one in Canberra (5 plants) and the other at Wellington (approx. 50 plants). A further 200 plants have since been found growing along a railway line close to Canberra. It is rather wispy and inconspicuous when not in flower and may die back to a perennial rootstock during winter. Slugs and snails find this species very palatable in the nursery and grazing by livestock is thought to be the main reason for decline in the wild.

*Propagation:* It grows well from seed but is difficult to maintain in cultivation.

(9). *Syzygium paniculatum* Gaertn., is a medium tree to 15 to 20 m with ornamental magenta coloured fruit. Although it is frequently seen in the nursery trade it is quite rare in the wild. A number of small populations are known, one near Kurnell (20 trees) and the other at Jervis Bay (14 trees). This species is quite fast growing in mild climates and looks quite attractive when in fruit.

*Propagation:* It can be grown from either seed or cuttings. Seed should be sown soon after harvest for best results. Insect larvae often cause severe damage in wild collected seed.

While not all threatened species are horticultural subjects it is hoped that all can be saved from extinction. Some difficult-to-grow species may only be conserved in their natural habitats, others can be easily maintained in cultivation.

It is important that every effort be made to save these plants as most have not been assessed for their potential. Some may be important sources of pharmaceuticals. Others closely related to crop plants may be useful for breeding purposes. Once gone, however, they cannot be replaced.

## REFERENCES

1. Leigh, J., R. Boden, J. Briggs, 1984. *Extinct and Endangered plants of Australia*. Macmillan.
2. Briggs, J. and J. Leigh, ROTAP (unpublished).

## **INTEGRATED PEST MANAGEMENT WITH REFERENCE TO PLANT PROPAGATION**

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## INTRODUCTION

Since the large scale production of synthetic pesticides following World War II, the most common approach to pest control in agriculture and horticulture has been prophylactic application of chemicals, based on potential insect and disease threats. Recent increased awareness of the limitations and side effects of pesticides is causing this attitude to be rethought. Problems associated with pesticide use include widespread resistance in insect and mite pests and pathogens, elevation of organisms to pest status through elimination of natural suppressive agents, major environmental damage from some pesticides, and human health and safety concerns (in particular mutagenic effects of pesticides). With a number of crop plants, phytotoxic injury from pesticides is a major problem, and there is evidence that regular pesticide use may suppress plant growth (15). In addition, while the presence of pests constitutes barriers to international trade, so do unacceptable levels of pesticide residues.

The rate at which new pesticides are being developed is not able to keep pace with their removal from the market place. Two recent Australian examples are the withdrawal of the fungicide Captan, and the miticide Cyhexatin. Pesticide companies realize that a more