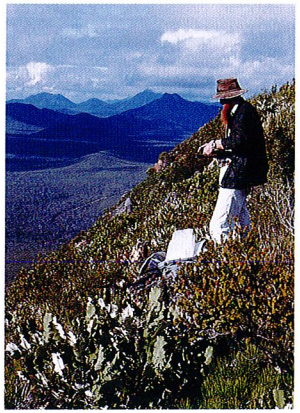
Helping to conserve Western Australia's unique flora

South West Western Australia is one of the world's top 25 biodiversity hotspots. The area contains the highest concentration of rare and threatened plants in Australia with an estimated 75 per cent endemism. In Western Australia, more than 350 plant species are listed as Declared Rare Flora with a further 2,000 species considered rare or poorly known. This diversity of species is exceptional from a global perspective.



On the brink of extinction

One of the most serious environmental problems facing South West Western Australia is loss of biological diversity.

Many of the major threats to the flora have been caused by extensive clearing and associated degradation of vegetation over the past 200 years. The spread of the introduced pathogen, *Phytophthora cinnamomi*, commonly called dieback disease, is now considered a biological disaster of global significance given the richness and high degree of endemism of the flora.

Past land clearing and habitat fragmentation have subjected large areas of Western Australia to rising ground water levels and salinisation. Alien weeds and pests further threaten ecosystem stability. The long term impact of climate change may also affect species with narrow environmental tolerances.

The rapid decline in population size due to habitat destruction and the isolation of many rare plants may render them susceptible to extinction when sudden unexpected changes occur in the landscape. Loss of genetic diversity and inbreeding in these small populations are significant threats to both short and long term survival.

Conserving genetic diversity

These threats may not necessarily lead to immediate species extinction but will inevitably result in loss of genetic variation. Species survival and evolutionary processes rely on the maintenance of this variation. In the wild, genetic variation enables plants to adapt to changing environmental and ecological conditions, as well as providing resistance to pests and diseases. Off site seed conservation facilities, or seed banks, can be used as an interim solution to prevent the loss of genetic diversity or extinction of a species. The capture of a sufficiently broad samples of genetic variation is essential if the stored material is to be effectively used in the long term re-establishment of the species in the wild following removal of the threats.

Seeds for the future

One of the most cost effective methods for seed conservation is the long term storage of dry seed at low temperatures in a seed bank. The highly compact nature of seed makes them ideal for storage. Their portable nature allows for duplication of collections for safe keeping in other seed banks. In addition, low temperature seed storage is more economical than maintaining collections of living plants in botanic gardens.

In 1992 the Western Australian Government established the Threatened Flora Seed Centre with the aim of developing a comprehensive seed-based collection of Western Australian flora. This included the maintenance of an integrated database on seed provenance and seed biology for each collection. The Centre focuses on species and ecological communities threatened by habitat destruction through disease and changed hydrology, weed invasion and low population size, and plays a major role in the conservation of flora in Western Australia.

An integrated strategy

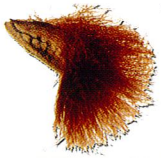
Despite the importance of seed banks, the long term storage of genetic material is not an alternative to conservation in the wild. The protection of populations in their natural habitat is the most important flora objective. Seed banking is a conservation activity that provides critical assistance to the survival of plants in the wild because it offers material for recovery programs and scientific research.

Seed banking activities can contribute to the rapidly developing knowledge of the biota, providing a way to investigate the reproductive biology of Western Australia's native flora.

In addition, material is available for education, display and scientific investigation into the susceptibility of flora to introduced pathogens and the effects of salinisation and waterlogging.

Most importantly, seed banking activities provide the raw material for species recovery.

As such, seed banking is a complementary approach to on site conservation and provides an insurance to counter unpredictable events.



Threatened Flora Seed Centre
Western Australian Herbarium
Department of Conservation and Land Management
Locked Bag 104
Bentley Delivery Centre
Western Australia 6983
http://www.calm.wa.gov.au/

In partnership with the Millennium Seed Bank Project, Royal Botanic Gardens, Kew, United Kingdom
http://www.rbgkew.org.uk/msbp/

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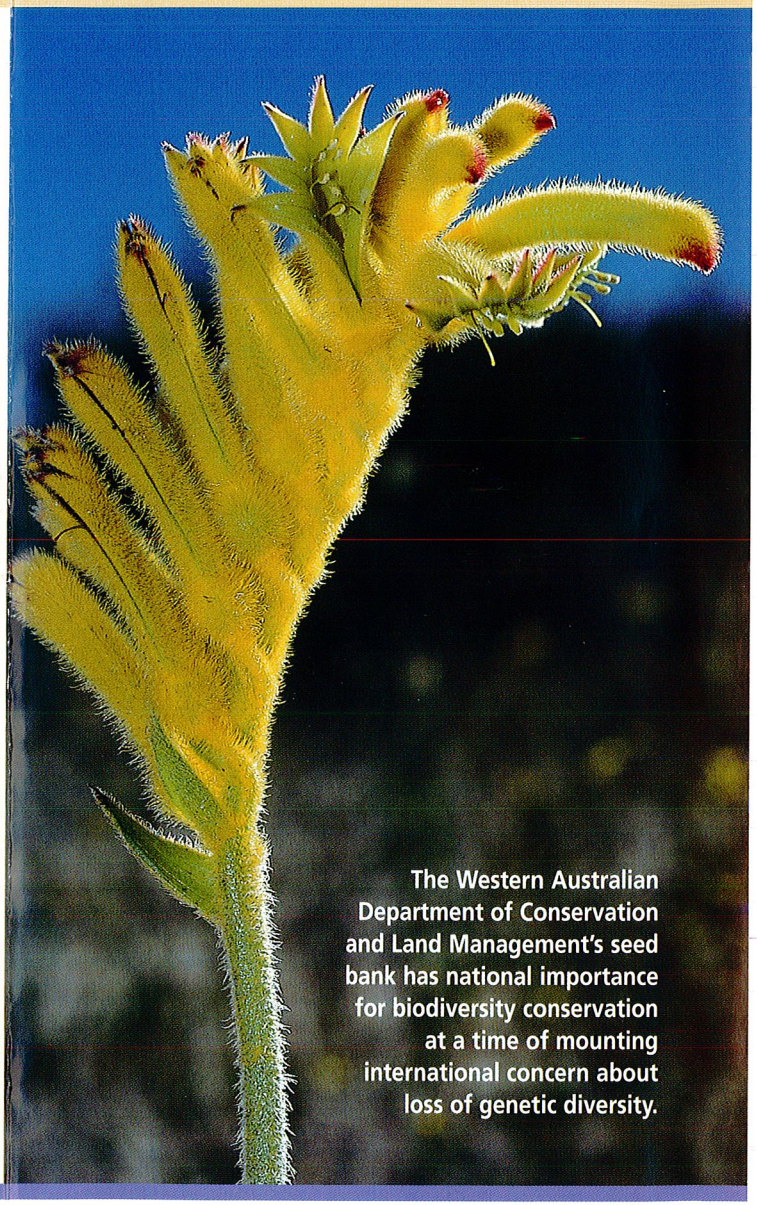
Threatened Flora Seed Centre



The Western Australian Department of Conservation and Land Management's seed bank has national importance for biodiversity conservation at a time of mounting international concern about loss of genetic diversity.