



A unique voyage for threatened plants

Research supported by an international partnership has resulted in seeds of the feather-leaved banksia making a special voyage to the United Kingdom before returning home to Western Australia as seedlings for planting that will enhance the survival of the species in the wild.

by Anne Cochrane

The feather-leaved banksia (*Banksia brownii*) is an iconic plant species from the south-west of Western Australia. It is listed as critically endangered and is declining due to the effects of *Phytophthora* dieback and too-frequent fires. It is highly possible that a changing climate may also affect the survival of this species. With this in mind, seeds of the feather-leaved banksia were collected from both coastal and mountain populations and, along with seeds of other species, taken to England in April 2007 for safekeeping under WA's partnership with the Millennium Seed Bank (MSB) Project at the Royal Botanic Gardens in Kew (see 'Our frozen future', *LANDSCOPE*, Winter 2001).

In collaboration with MSB Seed Ecologist Matthew Daws, experiments were established that aimed to understand temperature limitations on germination and growth of the banksia seed. Laboratory and glasshouse trials formed part of the preliminary experiments. Some interesting findings were made, but the most important point was the number of plants produced



from the experiments. Traditionally, the germinated seeds would be recorded and the seedlings thrown away, but because of the threatened nature of the feather-leaved banksia it was considered wise to keep the seedlings and bring them home to be used in planned reintroductions this year.

Bringing the seedlings home

Stringent restrictions on the import of plant material into Australia meant a permit from the Australian Quarantine Inspection Service was required to bring the plant material back into Australia, despite the material being of Australian origin. To assure the Australian authorities that the plant material did not carry any 'foreign' pathogens, a phyto-sanitary health certificate was obtained from the British Government before re-entry into Australia. Although the Royal Botanic Gardens is a quarantine station, obtaining a health certificate for the seedlings was a precautionary measure. Due to international airline regulations for restricting liquids and gels to 100 millilitres, the seven small containers of seedlings growing in nutrient-free agar gel were not permitted on the plane as carry-on baggage. The seedlings were therefore required to travel in the hold of the plane. Though carefully packed in a small insulated esky made of polystyrene foam and wrapped well in plastic, there was some doubt as to whether the seedlings would return to Australia alive and in good enough shape to survive.

On landing in WA, the seedlings were taken to the Kings Park nursery in Perth for nurturing before they were large enough for planting back into the wild. Seedling survival was very high despite their long trip in the unpressurised hold of an aircraft. Of the original 165 feather-leaved banksia seedlings put on the plane in June 2007 in the United Kingdom, 86 of the mountain form and 70 of the

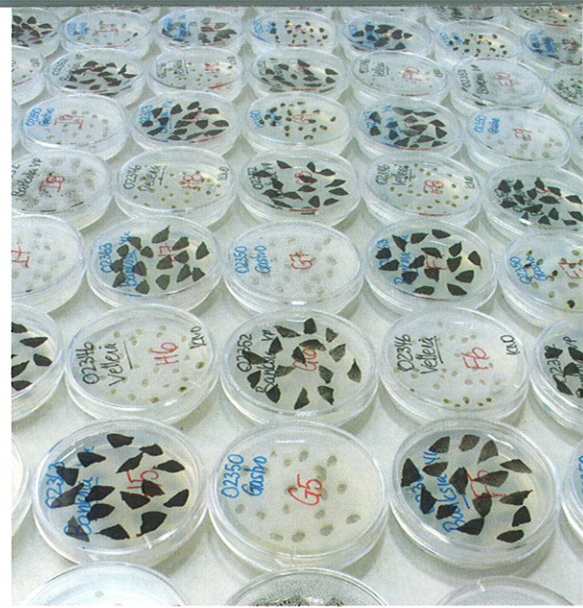
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Main Feather-leaved banksia seedlings growing in the glasshouse at the Millennium Seed Bank in England.
Photo - Anne Cochrane

Above Anne Cochrane with feather-leaved banksia seedlings for planting in a 'seed orchard' near the Stirling Range.
Photo - Sarah Barrett

Left The feather-leaved banksia growing in the wild.
Photo - Renee Hartley





coastal form survived until planting in May 2008. Meanwhile, since the initial arrival of the seedlings back 'home', Department of Environment and Conservation scientists had located two possible disease-free planting sites through the Western Australian Government's *Saving Our Species* initiative and through additional support from the Commonwealth-funded South Coast Natural Resource Management group. Plantings started in May this year and detailed demographic monitoring of the plants will be carried out to determine survival over time—information that is a vital part of any plant reintroduction.

World first in flora conservation

This has been the first attempt to repatriate whole plant material from the MSB back to its country of origin, marking a stepping stone in the

global seed conservation partnership. Examples like this mean that research aimed at overcoming barriers to germination or understanding threats can be conducted on material held in the UK seed bank and the resultant seedlings can be sent back to the country of origin for reintroduction back into the wild. Many of the partner countries in the MSB collaboration do not have the capacity to conduct detailed research themselves so carrying out research in the UK is a feasible option. When threatened plants are involved it is comforting to know that seedlings from research programs can relatively easily return home. For the feather-leaved banksia, the increase in plants on the ground and knowledge of threatening processes associated with plant decline will increase the chances of the species' future survival.

Above left Feather-leaved banksia flower.
Photo – Renee Hartley

Top Feather-leaved banksia seeds from the Stirling Range species are assessed for temperature requirements for germination at the Millennium Seed Bank.
Photo – Anne Cochrane

Above Anne Cochrane plants a feather-leaved banksia seedling into a reintroduction site near Albany.
Photo – Meredith Spencer

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