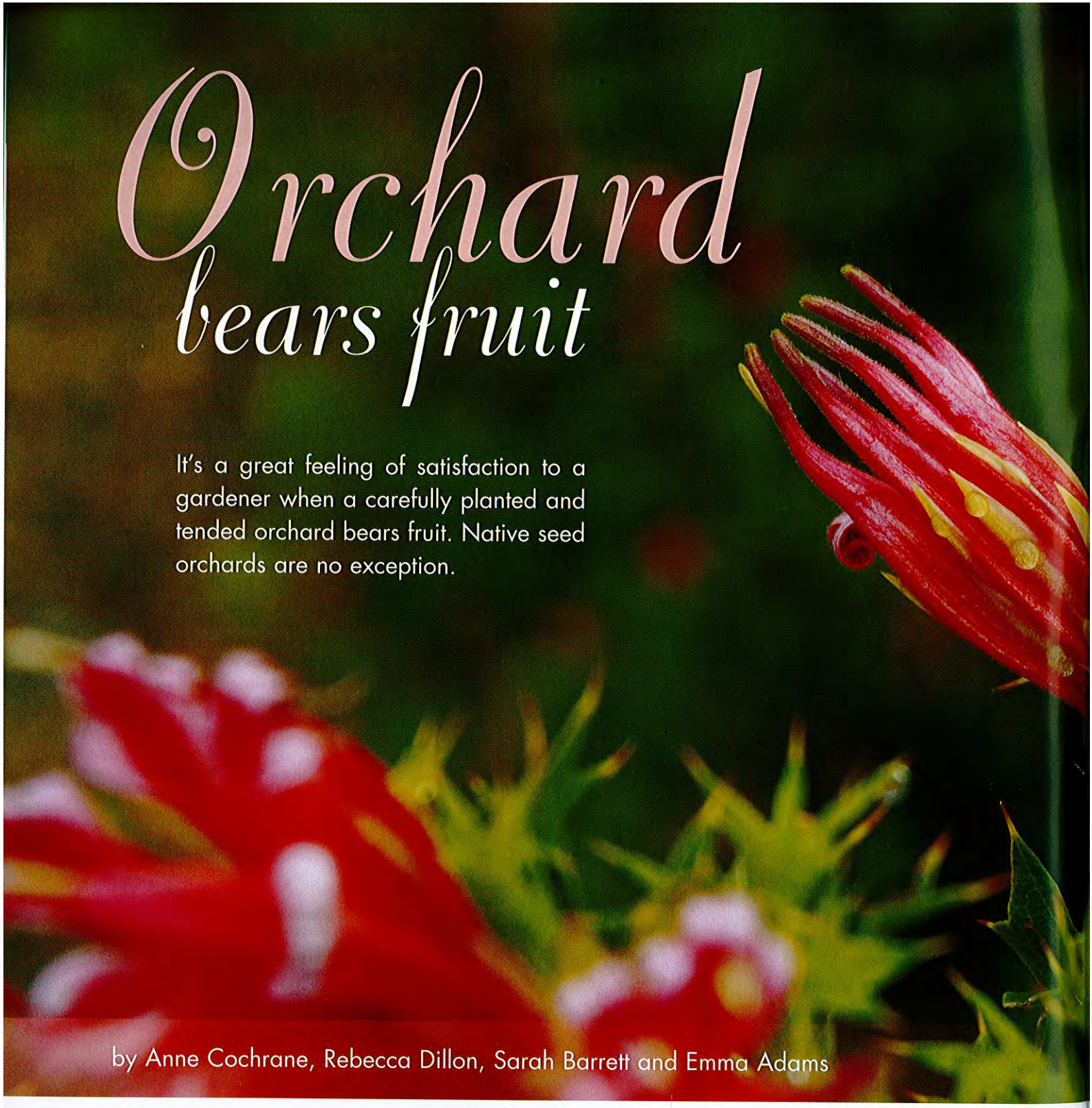
Orchard bears fruit

It's a great feeling of satisfaction to a gardener when a carefully planted and tended orchard bears fruit. Native seed orchards are no exception.



by Anne Cochrane, Rebecca Dillon, Sarah Barrett and Emma Adams

The prickly honeysuckle (*Lambertia echinata* subsp. *echinata*) is known from only several small groups of plants in Cape Le Grand National Park, east of Esperance. It inhabits windswept coastal slopes and occurs in sandy loams over granite among coastal heaths rich in species from the families Myrtaceae (eucalypts, peppermints, paperbarks and claw flowers) and Proteaceae (bankias and hakeas). Its leaves have long sharp points and the woody fruits are beaked. The trumpet-shaped flowers occur from late winter to late spring and are predominantly bird-pollinated. Most plants occur near the crystal clear, sparkling waters of Lucky Bay, one of Western Australia's most beautiful beaches.

Dieback and other risks

Unfortunately, this attractive orange-red flowered shrub is on the brink of extinction. Although the species was declared rare in 1980 and ranked as critically endangered in 1995, the number of plants in the wild continues to decline. Plants are highly susceptible to the deadly plant disease caused by the pathogen *Phytophthora cinnamomi*, which infests a large portion of the park. One group of plants inhabits a small 'island' in an old disused gravel pit, already infested with the disease; another is dangerously close to a public visitation site and at risk of trampling and the introduction of disease. Disappointingly, in shadehouse experiments, the prickly honeysuckle

Above View over Lucky Bay from the location of one of the wild populations.
Photo – Emma Adams/DEC

Left Unopened flowers of the prickly honeysuckle.
Photo – Anne Cochrane/DEC

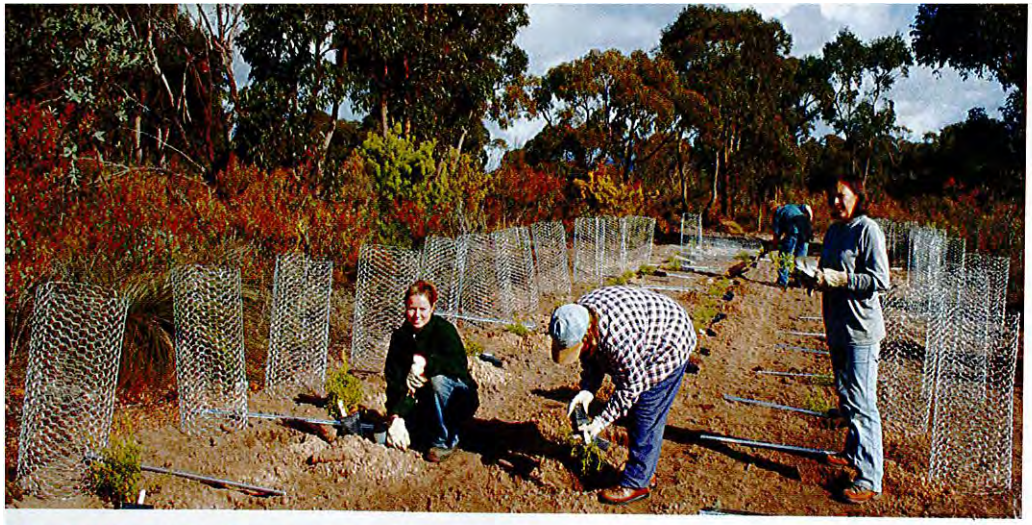
Below left Immature beaked fruits of the prickly honeysuckle.
Photo – Emma Adams/DEC

shows a poor response to the application of phosphite, a fungicide which halts the decline of a number of other highly susceptible species. However, phosphite does protect the habitat of the plants, providing protection from the indirect effects of the disease (for example, reduced canopy cover) as well as slowing the spread of the pathogen.

Despite many surveys, no new locations of the prickly honeysuckle have been found since 2001. It is currently only known from three disjunct populations and about 254 plants, 141 of which are juvenile plants and not yet reproductive. This means the species is now also threatened from having a limited gene pool. This may ultimately reduce its ability to respond to threats such as climate change.

Recovery actions initiated to safeguard these plants from extinction include the collection and conservation of seeds and the translocation of plants back into the wild. About 4,000 seeds have been collected and conserved at the Department of Environment and Conservation's (DEC's) Threatened Flora Seed Centre from 64 plants in three wild populations, with 12 collections made over 13 years. Seeds from these collections enabled a number of translocations into the wild, one in 1998–99 and two in 2004.

Until recently, all efforts to create new populations have failed. At two sites, plants died as a result of *Phytophthora* dieback and, at the other site, plants succumbed to drought. Despite these failures, the resulting increased understanding of the ecology of the prickly honeysuckle will improve future recovery efforts. With the species' natural environment so heavily infested by *Phytophthora*, finding a new translocation site within the park has also been a major challenge. As a last resort, sites outside the species' known distribution were chosen to save the prickly honeysuckle from potential extinction.



Left Planting seedlings into the seed orchard.

Below left The Albany seed orchard three years after planting.
Photos - Anne Cochrane/DEC

Bottom left The bird-pollinated trumpet-shaped flower of the prickly honeysuckle.
Photo - Emma Adams/DEC

Seed orchards

Seed orchards are established to provide a safe haven for threatened plant species, to boost plant numbers, to create more opportunities for seed collection and to reduce pressure on wild populations for seed collection. Sites such as these can be monitored and managed more easily, as well as manipulated for scientific experiments.

In the rescue mission for the prickly honeysuckle, young seedlings were planted into an existing seed orchard north-east of Albany (see 'A safe haven for threatened plants', *LANDSCOPE*, Summer 2005–06) as well as a newly created one at Dalyup, north-west of Esperance in 2006. Survival of plants at both sites has been very high. Funding from the State Government and the Australian Government through South Coast Natural Resource Management (NRM) has supported these orchards. The Albany and Esperance rare flora recovery teams and members of the community volunteered their time to assist with the planting.

Fruits of their labours

After a number of years of careful watering, excluding herbivores and monitoring of growth and flowering, the prickly honeysuckles in the seed orchards have finally produced fruit. Initially predated by parrots and insects, undamaged ripe fruits were first seen in 2009 and seeds were collected from reproductive plants from July that year. Material from 15 plants at Dalyup and 55 at Albany have been harvested so far, with a total of 750 seeds collected in 2009. Some 200 of these seeds were germinated at DEC's Threatened Flora Seed Centre and provided to the Botanic Gardens and Park Authority's Kings Park accredited disease-free nursery which then supplied the resultant seedlings for a new translocation aimed at boosting plant numbers in the wild.

Preliminary mapping and soil sampling for *Phytophthora* at more than 20 potential translocation sites revealed the presence of the pathogen in most cases and therefore established the sites as unacceptable. Recently, two new pathogen-free sites were found within nature reserves east of the natural populations. While they are up to 55 kilometres from the natural populations, their soil and plant assemblages are very similar to that of the natural populations. With funding support through the State Government's NRM program, the new seedlings were planted in autumn 2010 and are now being carefully nurtured until they become established.

The outlook for the prickly honeysuckle is now looking brighter. The seed orchards have been a successful enterprise—plants in the orchards were originally created from wild seed sourced from Lucky Bay and, in turn, these plants are providing their own seed for conservation. While there is now less need to collect seed from the wild, the natural populations will continue to be protected and monitored for survival and recruitment. Further research to find an effective means of protecting the last remaining precious plants in the wild by eradicating or halting the deadly *Phytophthora* is a high priority. Continued funding support for maintaining both wild and newly translocated populations will be integral to ensuring the survival of the prickly honeysuckle for the benefit of future generations.

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