



# Global Re-introduction Perspectives: 2010

Additional case-studies from around the globe  
Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)





The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of IUCN or any of the funding organizations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of IUCN.

**Published by:** IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

**Copyright:** 2010 International Union for the Conservation of Nature and Natural Resources.

**Citation:** Soorae, P. S. (ed.) (2010) GLOBAL RE-INTRODUCTION PERSPECTIVES: Additional case-studies from around the globe. IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE, xii + 352 pp.

**ISBN:** 978-2-8317-1320-5

**Cover photo:** Clockwise starting from top-left:  
i. Damselfly, UK © *PC Watts*  
ii. Corn crane, UK © *Andy Hay (rspb-images.com)*  
iii. Western prairie fringed orchid, USA © *Margaret From*  
iv. Arabian oryx, Saudi Arabia © *M. Z. Islam*  
v. Corroboree frog, Australia © *D. Hunter*

**Cover design & layout by:** Pritpal S. Soorae, IUCN/SSC Re-introduction Specialist Group

**Produced by:** IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

**Download document at:** [www.iucnsscscrg.org](http://www.iucnsscscrg.org)

## Enhancement of Monarto mintbush populations in South Australia by translocations

Manfred Jusaitis

Senior Biologist, Department for Environment & Heritage, Botanic Gardens of Adelaide, North Terrace, Adelaide, South Australia, 5000, Australia.  
([manfred.jusaitis@sa.gov.au](mailto:manfred.jusaitis@sa.gov.au))

### Introduction

Monarto mintbush, *Prostanthera eurybioides* F.Muell. (Lamiaceae) is a low, spreading, aromatic shrub growing to 1 m high, bearing small, violet flowers in leaf axils during spring. Plants are killed by fire, but natural recruitment from seed may occur in response to fire (Jusaitis, unpubl. data) or following hot, dry summers where elevated temperatures trigger loosening of the mericarp plug (Ainsley *et al.*, 2008). The plant is endemic to South Australia and located in two disjunct populations, one at Monarto (near Murray Bridge) and the other centered at Mount Monster Conservation Park (near Keith). It occurs naturally on shallow, sandy loams associated with outcrops of granite or schist (Jusaitis, 2005).

Approximately 240 and 390 wild plants remain in the Monarto and Mt. Monster populations respectively. The species is listed as Endangered under the Australian Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and Critically Endangered under IUCN (2001) criteria (CR B2ab(v)). Translocation trials were located at both population centers with the aim of enhancing natural populations while at the same time testing various techniques and management options.

### Goals

- Goal 1: Determine the microsite requirements for translocation success.
- Goal 2: Examine the use of water storage crystals to improve translocation success.
- Goal 3: Examine the influence of weeds and herbivores on growth and survival of transplants.
- Goal 4: Enhance both populations of *P. eurybioides* by the use of translocation.



Flowers of *Prostanthera eurybioides* © M. Jusaitis

### Success indicators

- **Indicator 1:** The completion of an experimental trial to evaluate microsite requirements for successful establishment of *P. eurybioides*.
- **Indicator 2:** The completion of an experimental trial to evaluate the effect of water storage crystals on translocation success.
- **Indicator 3:** The completion of an experimental translocation to evaluate the effects of weed and herbivore control on the establishment success of *P. eurybioides*.
- **Indicator 4:** Survival, flowering, reproduction and recruitment of *P. eurybioides* over a period of 10 years following translocation.



Fenced plot in grazing trial showing seven year old plants. © M. Jusaitis

### Project Summary

**Microsite requirements:** A trial translocation to investigate planting microsite requirements was set up at Monarto. Three microsites were chosen; site 1 was open, exposed and rocky, site 2 was also rocky, but partly sheltered with scattered *Melaleuca uncinata* bushes, and site 3 had no rocky outcrops, and a thicker cover of *M. uncinata* bushes. Ten seedlings of *P. eurybioides* were transplanted into each site in June 1996, and survival and growth of transplants were assessed at regular intervals over the next 7 years. Marked differences in translocation success were observed between sites. Site 1 (open, rocky) outperformed the other sites, with 80% of plants surviving after 1 year, while sites 2 and 3 retained 20% and 0% respectively. Plants at site 1 grew steadily over the 7 years of assessment, while plants at site 2 had a lower growth rate. Site 3 plants declined rapidly in size over their first year, appeared more stressed and suffered more grazing than plants at the other two sites. Mortality was most severe over the first year from planting, after which survivorship stabilized.

**Use of water storage crystals:** Translocation trials were set up at both Monarto and Mt. Monster to study the effect of adding water storage crystals (hydrogel) to the planting hole at planting. Treatment plants received 200 ml of imbibed hydrogel placed at the bottom of the planting hole, while control plants received 200 ml of water per hole. At each site, four replicates of 20 plants (10 plants per treatment) were planted in early winter within the natural population. Plants were grouped in pairs (with and without hydrogel). Survival and growth of translocants were monitored over four years. At neither site was there a significant difference



Staff and volunteers out-planting at Monarto

© B. Sorensen

in survival or growth of plants in response to hydrogel over this time. Plant survival after 4 years averaged 92% at Mt. Monster and 45 % at Monarto.

**Effect of weeds and herbivores:** A translocation trial was set up to study the effect of weeds on transplant establishment. Cutting-derived *P. eurybioides* plants were transplanted into paired 1 m<sup>2</sup> fenced plots (3 replicates) at a weedy site within the Monarto population. One plot of each pair was kept weed-free by hand-

weeding on regular visits to the site over 6 years. A year after planting, 60% of transplants survived in weed-free plots, while all transplants in weedy plots had died. Weed-free survivors were still present after 6 years, having reached an average height of 640 mm.

The impact of herbivores (rabbits, kangaroos) was investigated in separate trials at Monarto and Mt Monster. At Monarto, four 3-month old seedlings of *P. eurybioides* were planted into each of 6 replicate paired plots at each of two sites (Boland's Scrub and Monarto Zoo). One plot of each pair was covered with a wire basket to exclude herbivores, the other was left exposed. After 4 years, 46% (covered) and 8% (exposed) survived in Boland's Scrub, while 50% (covered) and 0% (exposed) remained at the Zoo site. Most plant losses occurred during the first year after planting.

At Mt Monster, eight 12-month old seedlings were planted into each plot of 3 replicate paired plots. One plot of each pair was enclosed by a 3 x 3 m chicken-wire fence designed to exclude rabbits and kangaroos, the other was left open. By year 11 (2006), transplant survival had stabilized at 96% (fenced) and 67% (unfenced). Frequent grazing damage was observed on exposed plants over that time, producing plants that were about one third the size of fenced (un-grazed) plants.

Natural seedling recruitment was first observed in fenced treatments 10 years after translocation (2005). These recruits flowered the following year. Since then, further recruitment has occurred annually in fenced plots. A few recruits were also observed just outside the fenced plots, obviously self-sown from fenced plants, but none were observed directly around unfenced translocants.

**Translocation:** In 1997, the Monarto population was enhanced by the translocation of 126 *P. eurybioides* seedlings. Twelve years after planting, 24% of these plants survived, although many were severely damaged by grazing. Grazing damage on mature plants was generally restricted to the lower 300 mm of the plant, implicating rabbits and possibly other smaller mammals as the predominant herbivores. Although these plants have flowered annually since 2001, no natural recruitment has been observed at this site.

In 1998, 35 seedlings were translocated at Christmas Rocks, and 22 at Kongal Rocks, both sites in the vicinity of, and having similar edaphic characteristics to Mt Monster. Plants at both sites flowered within two years of planting. Ten years after translocation, 88% and 57% of translocants survived at Christmas and Kongal Rocks respectively. Eleven years after planting, 147 seedling recruits were counted around translocants at Christmas Rocks, while 2 were found at Kongal Rocks. The low numbers recorded at the latter site may be due to competition from grassy weeds and bracken fern limiting recruitment.

### Major difficulties faced

- Grazing by introduced or native animals.
- Presence of weeds at some sites.
- Some years of below average rainfall resulted in mortality of fenced, ungrazed plants at Mt Monster. This may be due to the size difference between grazed and ungrazed plants, the latter being significantly larger and having greater leaf surface area than unfenced, grazed plants. Larger plants would experience greater transpirational losses, and so would be more susceptible to water stress than the smaller, grazed, unfenced plants.
- Planting/fencing difficulties in rocky terrain.
- Lack of knowledge about seed germination when project started.

### Major lessons learned

- The microsites trial showed that the presence of rocky outcrops together with a relatively exposed outlook are important determinants for translocation success for *P. eurybioides* (Jusaitis, 2005).
- Water storage crystals added to the planting hole did not significantly improve the recovery of this species.
- Weed control is essential when translocating *P. eurybioides* into weed-prone sites.
- Adequate grazing protection is important, particularly during the early stages of plant establishment, to encourage vigorous growth, rapid seed production and ultimately natural recruitment.
- Established plants are less susceptible to grazing damage once they reach their mature height.
- Seedling recruitment occurred naturally at Mt Monster after a series of hot, dry summers followed by good winter rains. Recruits were all found within 1-2 m of parent plants, suggesting that seed dispersal may be limited to this range.
- Marked differences exist between the two populations (Monarto, Mt Monster) with respect to recruitment success. No recruits were observed at Monarto

over 12 years of monitoring, whereas Mt Monster translocations recruited within 10 years of planting.

## Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

### Reason(s) for success/failure:

- Demonstrated successful translocation, establishment, reproduction and recruitment of *P. eurybioides* at Mt. Monster and two nearby reserves (Christmas Rocks and Kongal Rocks).
- Demonstrated successful translocation, establishment and reproduction of *P. eurybioides* at Monarto, although recruitment was not observed during 12 years of monitoring.
- Early research on the effects of microhabitat, grazing and weeds on translocation success enabled scientifically based site selection and site preparation for subsequent translocations.
- Local volunteers contributed substantially to the on-ground tasks that were required.
- The project was based on good science from the outset, and sites were monitored and managed frequently over the long term.
- All four goals were successfully achieved, according to their respective success indicators.

## References

Ainsley, P. J., M. K. Jones, & T. E. Erickson. 2008. Overcoming physiological dormancy in *Prostanthera eurybioides* (Lamiaceae), a nationally endangered Australian shrub species. *Australian Journal of Botany* 56: 214-219.

IUCN. 2001. IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

Jusaitis, M. 2005. Translocation trials confirm specific factors affecting the establishment of three endangered plant species. *Ecological Management & Restoration* 6: 61-67.

Obst, C. 2005. South Australian Murray Darling Basin Threatened Flora Recovery Plan. Report to the Threatened Species and Communities Section, Australian Government Department of the Environment and Heritage, Canberra.