Tackling threats to plant diversity on the south coast of Western Australia

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The Western Australian (WA) Department of Environment and Conservation’s South Coast Region encompasses 1.8 million hectares or 7% of WA. The Region takes in a number of southerly flowing rivers and contains south west WA’s only major mountains, in particular, the Stirling Range. The floral diversity of the Fitzgerald Biosphere, centred on the Fitzgerald River National Park, has been recognised internationally since 1978 as part of UNESCO’s Man and the Biosphere Program. To the east the limestone karst of the Nullarbor adds a further dimension to this biodiversity. Many of the Region’s species currently have distributions that are extremely limited in terms of climate and landform. There are 4887 known plant taxa, 8.5% of these endemic and 20% of conservation concern.

Threatening processes that impact on this rich floral diversity include introduced diseases such as *Phytophthora cinnamomi*, frequent and extensive wild fires, weeds, salinity and habitat fragmentation. More recently, the threat of warming temperatures and changes to rainfall distribution have received attention and along with mountain regions, the heath communities of south west WA have been identified as highly vulnerable to the effects of climate change. On the south coast species are at the limits of their southerly distribution and have no means of dispersal to cooler or wetter climates. Interacting threats will very likely increase the risk of extinction for species that are already vulnerable.

The Region’s biodiversity has long been recognised as nationally important. Through the South Coast Natural Resource Management Inc. the Commonwealth provides financial support to the Department of Environment and Conservation to help manage and conserve this unique biodiversity. Commonwealth funds have also supported the writing of a pilot South Coast Regional Threatened Species Recovery Plan to prioritise and integrate recovery actions on a landscape basis.

### Disease management

The fungicide, Phosphite, is used to enhance the survival of susceptible species and reduce spread of *Phytophthora cinnamomi* infestation. Application methods include low volume foliar spraying via fixed-wing aircraft, and trunk injection. Hand spraying high intensity phosphite trials are also being conducted across the region. Target species and sites are monitored for survivorship and rate of disease spread (Fig 1). A novel approach to Phytophthora dieback management in the Region includes a impermeable membrane to contain current infestation and fencing is used to prevent disease spread by animal vectors.

### Demographic monitoring

Long term monitoring and demographic studies confirm population health and status, providing knowledge on species ecology and biology for conservation management. Documenting juvenile period for key plant species assists in developing fire management strategies.

### Fire management

Strategies for fire management and their implementation are being developed for significant conservation reserves in the Region. These strategies consider various scales and aspects of fire management, from the requirements of threatened and fire sensitive species, to specific plant communities and landscape features.

### Weed eradication

A WA state government biodiversity conservation initiative (Save Our Species) supports the reduction, and in some cases, the total eradication, of key weed species found in the region. Trial plots have been established to monitor success of hand removal and chemical control methods. An education program has been instigated to raise community awareness.

### Translocation and restoration

Critically endangered flora species may require recovery actions such as translocation of plants to prevent extinction in the wild. Establishment of seed orchards for threatened species aims to reduce pressure on wild populations. The South Coast Macro Corridor Project uses a regional approach to enhance connectivity between large reserves on the South Coast, providing strategic guidelines for prioritisation of areas for restoration.

### Seed conservation

Collection of genetic material for conservation is an insurance against loss in the wild and provides material for species recovery. Seeds are also available for a range of research investigations including assessment of species susceptibility to threatening processes.

### Figure 1. Survival of critically endangered Banksia anatona in phosphite sprayed and non-sprayed plots, Stirling Range 2002 - 2007.