Progress Report SP 2000-015

The population ecology of critically endangered flora

Plant Science and Herbarium

Project Core Team

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Project Team	granted
Program Leader	granted
Directorate	granted

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Context

South-west Western Australia is a global hotspot of plant diversity. Determining the relative importance of multiple threatening processes, including the interactions between fragmentation and small population processes, fire regimes, weed invasion and grazing regimes, is critical for conservation and management of threatened flora (Declared Rare Flora) and Threatened Ecological Communities.

Aims

Determine the critical biological factors and the relative importance of contemporary ecological interactions and processes that limit population viability and persistence of threatened flora, particularly Critically Endangered species and other key plant species occurring in Threatened Ecological Communities.

Progress

- Continued monitoring the demography of the Critically Endangered *Verticordia staminosa* subsp. *staminosa* in relation to a drying climate in south-west Western Australia
- Established micro-climate sensor array in the Ravensthorpe Range to develop climatic layers at appropriate scales for modelling the distribution of short range endemics under the influence of a projected warmer and drier climate.
- Microclimate data collection from Ravensthorpe Range completed.
- Data compiliation of Ravenshorpe Range microclimate data completed.
- A paper on fire response of threatened flora in the south west has been finalised and will be submitted to Biodiversity and Conservation.
- Undertaken analysis of range size in Threatened and Priority shrub species in the south west to better understand possible extinction debt.

Management implications

The long-term monitoring of the eastern Stirling Range Montane Heath and Thicket community and comparison with historical sources has demonstrated dramatic changes in the community as a consequence of *Phytophora cinnamomi* and recent fire regimes. Using the International Union for Conservation of Nature (IUCN) Ecosystem Risk Assessment criteria this community is ranked as Critically Endangered. Continued management of *P. cinnamomi* through phosphite application and managing the fire return interval will be critical to conserve the remaining values of the thicket, together with an *ex-situ* conservation program for the most threatened species.

A review and analysis of the fire response of threatened flora and the development of fields in the threatened and Priority Flora database will assist in the design an delivery of improved fire management protocols for threatened flora.

The analysis of extinction debt in the highly fragmented south west landscape will further assist in the development of protocols for prioritising threatened flora for management intervention and recovery actions.

Future directions

- Continue to write up and publish research on the eastern Stirling Range Montane Heath and Thicket Community.
- Continue monitoring *V. staminosa* subsp. *staminosa* and begin analysis of long term monitoring data-set investigating the effects of declining rainfall on the recent dynamics of the population.
- Analyse data from micro-climate sensor array in the Ravensthorpe Range.

- Publish paper on fire responses of threatened flora
- Continue analysis of Threatened and Priority Flora database records to estimate the level of extinction debt for threatened plants in the highly fragmented south west landscape and prepare a draft manuscript.