

Parks Victoria Research Partners Panel

Project Summary Report

Exploring the flooding tolerance of two ecologically important woody riparian plant species

Parks Victoria and The University of Melbourne

Background

Melaleuca squarrosa and *Leptospermum lanigerum* are dominant mid-storey species in the FFG-listed Sedge-rich *Eucalyptus camphora* Swamp community within Yellingbo Nature Conservation Reserve, and provide important habitat for the critically endangered Helmeted Honeyeater and lowland Leadbeater's Possum. In some areas, these species are being affected by dieback and there is a lack of sexual recruitment, thought to be associated with a shift from the natural water regime towards more waterlogged conditions. This project assessed these species' abilities to cope with waterlogging and flooding at a number of important life history stages to inform future management of Yellingbo.

Aims

- To compare both species' abilities to cope with waterlogged and flooded conditions
- To identify how important life-history stages of these species are affected by waterlogging and flooding

Results

- Seeds of both species are able to germinate underwater, although drawdown is required for growth beyond the cotyledon stage
- Early establishment was the life-history phase most greatly affected by flooding, with >4 weeks complete submergence reducing survival to 40% for *M. squarrosa* and >6 weeks reducing survival to 30% for *L. lanigerum*
- Development of aerenchyma and adventitious roots are important mechanisms of survival in flooded conditions for these species
- *Leptospermum lanigerum* is the more flood tolerant of the two species

Implications

- Lack of germination is not caused by inappropriate water regime preventing germination, as both species are able to germinate underwater
- Rather, it is the early establishment phase which cannot cope with extended periods of total submergence. Depths at which young seedlings are completely submerged, and durations of >4 weeks for *M. squarrosa* and >6 weeks for *L. lanigerum* should be avoided in order to promote recruitment of young seedlings
- Sexual recruitment is most likely to be successful in well drained-to-waterlogged soil conditions where water level fluctuations are unlikely to completely submerge seedlings

Relevant parks and ecosystems

Yellingbo Nature Conservation Reserve
Wetland forest

More information

Contact Parks Victoria on 13 1963

Publications and presentations

Zacks, G. (2015) The flooding tolerance of two ecologically important woody riparian plant species. B. Env (Hons) thesis. School of Ecosystem and Forest Sciences. The University of Melbourne.



A section of dieback-affected vegetation within Yellingbo Nature Conservation Reserve



Adventitious root formation (left) and stem hypertrophy (right) are important mechanisms in the survival of these species in waterlogged environments