FLORA

FIVE YEARS CARING FOR WANDOO

Liz Manning

Background

Last October, a seminar on wandoo conservation, held in York and hosted by the Wandoo Recovery Group (WRG), attracted 100 delegates including community group leaders, land managers, scientists and researchers. It highlighted major achievements in research and mapping, shared information, and acknowledged the enormous contribution of local communities.

Wandoo (*Eucalyptus wandoo*) is a valuable woodland tree species of south-western Australia, and endemic to the region. It provides essential habitat for wildlife, a source of high-quality honey, yields first-class structural timber, plays a vital role in watershed protection and amenity and is a keystone species and indicator of ecosystem health. Unfortunately, since at least the 1980s, wandoo trees across their range have suffered deteriorating health, indicated by a decline in the tree crown. This has raised considerable concern.

The WRG was formed in 2003 to investigate the causes of decline in wandoo and coordinate appropriate strategies and actions. The WRG focuses on four priorities:

- research – to identify the causes of decline;
- mapping – to understand the extent, frequency and progression of decline;
- communication – through an ongoing public education programme; and
- building partnerships with stakeholders and interest groups.

Survey and mapping

To better understand when and where declines occur, WRG coordinates a Woodland Recovery Project, assisted by the Department of Environment and Conservation (DEC), WWF–Australia and a $71,295 Lotterywest grant. The project includes an historical review of wandoo, community surveys to record and monitor wandoo health, and a public education program.

Historical review: Dr Andrea Gaynor from the University of WA (UWA) undertook this research to find out whether the current decline episode is historically unique or cyclical. It involved interviews with people who have lived and worked in wandoo country, together with photographic, archival and other historical literature. Two focus areas were chosen for the study: Kojonup and surrounds, and the areas north and east of Mundaring (including Julimar). A booklet *Wandoo in health and decline – a history* has been produced and its findings strongly suggest wandoo decline has only emerged at significant levels since the 1980s.

Community surveys: Volunteers, TAFE colleges and conservation workers are helping the WRG assess the health of wandoo trees at sites across the south-west. Twenty-two sites have been established on private property, reserves and national parks between Chittering and Cranbrook. Results from the surveys give information on stand structure (number and density of trees), extent of recent branch death and current crown health at each site. Results indicate:

- there are no obvious geographical trends in crown decline across these sites, with healthy and unhealthy sites widely distributed;
- wandoo crowns can decline quickly when extensive flagging occurs;
- progression of decline and recovery is determined by flagging and epicormic growth;
- the intensity of flagging and vigor of the trees' response ultimately determines the strength of decline or recovery; and
- the three years of these surveys have shown relatively little change - gradual improvement, no change, or slow decline.

Review of wandoo decline across the wheatbelt and State forest

In 2002, a survey of wandoo decline created a snapshot of wandoo health across three broad transects covering 600 km (129 sites), spanning wandoo's east-west range. In 2008, a second survey was undertaken to examine factors thought to predispose trees to decline, and establish trends in wandoo health. While decline continues to occur, recovery is evident at some sites appearing strongest along the northern transect around York, decreasing along the central transect (near Wickepin) and the southern transect (around Cranbrook) respectively. The WRG coordinated the project with funding from Regional NRM Councils and DEC. WWF helped administer these funds.

Research

Research through UWA and supported by DEC, is studying the relationships between climate, tree physiology and the insects and fungal pathogens thought to be contributing to wandoo decline.

Environmental studies have revealed important differences in how wandoo tolerates drought conditions compared to other eucalypts like jarrah and marri.

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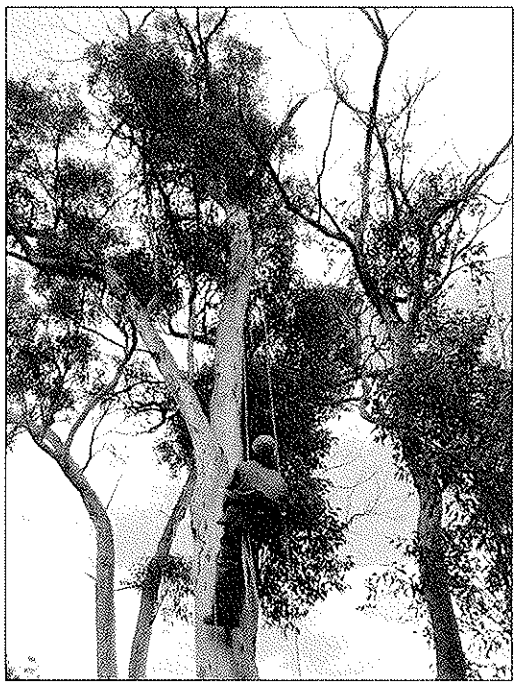
Wandoo decline

Wandoo is able to extract large amounts of water from dry soils, but this produces enormous tensions in the sapwood, which can ultimately lead to hydraulic failure if soils dry out too much. UWA's Erik Veneklaas, Pieter Poot and visitor Fabiano Scarpa are investigating whether the tensions previously observed in the different species are likely to cause embolisms (air bubbles that render vessels useless for water transport) that would reduce the tree's ability to supply foliage with water.



Ryan Hooper installs monitoring equipment in a wandoo in the Helena Catchment. Photo: L. Manning

Insects and fungal studies undertaken by Ryan Hooper identified a wood-boring insect (Coleoptera: Buprestidae), as the primary contributing factor in dieback and decline of wandoo trees. Fungal pathogens isolated on dying branches were not particularly aggressive and are commonly found in eucalypt trees. Rather, it is thought activity of the insect and its high emergence rate during the recent severe decline in Talbot forest (in the 1990s) facilitated damage by these normally benign organisms. Active populations of the borer were evident in areas recently affected by decline. Understanding the balance between borer populations and tree response is a crucial factor in the decline and recovery cycle, which must be viewed in a time frame relevant to wandoo's life span. To aid in this understanding, Ryan is currently monitoring phenology (development of bud formation, flowering and seed set) and growth in the wandoo forest.

Future research into tree decline will be coordinated through the State Centre of Excellence; Woodland and Forest Health and embodied in four programs:

- climate change, woodland and forest declines;
- decline ecology;
- restoring biodiversity values ; and
- policies and action for woodland restoration.

Other WRG initiatives include an action plan to direct research, mapping and communications with an emphasis on public participation. News bulletins are widely circulated and stories about wandoo have appeared in DEC publications, rural papers and NRM newsletters. Information days and workshops have been held at Dandaragan, York, Wyalkatchem, Dryandra, Helena catchment, Cranbrook and Chittering. A public forum and science workshop hosted in 2005, and a woodland decline symposium in 2006, were strongly supported.

The WRG greatly appreciates the enormous interest and support by community groups, TAFE colleges, NRM councils, conservation workers, DEC, WWF and Lotterywest. Without this support many projects would not have been possible.

For more information and references contact WRG Executive Officer, Liz Manning on 0427 441 482 or email: lizmanning@bigpond.com.

Congratulations!

To the Botanic Gardens and Parks Authority and Rocla Quarry Products for winning a Golden Gecko Award, in recognition of their ground-breaking research that is finally unlocking the secret to restoring banksia woodland. (Golden Geckos are awarded to the mining and development industry for excellence in environmental management - and the competition is fierce.)

In 1995, Rocla Quarry Products engaged Kings Park with a research proposal to restore the original banksia woodland community after sand mining. The current compliance standard was the return of native vegetation. Thirteen years later, this partnership has achieved beyond compliance standards of rehabilitation and demonstrated excellence in banksia woodland restoration. The improved scientific understanding of banksia woodlands has applications right across the Swan Coastal Plain for the management of similarly cleared areas and urban woodlands.

Not only do we congratulate Kings Park on unravelling the science, but also Rocla for continuing to support that research after the legal minimum requirements had been met. Well done to all concerned!

For more information, visit www.bgpa.wa.gov.au