Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Monitoring sandalwood (*Santalum spicatum*) populations

Background

Sandalwood (*Santalum spicatum*) naturally occurs in Western Australia across 173 million hectares, in the wheatbelt and through the arid and semi-arid rangelands. It is culturally, medicinally and nutritionally important to Aboriginal peoples. Both living and dead trees are ecologically important and economically valuable, and both are commercially harvested for the aromatic oils contained in the heartwood.

Population and plant condition can vary considerably due to a range of impacts associated with land use changes since the 1800s.

There is concern that a lack of natural regeneration of wild sandalwood is threatening long-term stability of populations. For example, in 2014, Brand et al.[1] stated that unless intervention is taken, wild trees from locations in the Murchison and Yalgoo biogeographic regions will largely disappear within 50 to 60 years. As such, re-seeding and regeneration programs are important for sandalwood conservation.

Wild sandalwood distribution in Western Australia.

Existing sandalwood data

Some sandalwood measurement plots were established as early as the 1920s, providing information on numbers of trees and their sizes. Systematic survey of sandalwood commenced in the 1980s in some regions. More recent sandalwood population analysis has been based largely on data collected in the 1990s and 2000s.

Regular monitoring

It is vital to understand rates of population increase or decline and the occurrence and patterns of recruitment as this information helps to shape management approaches to meet requirements of the **Sandalwood Biodiversity Management Programme**. In particular, information can be used to provide further guidance on sustainability factors essential for species conservation.

Measuring sandalwood diameter

1 Brand, J.E., Sawyer, B. and Evans, D.R. (2014). The benefits of seed enrichment on sandalwood (*Santalum spicatum*) populations, after 17 years, in semi-arid Western Australia. *The Rangeland Journal* ***36*** (5): 475-482.

Monitoring sandalwood (*Santalum spicatum*) populations

Monitoring helps to provide information on:

- estimated average growth rates
- levels of natural mortality versus artificial mortality (e.g. damage by introduced herbivores)
- population structure
- any changes to rates of natural regeneration
- appropriate levels of re-seeding for a healthy population
- changes to sandalwood distribution within the landscape
- possible impacts due to threatening processes such as climate change.

Monitoring information also helps to inform:

- acceptable harvest levels for green and dead sandalwood
- appropriate minimum tree size class for harvest
- appropriate region-specific protocols for ecologically sustainable use.

In addition, monitoring can be undertaken to determine success of re-seeding and/or regeneration programs.

Regeneration

Remote sensing

As sandalwood covers such a vast area with different land uses, landforms, environmental conditions and threatening processes, it is not possible to get a perfect assessment of the total population.

In more recent times, a trial using a drone to investigate the viability of remote sensing to provide information on sandalwood populations was undertaken. More work is needed to develop the technology to reliably detect sandalwood or sandalwood habitat.

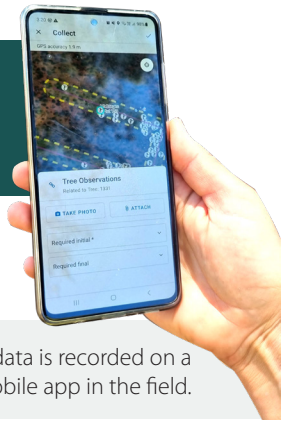
Monitoring team

Current monitoring

Since October 2022 until now, a significant number of plots have been measured to provide further information on sandalwood population condition.

Data collected recently includes remeasurement of plots established 20 or more years ago, as well as newly established plots in priority areas where information is lacking. Plots will be monitored at appropriate intervals.

For more information refer to dbca.wa.gov.au/management/sandalwood



Plot data is recorded on a mobile app in the field.

For further information please contact sandalwood@dbca.wa.gov.au.

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Information current as at October 2024.
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