

An investigation into the impact of commercial harvesting on recruitment in natural populations of Western Australian sandalwood (*Santalum spicatum*).

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The natural stocks of many sandalwood species (*Santalum* spp.) world wide have been heavily exploited to near exhaustion or extinction for the valuable wood and oil. Indian sandalwood has been used by Eastern cultures for many centuries full carved religious artefacts and incense burning. Sandalwood oil has a long established traditional cultural and medicinal uses. It is also used in soap, detergents, deodorant, perfume and cosmetics manufacture.

In Western Australia *Santalum spicatum*, a slow growing, long-lived species was discovered not long after European settlement and has been heavily exploited since the 1850s to satisfy the high demand principally in Asia. Formerly widespread populations in the Wheatbelt have disappeared due to harvesting and land clearing and a now only minimally represented in nature reserves in that region.

Western Australia nonetheless produces 60% of the world supply sandalwood with a majority of annual Crown land harvest up to 1500 tons of greenwood sourced from Eastern goldfields, Murchison and Gascoyne regions. Over harvesting, herbivore predation, fire, or seed dispersal in competing land uses in now dysfunctional landscapes have contributed to the decline of populations in these regions.

This study reviews the current literature and two previous Crown land resource inventories. A preliminary assessment employing standard excepted industry practice was undertaken to investigate and compare population dynamics of *S. spicatum* in eight harvested and unharvested sites in the eastern goldfields of Western Australia. The results show that significant differences exist in demographic structure between harvested and unharvested sites examined in the arid climate zone. Fewer merchantable trees were found in harvested sites with negligible numbers all juveniles recruited. From an ecological viewpoint these sites were cause for concern as they are not recovering from harvesting and are in decline. A site in the semi arid climate zone subject to multiple episodes of harvesting displayed similar population decline.

These findings and those of others suggest the status of sandalwood in the arid climate zone is under threat as a consequence of commercial harvesting, therefore a more detailed investigation populations in harvested and unharvested areas throughout the range of its occurrence is warranted. A subsequent rigorous and independent assessment of the extent, nature and economic life of the remaining available stock of the Crown land resource should also be conducted. A commercial harvest level consistent with ecologically sustainable practices in the semi-arid zone, the cessation of commercial harvesting in previously multi-harvested sites in this zone and harvesting generally in the arid climate zone are suggested industry initiatives to conserve and protect the remaining Crown land resource.