

Katinka opened by remarking that Tuart trees are at risk because they grow where everyone wants to live! Only approximately 30% of the trees remain of pre-European settlement estimates.

When including existing mature trees into urban landscape it is crucial to consider that the roots of each individual tree will extend to at least the area of the canopy, perhaps further. Left in isolation, in a paved or similar area, they may die. She quoted a wise farmer who said trees often 'die of loneliness' and agrees that they survive best in groups with a generous understory area to maintain the symbiotic relationships of flora, fauna and fungi they need.

Some of the threats to the Tuarts are clearing, altered fire frequency, pests (particularly on stressed trees) and the decreasing rainfall we are experiencing. Figures from the Water Corporation confirm that water, in dams and stream flow is reduced, with 2010 being the driest year on record.

Figures for Yalgorup National Park reveal that in some sites, there was a 90% mortality in tuart trees. since the decline began in the late 1990's. Murdoch University has been conducting research in the Tuart Forests since 2003.

Caused of such tree declines can be grouped under two headings –

ABIOTIC FACTORS including

- Reduced rainfall
- Changes of hydrology including increased salinity and changes to depth of freshwater lens
- Reduced fire frequency
- Increase in understory, increased competition for moisture and nutrients

BIOTIC FACTORS including

- Pests – some beetles attack stressed trees
- Disease – another 'dieback' species has been discovered *Phytophthora multivora* which has been associated with declining tuart trees.

Restoration of degraded woodlands can have two aspects ie regeneration for self-sustainment and increasing the success or revegetation. Interventions include reducing or dealing with threatening processes, reversal of ecosystem degradation and reintroduction of local species and fauna. Management of threats would include control of clearing or fragmentation, and maintaining managed fire regimes. Reversal of ecosystem degradation should take into account whether moisture, nutrients and competition has been altered. Then we can consider reintroducing flora, fauna and fungi. Also, perhaps mimicking natural recruitment requirements of each species can help us increase the success of revegetation. For example, in Tuart, some natural germination can be as many as 27 trees per sqm in cohorts.

Revegetation requirements do vary but eucalypts mostly 'mass seed' after fire. The seed can be 'harvested' by ants to become ant food! The seed can survive for six months in the soil. The research has confirmed that creation of ash beds (burning logs etc) will improve early establishment. Trials prove that early (by early June at the latest) planting is most successful, prior ripping of the soil is beneficial and additional nutrient (fertilizer pellets) improve growth..

Another area of ongoing research is comparing the use of the traditional 'soft' plastic bags as opposed to rigid ventilated bags with respect of summer temperature. Recent research has suggested that inside soft plastic bag is ten degrees hotter than outside. We could be cooking our seedlings on very hot days!

The health of all our forests has implications for our fauna. There is need to ensure security of larger areas and connection of smaller areas of forest. We must be smarter with our restoration as we cannot afford to lose precious seed or plants. To do this, community involvement is the best tool.