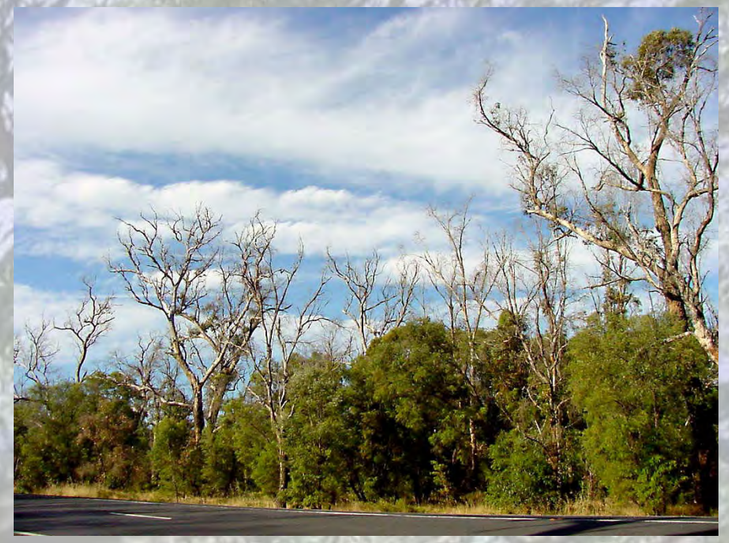
What is killing Tuart??

Tuart (*Eucalyptus gomphocephala*), a magnificent woodland tree endemic to the Swan Coastal Plain, is undergoing a severe decline or 'dieback' in some areas.

Tuart Response Group

Extent of decline

Since the early 1990's the decline in tuart health has been very noticeable between Mandurah and Bunbury. The most severe decline has occurred near Preston Beach in the Yalgorup National Park 30 kilometres south of Mandurah, and on freehold land, where virtually all existing tuart trees across age classes have morbidity and mortality rates as high as 90 per cent in some areas.



Typical decline of tuart observed whilst travelling south from Mandurah. (Photo: Giles Hardy)

Aerial photograph of tuart forest in Yalgorup N.P. showing the extent of dead trees and a dense green understorey of peppermint (Photo: David Mitchell).

Implications

Tuart decline and death may have a severe impact on the flora and fauna of these woodlands. There are 414 native vascular plants recorded for tuart, including the threatened *Acacia benthamii.* Present research has classified 158 species of vertebrate fauna including the Western Ring Tailed Possum persisting at Ludlow and the vulnerable Carnaby's Black Cockatoo. Invertebrate animals are poorly known and are vital for tuart ecology.

What are the causes?

The primary reason(s) for the recent increased decline and chronic insect infestation in tuart is not clear, as there are a number of contributing and inter-related factors. Potential influences include the ongoing decline in winter rainfall, hydrology and salinity changes near wetlands, insect borers (*Phorocantha impavida*), soil pathogens, nutrient supply, altered fire regimes, competition with understorey species, adjacent clearing and roadworks.

Clockwise from top left: Invasion of Arum Lilies in Ludlow State Forest (Photo: Todd Edwards); fungal infection of tuart foliage (Photo: Paul Barber); borer (*Phorocantha* sp.) larva (Photo: Martin Landolt); re-sprouting of tuart after fire (Photo: Robert Archibald).

Lake Preston (Yalgorup N.P) showing dead Tuart in background (Photo: Robert Archibald)

New research program

The ARC are funding research into 'Tuart decline' involving collaborations between CALM, Murdoch University, Edith Cowan University, ALCOA World Alumina Australia, the Mandurah City Council and the Government's Tuart Response Group. The following are some of the areas being investigated:

- **the interplay between water availability to the root zone and tuart physiology;**
- **the role of fire regimes in the decline and also in shaping the structure and composition of tuart communities;**
- **measurement of the health of tuart across its range and correlations with environmental variables;**
- **relationship between borers (*Phorocantha* spp.) and decline, documentation of the diversity of insects associated with tuart, and investigating the use of insecticides to control the borers and**
- **identification of fungal pathogens and their impact on tuart.**

Integration

Researchers from the various organisations are collaborating closely to determine correlations between the various factors that may be contributing to the decline.

For further information contact either Paul Barber, Ph: 9360 2605 or Giles Hardy, Ph: 9360 6272.