Government of Western Australia
Department of Parks and Wildlife

Tree decline observations, Department of Parks and Wildlife, Great Southern District vehicle compound, 2003 – 2014

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Summary

In 2003, several trees on the western side of the Great Southern District vehicle compound were noted to be exhibiting symptoms similar to Mundulla Yellows (MY). As the site was adjacent to a seedling production nursery (seedlings have the potential to be a vector for MY spread), symptom progress was monitored annually. In the last two assessments, the severity of symptoms had not progressed and it was decided monitoring should cease.

After a decade of monitoring and discussion of the observations, my conclusion (in conjunction with Mike Stukely ex VHS manager) is that the initial decline was more likely a result of herbicide damage (though the timing, application rate or herbicide type was unknown). One of the original diagnoses – that of Mundulla Yellows – can now reasonably be discounted.

No further monitoring is required.

Key words: Mundulla Yellows, Narrogin, *Eucalyptus wandoo*, *Eucalyptus gardneri*

Introduction

In May 2003, Kim Kershaw and Peter White observed yellowing crowns in several trees to the south west of the Great Southern District vehicle compound (Map 1). Most were naturally occurring *Eucalyptus wandoo* subsp. *wandoo*, though a planted *E. gardneri* subsp. *gardneri* was also affected. The trees were a variety of sizes and ages, spread over an area of approx. 100m x 50m.

Symptoms

The symptoms of Mundulla Yellows (MY) (Fig. 1), as detailed in the Landscope article by Hanold and Stukely (2002), show distinctive foliage chlorosis (decreased amount of chlorophyll) of the inter-marginal leaf area. The pronounced yellowing of the foliage in the Narrogin trees (Fig. 2) was similar as it occurred as interveinal chlorosis.

However, the Narrogin sample shows a much more general chlorosis, as well as retaining buds and seed capsules which is not a feature of MY. In comparison, damage due to herbicides is characterized by the interveinal areas remaining green (Fig. 3).

Fig. 1: A jarrah leaf showing interveinal yellowing (top) compared with one that is healthy. Photo – Mike Stukely

Fig. 2: Foliage of Narrogin *E. wandoo* showing interveinal chlorosis

Fig. 3. Herbicide damage to *Eucalyptus wandoo* foliage

Other trees showing typical MY symptoms that have been observed in the Great Southern District e.g. *Eucalyptus loxophleba* subsp. *loxophleba,* have continued to decline – see File 2009-2351.

Recording

Four of the affected the trees were photographed, initially every year. This was increased to twice a year from 2006 (see Figs 4,5) to assess changes in seasonal expression of symptoms between summer and winter; the yellowing of the foliage, especially in the *Eucalyptus gardneri* (Fig. 4) appeared to be more pronounced in summer than winter, but there was no apparent effect on foliage density. In comparison, the symptoms in the *E. wandoo* (Fig. 5) did not appear to show a similar seasonal colour response – any colour change was more a sign of fresh leaf growth during spring / summer. Aside from an increase in damage from Wandoo Crown Decline (WCD) in 2005, this tree appears to have recovered, as have other affected trees (Fig. 6).

Discussion

The site was initially inspected in 2003 for likely causes, but it was clear that the yellowing had been present for some months and so no physical signs of recent site disturbance were available to aid the diagnostic process. Dept. employees were questioned to determine if any herbicide application / spillage had occurred in the area but there was some uncertainty whether none had occurred or if it was outside their knowledge.

The site is adjacent to a residential area and has been disturbed by roading and dam construction. Herbicide dumping by a third party cannot be ruled out.

Whilst the yellowing leaf symptoms have some similarities with those described for MY in the literature, many of the other symptoms do not e.g. MY trees cease producing flowers and seed capsules, whereas these trees did produce buds (when not affected by WCD). The symptoms of MY progress through the crown, with the tree defoliating over several years, whereas in this instance, despite a succession of dry years and the occurrence of WCD, the trees recovered.

The symptoms also remained confined to the group of trees being observed – some symptoms were seen on adjacent trees in 2011, which, being downhill, lent some credence to the herbicide theory, but the symptoms were hard to observe in subsequent years.

Conclusion

The pattern of decline (and recovery) observed is different to that of MY, as well as differing from the normal symptoms associated with herbicide damage. There may be a range of possibilities e.g.

- MY has a wider range of symptoms and outcomes than previously thought
- herbicide damage can cause differing symptoms depending on the chemical used
- the cause of the symptoms is from an unknown source

However, after the amount of time elapsed it is highly unlikely that a conclusive answer will be found for this site. Importantly, the size of the affected area has not increased, no fresh symptoms have been observed, and there is abundant healthy new foliage growth. As the original concerns were of a MY occurrence, which now appears unlikely, it is recommended that the monitoring ceases and that this is the final report for the site.

References and further reading

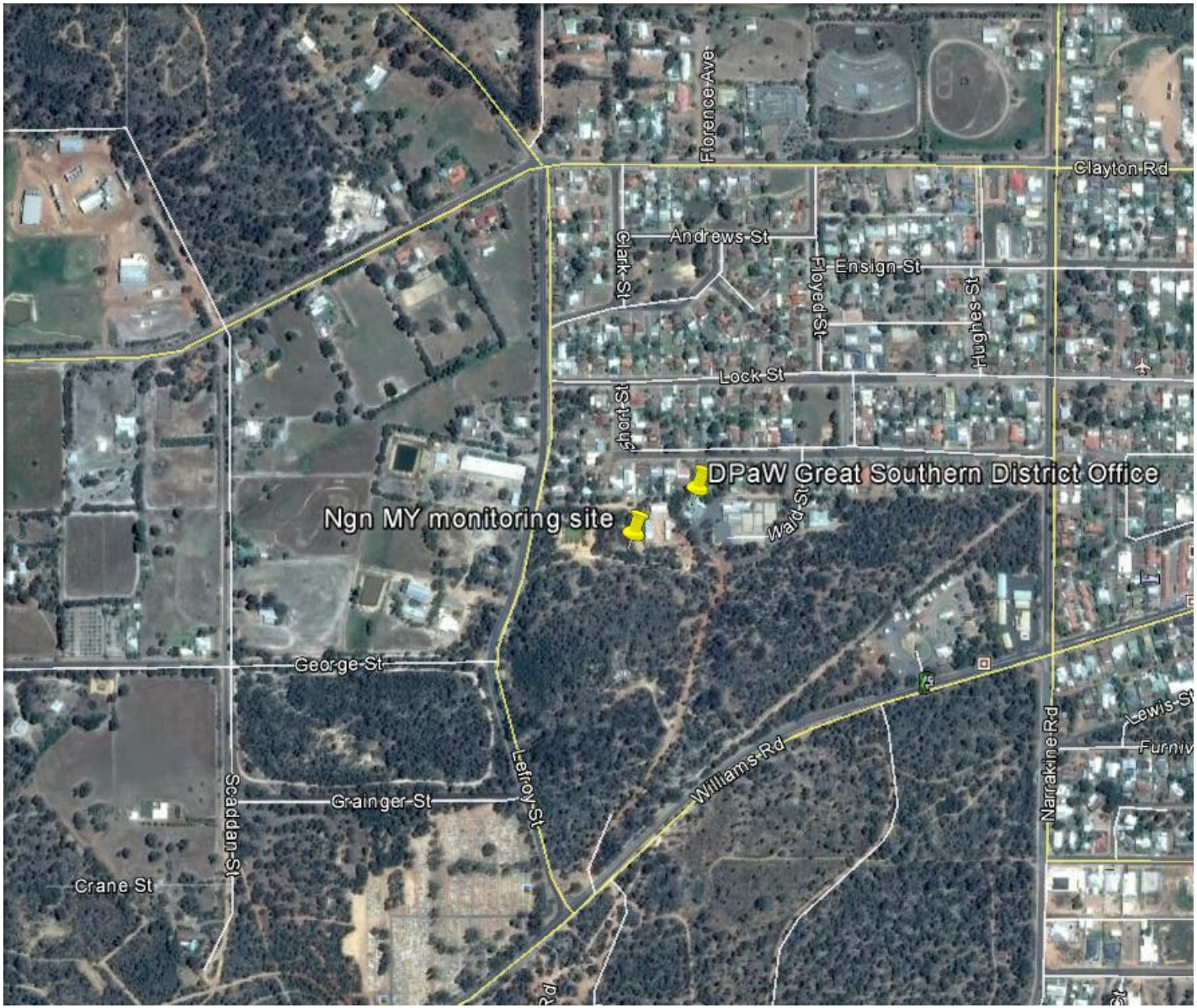
Australasian Plant Pathology, 2006, 35, 199–215. Mundulla Yellows disease of eucalypts: descriptors and preliminary studies on distribution and etiology D. Hanold, D. Gowanlock, M. J. C. Stukely, N. Habili and J. W. Randles

Hanold, D., Stukely, M., and Randles, J. R. Mundulla Yellows – a new tree-dieback threat. Landscope (Winter 2002) Dept. of Conservation and Land Management.

Image and document storage

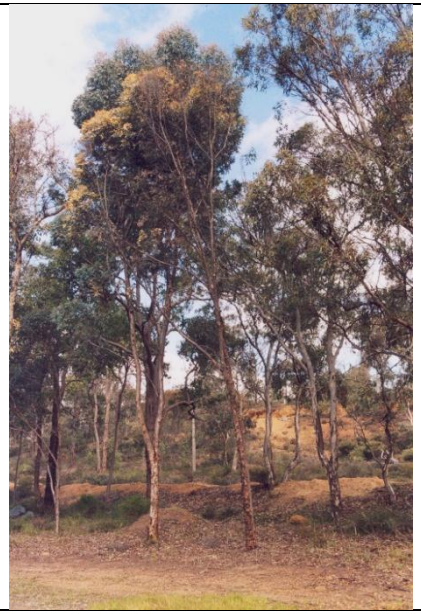
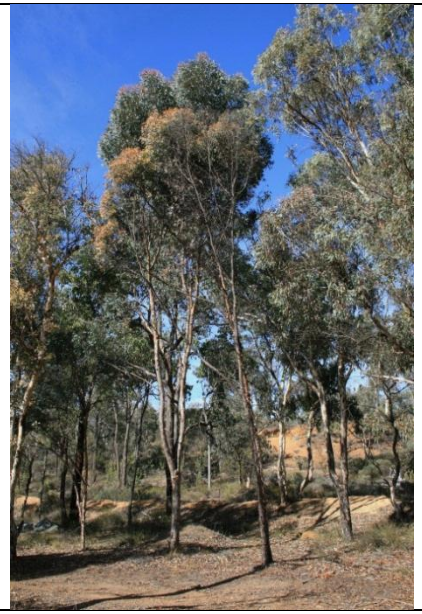
The images are stored on the Great Southern District T drive in the folder T:\407-Operations (District)\Shared Data\Nature Conservation report library\Plant diseases and weeds

Tree decline observations, Great Southern District vehicle compound, 2003 – 2014



Map 1. Location of MY monitoring site

Fig. 4 *Eucalyptus gardneri* 2003 - 2014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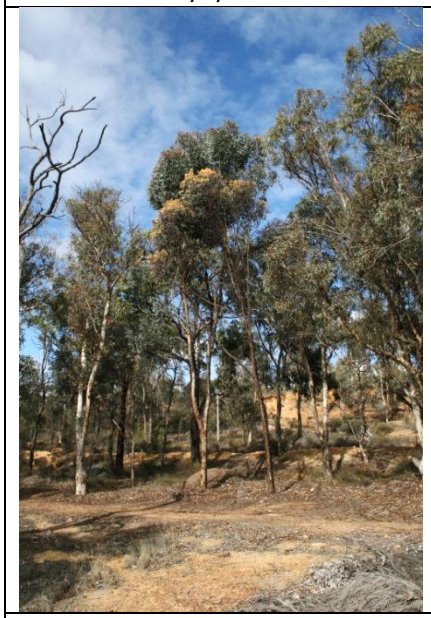			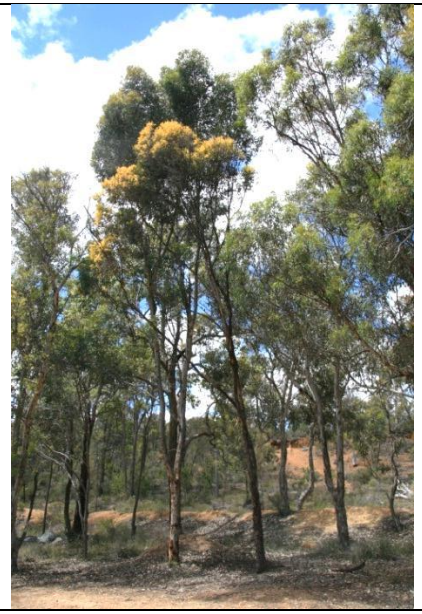
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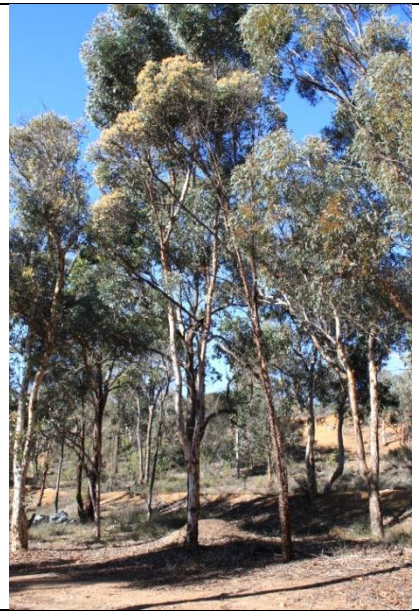
Fig. 4 *Eucalyptus gardneri* 2003 - 2014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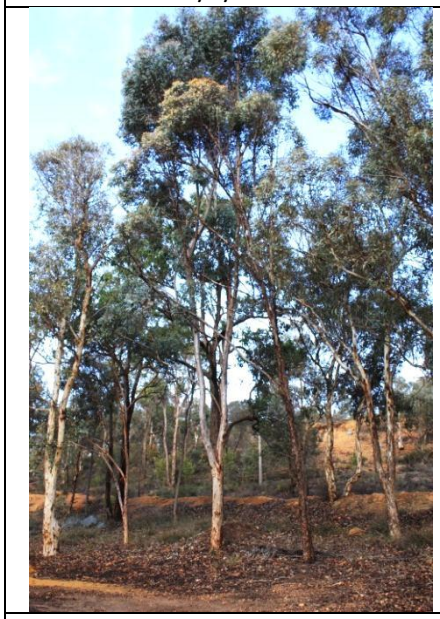	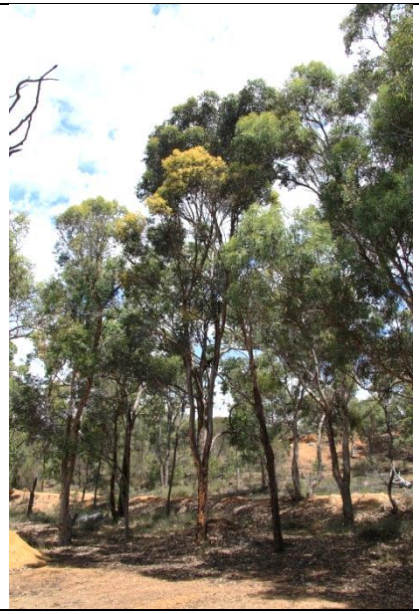	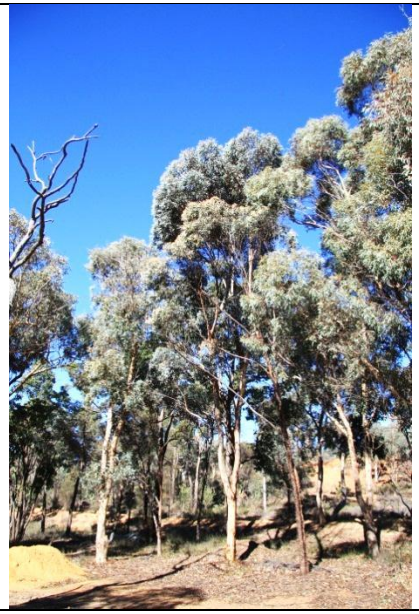	
15/6/2011	4/1/2012	18/6/2012	17/12/2012

Fig. 4 *Eucalyptus gardneri* 2003 - 2014

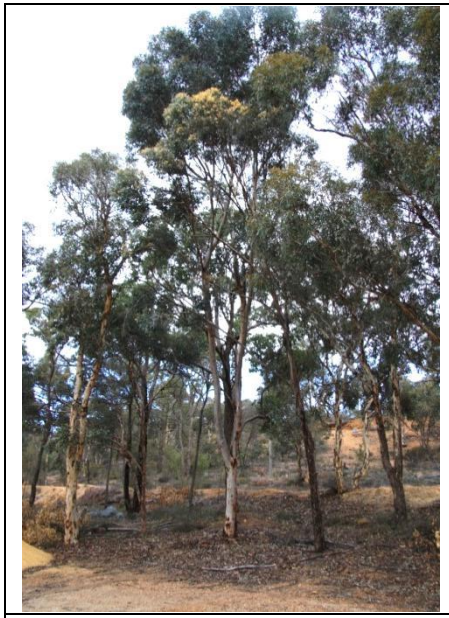	
14/6/2013	11/12/2013

Fig. 5 *Eucalyptus wandoo* 2003 - 2014

			
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		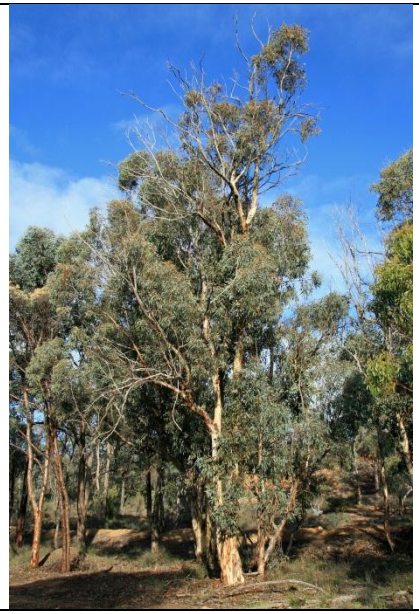	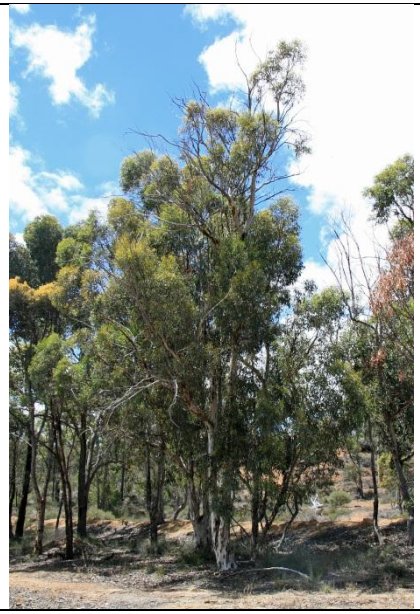
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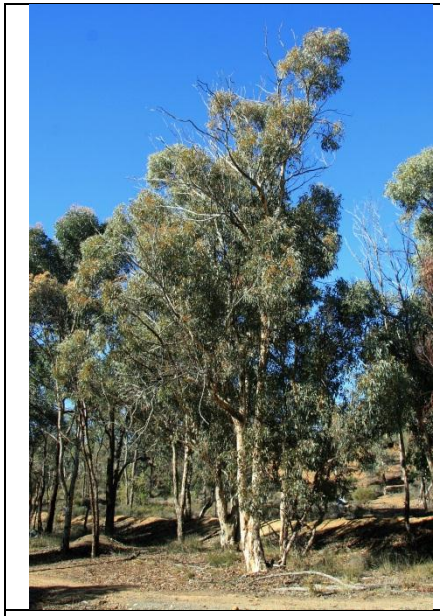
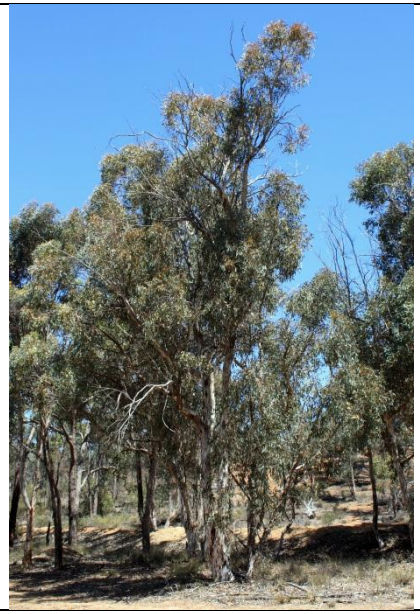
Fig. 5 *Eucalyptus wandoo* 2003 - 2014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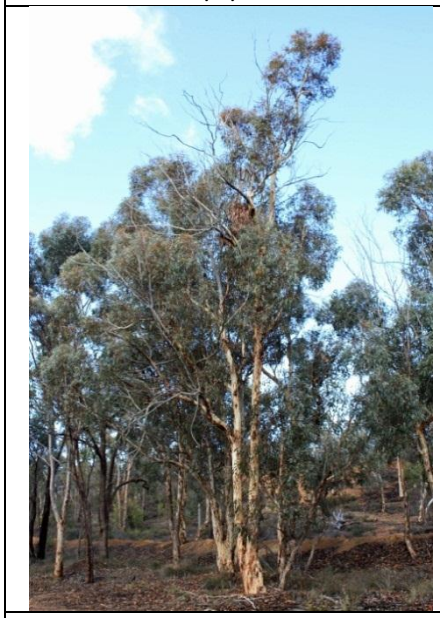			
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Fig. 5 *Eucalyptus wandoo* 2003 - 2014

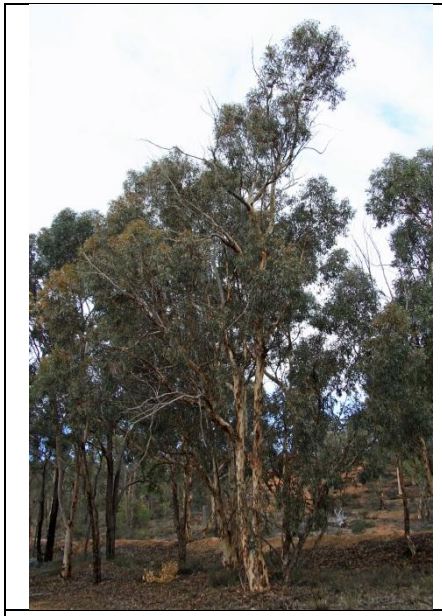			
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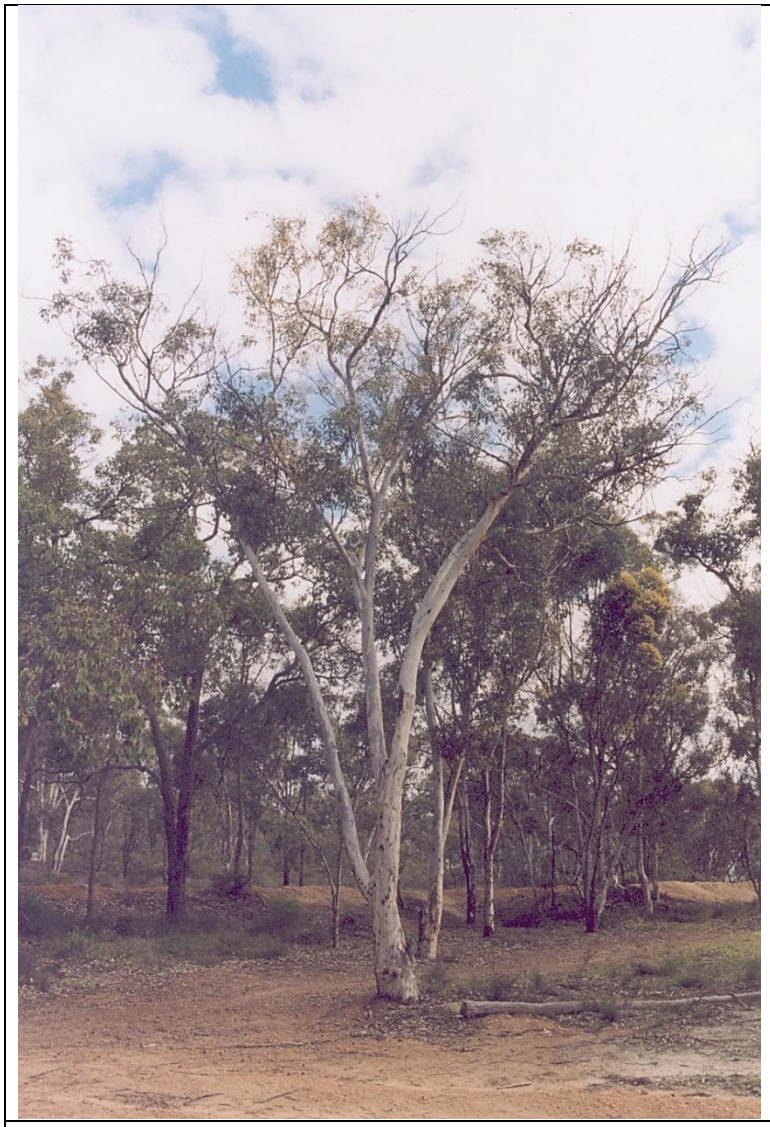
Fig. 6 *Eucalyptus wandoo*2003 - 2014



25/10/2005

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