

## COLLAPSE OF BULLICH (*E. megacarpa*) NEAR WHITE GUM ROAD IN SUMMER 2011

Frank Batini, revised April 2024.

### Introduction

The winter of 2010 was exceptionally dry and was followed by a long, hot summer. By March 2011 extensive crown scorch and some deaths of native vegetation occurred in the northern jarrah forest, especially in the western portion closer to the Scarp. The Water Corporation then funded an extensive aerial survey by helicopter over the Wungong research catchment with me as navigator. I estimated that about five percent of the forest on this catchment had been affected. It was obvious that most tree deaths were associated with shallow soils adjacent to exposed rock. A number of patch deaths were also observed in areas previously mined for bauxite which had been rehabilitated. One notable exception was an area of bullich (*E megacarpa*) on a streamline, near White gum road. The aerial survey was then followed up with field visits to eleven sites, six located in native forest and five on rehabilitated minesites.

### White gum road

June 2011     Site N2            This bullich site is located within Chandler Block, adjacent to White gum road and upstream of the original Chandler dam. The team included Dr E Davison (plant pathologist), Mr P Shedley and Mr F Batini (foresters) and Mr M Loh (Water Corporation engineer). N2 was described as a gully-head valley site with a dense stand of bullich, growing on a lateritic loam of depth > 80 cm. Most trees were dead but the understorey species were unaffected.

Occasional tree deaths had occurred previously and the area affected was estimated at one hectare. Basal area at a single site was measured as 26 m<sup>2</sup>/ha, stems per hectare as 300 and the girth of the largest tree as 1.60 meters. Site-vegetation type as a Havel C. The area had not been burnt for several years.

Adjacent and downstream of this site (at N3), in a comparable stand, the bullich was unaffected. There was no indication that tree deaths were associated with any pathogenic organisms. Drought was the most likely cause. It was expected that at least some trees would recover by producing epicormic or coppice shoots.

June 2020     Site N2            This site was re-visited by F Batini and J Clarke (foresters) and several criteria measured. The trees that were killed in 2011 had not produced epicormic shoots on the trunk or branches, but many had coppiced from the collar region and this coppice was now several meters tall. In addition there were many smaller stems that had germinated from seed. The area has not been burnt since 2011.

A transect 10 m wide 250 m long was established within the bullich stand moving upstream into the gully head and estimates of basal area ( factor 2 prism), stem numbers and crown

health ( by 10 cm size class increments) were made for all stems > 10 cm at breast height. The site is approximately one hectare (150m x 60m) in size. A total of 132 stems were assessed, of which 74 were alive and 64 dead. Basal areas and stems/ha recorded were 9 and 296 (alive) and 7.5 and 236 (dead). Most of the living stems (92%) were <30 cm at breast height, mainly coppice stems from trees which had died in 2011. Only 6 (or 20%) of the original mature trees (>30cm in 2011) were recorded as alive. The ratio of very healthy to very poor crowns was 1.5:1. More recent deaths of some younger stems were noted, probably as the result of a dry winter in 2019.

April 2024      Site N2              Winter rainfall in 2023 was fifteen percent below the ten-year average, summer 2024 was hot with several days above 40 degrees C, with very little rain since October 2023. This site was revisited and a scorch of crowns observed (Figure 3). It is too early to assess the full impact and further visits are planned. The bullich site at N3 remained unaffected.

## Discussion

The partial recovery of this stand of bullich since 2011 confirms that drought was the most probable cause of the original deaths. The effects have been substantial, killing most of the larger trees and replacing these with much younger coppice stems and seedlings. This new stand will now be much more susceptible to fire damage as the crowns are lower, the bark is thinner and there is much less seed in the young crowns. The site has not been burnt for at least 15 years. It is expected that most of the trees scorched in 2024 will also recover.

It is not clear why the bullich stand at N3, located immediately downslope of site N2, or the few scattered large bullich trees on slightly higher ground were able to survive in 2011 and 2024 and are still healthy. There are many other healthy bullich stands growing along streamlines within the Chandler catchment in 2024.

## Acknowledgement

Water Corporation for funding the helicopter and ground surveys in 2011. Mr John Clarke for assistance with the 2020 survey.

## Reference

Davison E (2011) tree deaths in native forest and rehabilitated minesites in the Wungong catchment. Report to Water Corporation 1 70443 720 9.



Figures 1 and 2- Photos of regrowth and dead stems of bullich at site N2 in 2020 (F Batini)



Figure 3- Regrowth from the 2011 drought event scorched in 2024. ( F Batini)