

What's Killing the Trees? An investigation of Eucalypt dieback in the Monaro region NSW

Catherine Ross

Dieback, the gradual decline in tree health often leading to death, has been identified as an increasing problem throughout Australia and the world. In the Monaro region of NSW, widespread decline of ribbon gums (*Eucalyptus viminalis*) has been occurring over the last 5 to 10 years, and almost all are now dying or dead. The dieback was found to cover an area of around 2000km² between Bredbo, Numeralla, Nimmitabel and Jindabyne; the boundaries are defined by a change in species composition, and it appears that the condition may have spread from a central location around Berridale.

The Monaro dieback has been linked to an outbreak of the eucalyptus weevil (*Gonipterus* sp.), a native to eastern Australia that has become a serious pest in overseas *Eucalyptus* plantations. In its natural habitat however, outbreaks are uncommon and rarely cause widespread damage. To investigate the underlying cause of this outbreak, I conducted a road survey and compared sites with different land uses and fire regimes. I also examined historical climate data to look for patterns or trends over the last 90 years.

Current theories suggest that dieback is the result of ecological simplification due to agricultural practices or a change in fire regimes. In this case, no relationship was found between dieback severity and land use, fire regime, or structural complexity attributes such as understorey density. Methods of managing dieback aimed at improving structural complexity are therefore unlikely to be successful.

The Monaro dieback appears to be related to climate; however the evidence is largely circumstantial and the mechanism that led to the eucalyptus weevil outbreak is still unclear. Over the last few decades, the region's climate has become warmer and drier, and the distribution of rainfall throughout the year has also changed. This may have an effect on the weevil's survival, reproduction and phenology, leading to an outbreak. White's Stress Index and the GROWEST Index also indicate that the climate has become increasingly stressful for the trees. The harsh climate of the Monaro is at the edge of the Ribbon Gums' climatic range, and the recent drought and changes in climate may have pushed the species beyond a critical threshold.

Under future climate change, it is possible that *E. viminalis* will disappear from the Monaro entirely, resulting in dramatic changes to the landscape and loss of biodiversity. Strategies for rehabilitation may include introducing species from more arid environments to accelerate adaptation to the changing climate.