Eucalypt Dieback on the Monaro, NSW
Based on research and honours thesis by Catherine Ross

Above: Severe dieback on Jindabyne Rd between Cooma and Berridale
Left: ANU Honours student Catherine Ross examining damaged foliage

Since around 2006/7, the Monaro region has been experiencing a steady decline in the health of eucalypts, in particular *Eucalyptus viminalis* or Ribbon Gum, the dominant species in the region. In this largely treeless landscape, the loss of these trees is of great concern to local landholders and land managers. Catherine Ross, an honours student at the Australian National University conducted a study with support from Greening Australia to investigate the extent and severity of the dieback and its possible causes.
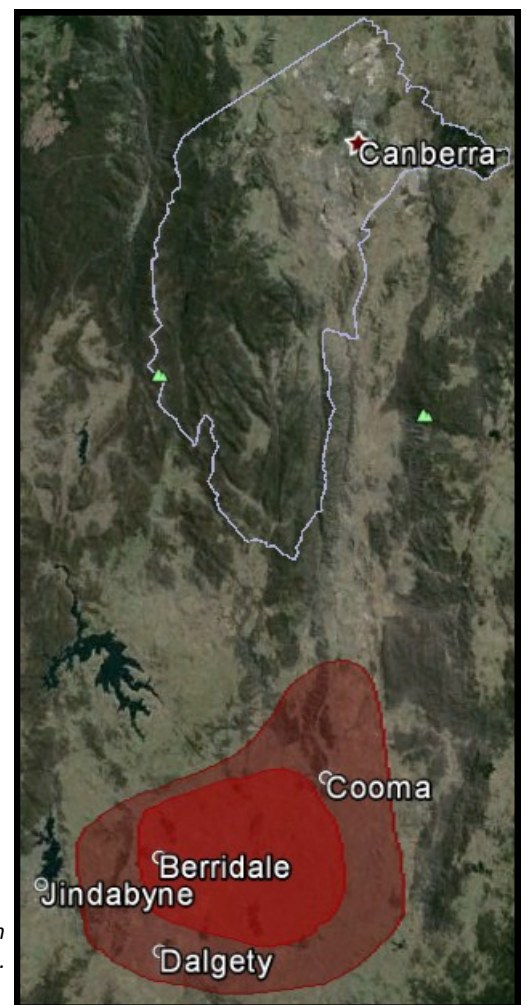
Extent and features of the Monaro dieback

The Monaro dieback covers an area around 2000 km^2, about the size of the ACT. Based on an extensive road survey, the map at right shows the affected area in light red, with the most severely affected central area between Cooma, Berridale and Dalgety, shown in dark red.

The dieback is specific to Ribbon Gums (*E. viminalis*) and to a lesser extent Candlebark (*E. rubida*), but does not affect other species such as Snow Gums (*E. pauciflora*) and Black Sallee (E. *stellulata*). The boundaries of the dieback are defined by changes in species composition to communities where Ribbon Gums are not present or are not as dominant.

Although dieback in rural landscapes is often linked to agricultural practices and land degradation, in this case both rural lands and reserves are equally affected, suggesting the cause may be on a much larger scale.

The dieback appears to be most severe in the centre of the affected area.

Causes of the Monaro dieback

Eucalyptus weevil (Gonipterus sp.) adult, larva and egg case.

The Eucalyptus Weevil

Dieback is often associated with insect outbreaks, which may occur when trees are under stress. The eucalyptus weevil (*Gonipterus sp.*) is responsible for repeatedly eating the leaves of Ribbon Gums in the Monaro region. The weevil is native to eastern Australia and has not been known to have outbreaks in Australia before, so there must be an underlying cause of the outbreak.

Drought and Climate Change

The climate of the Monaro region has low and unreliable rainfall and extreme temperatures limiting plant growth. In recent decades the Monaro has experienced one of the worst droughts on record, along with an unprecedented drop in autumn rainfall (see graph on right) and steadily increasing temperatures. These conditions are likely to cause tree stress and affect the interactions between insect populations and their predators and hosts.

Ribbon Gums are normally found in areas with higher rainfall, or in gullies and river valleys, and the Monaro is at the edge of their climatic range. Unfortunately, it is possible that with ongoing climate change the species will eventually disappear entirely from the region. The loss of this important species will result in a fundamental change to the Monaro landscape with serious consequences both environmentally and economically. Despite this bleak outlook, several options are available for land managers to rehabilitate affected areas.

Annual Rainfall Distribution at Berridale, NSW
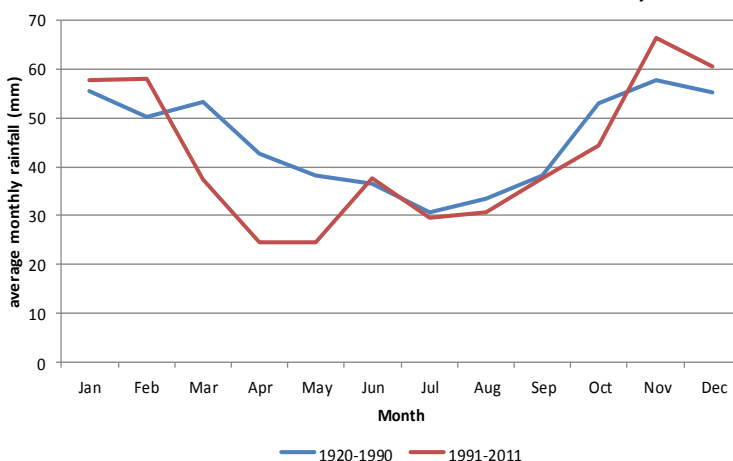
Rainfall distribution has shifted in the last few decades, with wetter summers and drier autumns

Management Recommendations

- **Stem injected pesticides** – '*SilvaShield*' has been used to protect trees from insect attack in the short term (4-5 years). Target valuable trees for seed production or habitat.
- **Replanting diverse native vegetation** – to replace missing trees and increase biodiversity and resilience.
- **Trial alternate species** – greater success may be achieved using species that are more resilient to insect attack and adapted to a warmer and drier climate. For example: Snow Gum, Candlebark, Apple Box, Yellow Box, Black Sallee.
- **Continue monitoring** – there are significant gaps in the current knowledge about the complex feedback and interactions between climate and ecosystems.

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