

## Response to Jurskis *et al.* (2006) — ‘Forest decline: should we manage or muddle?’ Who really is muddled?

From Phil Redpath

76 Victoria Street, Grafton, NSW 2460, Australia  
Email: Phil.Redpath@environment.nsw.gov.au

25 July 2008

Jurskis *et al.* (2006) provided a disparaging critique of research on forest decline by several Australian researchers published in *Australian Forestry* (Volume 68(4), 2005). The letter by Jurskis *et al.* (2006) requires a response concerning an important environmental threat facing Australian forests that has recently been preliminarily listed as a ‘Key Threatening Process’ under the New South Wales *Threatened Species Conservation Act 1995*. There is a need for a critical assessment of their arguments, which have recently appeared in various fora (e.g. Jurskis 2005b; Jurskis and Turner 2007; Jurskis and Underwood 2007). In particular, some of these arguments require scrutiny because they rely on non-empirical sources to support their case. In this letter I examine some of the arguments provided by Jurskis *et al.* (2006) to highlight shortcomings in their critique and emphasise the need for caution and trepidation when interpreting their publications.

Jurskis *et al.* (2006) begin their critique by stating that ‘*Dr Florence did not take the opportunity to resolve some contradictions, and instead reported something of a consensus and that there is not enough information and too much complexity.*’ They further state ‘*Thus essential and urgent actions have been delayed rather than encouraged.*’

The paper by Florence (2005) actually provides a well-referenced ‘ecological’ overview of some of the issues and circumstances that lead to forest dieback in different regions and ecosystems of Australia. A common thread through much of Florence’s reference-based discussion is the relationship between logging and or disturbance, fire, environmental stress, soil fertility, soil physical properties and water status, *Phytophthora*, ecosystem stability and the environmental gradients in which eucalypt forest occur and their relationship to dieback. Florence further discusses the relationship between the different subgenera of *Eucalyptus* and the soil fertility gradients and complex microbial environments that can limit their distribution or persistence.

Florence (2005) also briefly discusses the impacts of post-European disturbance, and reflects on the dramatic changes to forest structure (from old-growth to the highly disturbed at landscape scales) by logging and frequent high-intensity fire, and the consequences of those disturbances for forest health. Moreover, he discusses some of the issues surrounding bell-miner-associated dieback (BMAD) (see *Australian Forestry* 68(4), 2005), and asks a number of salient questions relating to the conditions and circumstances under which BMAD is likely

to occur. He also makes several suggestions for future research and systematic, state-wide rehabilitation programs. This overview provided a critical assessment of BMAD, reviewing both the data and proposing theories. There appear to be no contradictions in the review, and no-where has Florence indicated that there should be any delay in action(s).

Jurskis *et al.* (2006) also criticise Stone (2005), stating ‘*Stone’s suggestion that bellbirds cause plagues of psyllids is akin to suggestion that mouse plagues cause wheat farms.*’ This phraseology would suggest that Stone has leaped to extraordinary conclusions without the benefit of research or analysis of available data and peer-reviewed literature. Again, careful analysis of the researched and referenced information presented by Stone (2005) on the relationship between bell miners and psyllids provides a valuable summary of knowledge to that date. Stone established a strong, scientifically justified relationship between psyllid populations and the presence of bell miners. Stone’s rigorous and extensive experimentally-based research is well-regarded internationally. However, Jurskis *et al.* (2006) have provided only condescending criticism without data or any scientific analysis to refute Stone’s findings.

Jurskis *et al.* (2006) go on to state that ‘*Many types of forests and woodlands are dying whilst ecologists focus on local contributing factors [to BMAD], and ignore the obvious common threads.*’ Condemnation of scientists with views opposing those of Jurskis appears to be common-place in his papers, and this does not play a constructive role in deliberations concerning the significant challenges facing forest management. A similar request might be made to Jurskis *et al.* — ‘*can you scientifically justify and elucidate the obvious common threads?*’ — because analysis of Jurskis *et al.* (2006) and previous papers by Jurskis provide little empirical evidence to support all of their claims.

In an overview of a literature review provided to the BMAD Working Group (Wardell-Johnson *et al.* 2006), Wardell-Johnson *et al.* (2005) are also criticised for claiming ‘*there had been no attempt to unravel the various factors with some literature relying on anecdotal evidence and taking an advocacy approach.*’ While the meaning of this statement may seem unclear, the next lines suggest that Wardell-Johnson *et al.* (2005) somehow ‘*disparaged or ignored several of our [Jurskis] publications which have explicitly untangled these factors.*’ Yet again Jurskis *et al.* (2006) fail to provide any scientific evidence to support their argument. A

review of Jurskis and Turner (2002) and Jurskis (2004, 2005a,b) reveals significant limitations of approach. For example, there is no evidence of experimental design or data-based evidence to support the statements they make regarding BMAD. While some of the themes discussed by Jurskis in the aforementioned papers referring to BMAD have elements of logic, unless scientifically tested they are merely theories awaiting research.

Unfortunately, the letter by Jurskis *et al.* (2006) continues in a similar vein by presenting unsubstantiated views and unfounded arguments that are difficult to address in this short response, but the concerns expressed here about Jurskis' papers have also been raised by other authors (e.g. Benson and Redpath 2001; Florence 2001; Wardell-Johnson and Lynch 2005; Wardell-Johnson *et al.* 2005).

Wardell-Johnson and Lynch (2005) reviewed Jurskis and Turner's model for forest health decline. Their model is summarised by Wardell-Johnson *et al.* (2005) as: '*exclusion of low-intensity fire from eucalypt forests that evolved with fire leads to their progressive decline, and that any massive disturbance by wildfire is unlikely to regenerate these forests because insufficient seed will be available, and the weakened trees will be less able to re-sprout. They argue that intensive disturbance, such as clearing and plantation establishment, would be required to re-establish eucalypt ecosystems on sites where "mesic" dieback is well advanced*' and '*that monitoring of tree health after cutting and burning understorey vegetation in mesic dieback areas in the NSW coast could be used to test this model*' (Wardell-Johnson and Lynch 2005). These authors emphasise that Jurskis and Turner (2002) '*do not provide any data to allow validation or testing of the model presented,*' but note that Jurskis and Turner (2002) claim that '*validation of changed processes in forest soils and litter, as well as physiological changes in trees on dieback sites compared to healthy sites [would] confirm the model*'.

Jurskis *et al.* (2006) infer in their dialogue that burning, or lack thereof, is directly linked to changes in soil nutrient levels, but in making that inference fail to accurately link their theorem to that of Landsberg *et al.* (1990), or to any other available tested theory. Landsberg *et al.* (1990) set out to identify some of the conditions that may or may not limit dieback in remnant stands of woodlands in rural landscapes by '*measuring the contrasts between stands of trees having under-stories dominated by either pasture (heavy use by livestock) or by native shrubs and grasses (light use by livestock)*'. Landsberg *et al.* (1990) attributed their observations to the **redistribution** of nutrients by livestock. Jurskis *et al.* (2006) attribute, **without data**, soil nutrient increases to lack of fire.

Jurskis *et al.* (2006) then state: '*Empirical evidence includes observation and experimentation*', then proceed to dismiss current scientific thinking regarding the many complex issues surrounding forest decline and dieback by claiming that: '*There is enough empirical evidence to reject the conventional complex hypotheses of tree decline. Climate, stand structure/logging history or presence of native insects, pathogens or bellbirds cannot be primary factors in tree decline. Where these factors (as well as forest type, soil type, aspect and topography) do not vary across a cadastral boundary, differences in forest health on either side are undoubtedly due to different management*'. Jurskis *et al.* (2006)

give the impression that they have undertaken significant research and can refer to and or provide significant data that dismisses the work undertaken by scientists who have used scientific analysis and peer review to report their findings. They provide nothing in the way of evidence to support their claims, but rather refer to images of two highly disturbed fragments of native vegetation on roadsides to support their case.

In concluding, Jurskis *et al.* (2006) claim: '*Each individual component of our hypothesis is drawn from published experiments*', citing reference to Jurskis (2005b) and Turner and Lambert (2005). Unfortunately, they have neither identified their hypothesis in the letter, nor have they referred to the published experiments they use to support the undefined hypothesis. Jurskis *et al.* (2006) do make one concession in their letter; '*it is difficult to find "replicates" of stands that are susceptible to decline and have contrasting long-term management histories to experimentally demonstrate all the components in a single study*' and '*Frequently-burnt stands are rare*'. This observation seems to be at odds with previously quoted statements by Jurskis *et al.* (2006) throughout their letter which are best summarised by this quote: '*there is enough empirical evidence to reject the conventional complex hypotheses of tree decline*'.

It is unfortunate that Jurskis *et al.* (2006) are '*disappointed that two unbalanced "reviews" in our journal by Wardell-Johnson et al. (2005) and Wardell-Johnson and Lynch (2005), may encourage further muddling and hinder progress towards sustainable forest management*'. It is this author's belief that for forest management to improve in Australia, it is important that **no one** group of authors with a particular view should claim ownership over a journal at the expense of alternative views. The myopic view taken by Jurskis *et al.* (2006) will stifle and or impede a healthy direction for understanding and acting on the multitude of threats facing the forests of Australia. A continued repartee of verbal and personal attacks provides little value to resolving the complexity of issues causing eucalypt dieback and forest decline in Australian forests. I suggest that well-planned adaptive management trials and targeted scientific experiments are a better approach to critically tackling this particular issue.

## References

- Benson, J.S. and Redpath, P.A. (2001) Response to paper by V. Jurskis in Volume 63(3): Vegetation and fire. *Australian Forestry* 64, 64–66.
- Florence, R.G. (2001) Response to paper by V. Jurskis in Volume 63(3): Fire in the eucalypt forest. *Australian Forestry* 64, 66–67.
- Florence, R. (2005) Bell-miner-associated dieback: an ecological perspective. *Australian Forestry* 68, 263–266.
- Jurskis, V. (2004) *Observations of Eucalypt Decline in Temperate Australian Forests and Woodlands*. 2004 Gottstein Fellowship Report, Gottstein Trust, Melbourne.
- Jurskis, V. (2005a) Decline of eucalypt forests as a consequence of unnatural fire regimes. *Australian Forestry* 68, 257–262.
- Jurskis, V. (2005b) Eucalypt decline in Australia, and a general concept of tree decline and dieback. *Forest Ecology and Management* 215, 1–20.
- Jurskis, V. and Turner, J. (2002) Eucalypt dieback in eastern Australia: a simple model. *Australian Forestry* 65, 81–92.

- Jurskis, V. and Turner, J. (2007) In conservation's name. In: *Growing Forest Values*. Proceedings, Institute of Foresters of Australia and New Zealand Institute of Forestry Conference, Coffs Harbour, 3–7 June 2007, pp. 215–224. <http://www.forestry.org.au/news/templates/ifa-article.asp?articleid=939&zoneid=7>.
- Jurskis, V. and Underwood, R. (2007) Fire management: what has changed? In: *Growing Forest Values*. Proceedings, Institute of Foresters of Australia and New Zealand Institute of Forestry Conference, Coffs Harbour, 3–7 June 2007, pp. 225–232. <http://www.forestry.org.au/news/templates/ifa-article.asp?articleid=939&zoneid=7>
- Jurskis, V., Turner, J. and Lambert, M. (2006) Letter to the editor: Forest decline: should we manage or muddle? *Australian Forestry* **69**, 314–315.
- Landsberg, J., Morse, J. and Khanna, P. (1990) Tree dieback and insect dynamics in remnants of native woodlands on farms. *Proceedings of the Ecological Society of Australia* **16**, 149–165.
- Stone, C. (2005). Bell-miner-associated dieback at the tree crown scale: a multi-trophic process. *Australian Forestry* **68**, 237–241.
- Turner, J. and Lambert, M. (2005) Soil and nutrient processes related to eucalypt forest dieback. *Australian Forestry* **68**, 231–236.
- Wardell-Johnson, G. and Lynch, A.J. (2005) Landscape processes and eucalypt dieback associated with bell miner habitat in south-eastern Australia. *Australian Forestry* **68**, 242–250.
- Wardell-Johnson, G., Stone, C., Recher, H. and Lynch, A.J.J. (2005) A review of eucalypt dieback associated with bell miner habitat in south-eastern Australia. *Australian Forestry* **68**, 231–236.
- Wardell-Johnson, G., Stone, C., Recher, H. and Lynch, J. (2006) *Bell Miner Associated Dieback (BMAD) Independent Scientific Literature Review: A review of eucalypt dieback associated with bell miner habitat in north-eastern New South Wales, Australia*. NSW Department of Environment and Conservation Occasional Paper DEC 2006/116, 62 pp.