# For Whom the Bell Miners Toll

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2014

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**Summary**

This report looks at the issue of the Key Threatening Process 'Bell Miner Associated Dieback' (BMAD). This dieback has affected hundreds of thousands of hectares of NSW's forests from the Queensland border to the Victorian border. Millions of hectares of NSW's native forests are considered susceptible to this threat.

This report focuses on examples from the Border Ranges region in north east NSW.

Logging is implicated as the primary cause of BMAD. When the Forestry Corporation's management trials showed that their practices were making the problem worse they abandoned the trials and began targeting BMAD affected forests for intensified logging, in the full knowledge that the outcomes would be destroyed ecosystems.

Logging of BMAD affected forests is in contravention of the principles of Ecologically Sustainable Forest Management and thus the Forestry Act 2012 and Integrated Forestry Operations Approvals.

The costs of rehabilitating BMAD affected forests in the Border Ranges region is likely to already exceed $30 million, with costs rapidly increasing as the forests are further degraded.

Logging of BMAD affected and susceptible forests must stop until a sustainable solution to this problem is identified.

## Contents

# 1. Introduction

**Bellbirds**

By channels of coolness the echoes are calling,
And down the dim gorges I hear the creek falling:
It lives in the mountain where moss and the sedges
Touch with their beauty the banks and the ledges.
Through breaks of the cedar and sycamore bowers
Struggles the light that is love to the flowers;
And, softer than slumber, and sweeter than singing,
The notes of the bell-birds are running and ringing.

The silver-voiced bell birds, the darlings of daytime!
They sing in September their songs of the May-time;
When shadows wax strong, and the thunder bolts hurtle,
They hide with their fear in the leaves of the myrtle;
When rain and the sunbeams shine mingled together,
They start up like fairies that follow fair weather;
And straightway the hues of their feathers unfolden
Are the green and the purple, the blue and the golden.

October, the maiden of bright yellow tresses,
Loiters for love in these cool wildernesses;
Loiters, knee-deep, in the grasses, to listen,
Where dripping rocks gleam and the leafy pools glisten:
Then is the time when the water-moons splendid
Break with their gold, and are scattered or blended
Over the creeks, till the woodlands have warning
Of songs of the bell-bird and wings of the Morning.

Welcome as waters unkissed by the summers
Are the voices of bell-birds to the thirsty far-comers.
When fiery December sets foot in the forest,
And the need of the wayfarer presses the sorest,
Pent in the ridges for ever and ever
The bell-birds direct him to spring and to river,
With ring and with ripple, like runnels who torrents
Are toned by the pebbles and the leaves in the currents.

Often I sit, looking back to a childhood,
Mixt with the sights and the sounds of the wildwood,
Longing for power and the sweetness to fashion,
Lyrics with beats like the heart-beats of Passion; -
Songs interwoven of lights and of laughters
Borrowed from bell-birds in far forest-rafters;
So I might keep in the city and alleys
The beauty and strength of the deep mountain valleys:
Charming to slumber the pain of my losses
With glimpses of creeks and a vision of mosses.

Henry Kendall 1869

Henry Kendall was appointed inspector of state forests in 1881. Little did he realise that the "Bell-birds" (Bell Miners) he extolled would one day cause the degradation and death of the forests he eulogised at the hands of the agency he served. Now the "*notes of the bell-birds ... running and ringing"* are no longer confined to the "*spring and to river*" and are expanding throughout the landscape at an alarming rate. To many their calls no longer have connotations of *"the beauty and strength of the deep mountain valleys"* but rather of lantana understories and dying trees.

As tree canopies in wet eucalypt forest are opened up by logging, and the weed lantana spreads through the understory, Bell Miners thrive in the altered habitat. Their practice of "farming" tiny sap-sucking insects means their populations are also thriving, literally sucking the life out of vast swathes of eucalypts. Bell Miner Associated Dieback (BMAD) now occurs from Queensland through to Victoria.

Bell Miner Associated Dieback (BMAD) has affected hundreds of thousands of hectares of NSWs forests, including tens of thousands of hectares in the Border Ranges in north-east NSW, in severe cases leading to the death of trees and replacement by lantana. BMAD is recognised as a growing threat to millions of hectares of forests in north east NSW, it has been listed as a "Key Threatening Process" (KTP) and identified as affecting timber and water yields, as well as many plants and animals. It is most often associated with the invasion of forest understories by the weed Lantana (another KTP) following logging.

While the Forestry Corporation of NSW have been aware of the problem for over 70 years, and had abundant evidence that their miss-management is responsible for at least 20 years, they continue to

target BMAD affected and susceptible forests for logging, intentionally leaving destroyed ecosystems behind them.

The precautionary principle is a fundamental component of the concept of ecologically sustainable development (ESD) and has been defined in Principle 15 of the *Rio Declaration (1992):*

> *Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation*.

The lack of certainty about the significance of the various factors contributing to BMAD is used by both the Forestry Corporation and the Environment Protection Authority (EPA) as the excuse for continuing to justify the logging of BMAD affected and susceptible forests. This displays unabashed contempt for the precautionary principle.

NEFA have been actively pursuing the problem of BMAD since 1992, including through our involvement on the North East State Forests Harvesting Advisory Board (1996-8) and on the Bell Miner Associated Dieback Working Group since 2002. Through these processes we have achieved various studies and platitudes but no meaningful outcomes as the Forestry Corporation continue their failed practices, target BMAD affected forests for increased logging intensity, and facilitate the further spread of BMAD.

The Forestry Corporation have been undertaking sporadic studies and mapping exercises for BMAD since 1992, though have been refusing to implement agreements to map it as part of their harvest planning process since 1997. Management trials involving intensive understorey removal were undertaken in the Border Ranges region in 2005 and 2007 by the Forestry Corporation, though were only monitored for up to 2 years. It is now readily apparent that the trials were an abject failure, though the Forestry Corporation pretends they were successful and since at least 2009 have been targeting BMAD affected forests, including their supposed trial areas, for intensified logging without any pretence of rehabilitation.

The outcomes are increased dominance by lantana, expanding BMAD, destroyed ecosystems, and loss of habitat for an array of threatened species. Threatened Species Licence requirements for retention of habitat trees, understorey and exclusion areas for numerous threatened species are not being achieved. The Forestry Corporation know that increased degradation will be the outcome and thus are knowingly and wantonly destroying the forest.

That the Forestry Corporation commits their atrocities under the guise of Ecologically Sustainable Forest Management (ESFM) and a pretence of adaptive management is reprehensible. Given that ESFM is a fundamental legal obligation under the Forestry Act 2012 and the Integrated Forestry Operations Approvals (IFOAs) it is also illegal. Enough is enough. It is well past time that this intentional, wanton and illegal environmental vandalism is stopped.

The Forestry Corporation get away with this because the supposed regulatory agency, the EPA, refuse to enforce the IFOA's requirements for ESFM and turn a blind eye to BMAD, and are thus complicit in the destruction of forest ecosystems and threatened species habitat.

It has been apparent for many years that the invasion of logged areas by lantana is largely responsible for BMAD. It has been left to private landowners to prove that by controlling lantana the

Bell Miners can be controlled and forest health improved. There is an alternative to destroying the forest.

This report reviews the causes of Bell Miner Associated Dieback, its extent in NSW, the requirements of Ecologically Sustainable Forest Management, what is being done about BMAD, and recent trials and outcomes of logging BMAD affected forests in the Border Ranges region of north east NSW.

The conclusions of this review are:

**What causes Bell Miner Associated Dieback?**

Many factors contribute to Bell Miner Associated Dieback. We do know that BMAD is related to prolonged outbreaks of abundant psyllids, that high densities of Bell Miners facilitate high populations of psyllids, and that Bell Miners are advantaged by logging operations that create low dense understories of lantana, open midstories and sparse overstories. The solution to BMAD is to stop logging affected and susceptible forests and to rehabilitate affected areas to reduce their suitability for Bell Miners.

**How big is the problem?**

Over 100,000 hectares of forests in NSW are already affected by Bell Miner Associated Dieback and millions of hectares have been identified as potentially susceptible. Affected areas occur across all tenures, with many areas added to national parks as a result of the Regional Forest Agreement processes. To better understand and manage BMAD it is important that its current and potential extent is urgently mapped across the landscape.

**Ecologically Unsustainable Destruction**

Bell Miner Associated Dieback is a major threat to the sustainability of many forest ecosystems over large areas of NSW's wetter eucalypt forests. Undertaking activities that promote BMAD, and not restoring BMAD affected ecosystems to a healthy state, clearly contravenes the basic tenets of Ecologically Sustainable Forest Management, the Forestry Act, and Australia's national and international commitments. The significance of the problem has been recognized by both NSW and Commonwealth Governments for over a decade, and their failure to take action makes them knowingly complicit in this environmental crime.

**Inaction is Convenient but Deadly**

It has been shown that forests affected by Bell Miner Associated Dieback can be successfully rehabilitated simply by removing the weed lantana. Though because of the Forestry Corporation's intent to log affected and susceptible forests they continue with their failed management in order to liquidate the timber resources, in full knowledge that they are destroying native ecosystems and killing vast swathes of NSW's forests. Their apparent intent is to degrade the native ecosystems sufficiently to be able to justify converting them into plantations. They are knowingly killing native forests and are thus the worst kind of environmental vandals. They get away with this because the supposed regulators and politicians simply don't care.

**The Border Ranges Experience**

Tens of thousands of hectares of forest in the Border Ranges Region are affected by BMAD as forests are invaded by lantana and Bell Miners following logging. The outcome is increasing dominance by dead and dying trees. The local community has been requesting that the Forestry Corporation recognize the relationship of BMAD with logging and deal with the problem since at least 1993.

The Forestry Corporation has consistently refused directions to map BMAD in their harvesting plan process and develop rehabilitation strategies since 1997. Attempts to systematically map BMAD across the landscape were initiated then, though it was not until 2004 that the distribution of BMAD was mapped across the Border Ranges, even then many affected areas were unaccountably missed. Management trials in 2005 and 2007 proved that the Forestry Corporation's management was the problem, so they stopped monitoring the outcomes. Since then the Forestry Corporation have been targeting BMAD affected forests for intensive logging and intentionally leaving destroyed ecosystems behind.

The costs of rehabilitating BMAD affected forests in the Border Ranges region is likely to already exceed $30 million, with costs rapidly increasing as the forests are further degraded.

The Forestry Corporation's deliberate refusal to deal with BMAD in a responsible manner for over 20 years has resulted in its ongoing spread through the Border Ranges. They know what they are doing. That they are perpetuating the degradation and death of vast swathes of forest under the guise of Ecologically Sustainable Forest Management and the pretence of "Adaptive Management" is reprehensible. Their environmental vandalism must be stopped.

A sustainable response to Bell Miner Associated Dieback involves:

a. Identifying and mapping all affected and susceptible areas;
b. Placing all affected and susceptible areas under a logging moratorium until such time as appropriate management responses that restore ecosystem health and functioning are identified;
c. Undertaking rehabilitation works (i.e. lantana control) in affected stands; and,
d. Monitoring effects of any treatment and refining methods before repeating it.

**DONALDSON STATE FOREST**

Despite significant contributions of public money and commitments to undertake and monitor a 2005 BMAD management trial in Donaldson SF for 15 years, the Forestry Corporation only monitored the outcome for the first year before abandoning the trial and logging both trial and exclusion areas in 2009/11. So that the public money spent on the BMAD trials in Donaldson are not wasted it is important that those plots not compromised by the logging are reassessed to document the longer term effects of the treatments applied. Judging by the visual appearance of the area inspected rehabilitation efforts were an abject failure in controlling lantana, Bell Miners and BMAD, though some lessons should be able to be learnt from an independent review of updated data.

**MOUNT LINDESAY STATE FOREST**

It is now 7 years since the Forestry Corporation conducted their 2007 BMAD logging trials in Mount Lindesay SF, yet it appears they only monitored the outcomes for the first two of the 15 year trial. Their results proved the trials to be a failure and any improvements to be temporary. Seven years after the trials it is now obvious that the trials were a bigger failure than the Forestry Corporation were willing to admit, with the full extent of the failure expected to become more apparent in 15-25 years as the patchy regrowth becomes affected by BMAD and the wattles senesce. There is a large body of data collected over the past 17 years for Mount Lindesay State Forest that should be replicated and used to identify changes in the distribution, intensity and effects of BMAD over that time. In particular the 1997 forest health mapping should be repeated. This will enable the logging trials to be considered in context and for meaningful results to be obtained.

**YABBRA STATE FOREST**

As shown in Yabbra State Forest, the Forestry Corporation have been targeting BMAD affected forests for intensified logging without attempting any rehabilitation works in a manner that they know will promote lantana, Bell Miners and BMAD. While they now give token recognition to the existence of BMAD in their harvesting plans they still refuse to map its extent, refuse to acknowledge the presence of lantana or BMAD in their rehabilitation plans and refuse to undertake rehabilitation unless forced to. They do this because the EPA is complicit.

**CREEKS BEND**

The lantana control works on the private property at Creeks Bend provide strong evidence that a sustainable means of dealing with BMAD and restoring ecosystem health may be as simple as removing lantana in a manner that avoids intensive disturbance to native species and soils.

# 2. What causes Bell Miner Associated Dieback?

The “moist hardwood” forests have long been recognised as a management problem due to difficulty in achieving regeneration of the eucalypt component following logging as a result of competition from rainforest elements or weeds (e.g. van Loon 1966, Forestry Commission 1982, King 1985). The NSW Forestry Commission (1982) notes *“The Moist Coastal Hardwood types can be among the most difficult in the state to regenerate successfully. The dense rainforest understorey precludes hardwood regeneration without major disturbance; some of the most important species are relatively slow growing in their younger stages; weed growth after disturbance can be prolific and vigorous.”* The more developed the rainforest component, the harder it is to achieve eucalypt regeneration (i.e. Forestry Commission 1982).

State Forests (1995) identified moist hardwood forests as 'Potentially High Yielding, Difficult to Manage Forest', one of three categories (along with 'Low Wood-Yield Forest' and 'Geographically Remote Forest') for consideration for exclusion from the core productive forest estate on the basis that:

> *"Under the current restrictions that apply to logging intensity, many past and current areas of potentially high wood productivity such as moist hardwood and rainforest ecotone forest cannot be satisfactorily regenerated back to the same stand level of sclerophyll species following logging. Generally, the light logging practised in these forests has the effect of promoting either the mesophyll (rainforest) component or a viney, weedy component. Either way, the effect is one of reducing the sclerophyll component and lowering commercial productivity."*

Bell Miner Associated Dieback (BMAD) is an additional constraint to the successful management of these forest types. Serious consideration needs to be given to the wisdom of trying to continue to manage these forests for industrial logging.

The direct causes of BMAD are a variety of species of psyllids. Psyllids are small (usually <5 mm) aphid-like invertebrates, the nymphs of which suck sap directly out of leaves and cause defoliation. Continued feeding on the replacement foliage results in a continuing demand on the tree’s carbohydrate reserves, weakening the trees and making them more susceptible to secondary stresses such as wood borers and fungal decay (Stone 1999). The reduced vigour of the root system increases the tree’s susceptibility to soil fungal pathogens and moisture stress (Stone 1999).

For protection the psyllid nymphs secrete waxy or sugary coatings called lerps (e.g. Campbell and Moore 1943), which are important food sources for a range of other invertebrates, birds and arboreal mammals. Predation usually controls populations of psyllids. Though it has long been recognised that outbreaks of psyllids can occur in the presence of Bell Miners (i.e. Campbell and Moore 1943, Clarke and Schedvin 1999, Stone 1996;Stone 2005), and that the removal (Loyn et. al. 1983, Clarke and Schedvin 1999) or control (Stone 1996) of Bell Miners allows other predators to control the psyllids.

Bell Miners are thought to feed on other insect predators (i.e. Campbell and Moore 1943) and are known to aggressively exclude most other avian predators (i.e. Loyn et. al. 1983). Bell Miners exhibit aggressive interspecific territoriality, meaning that they co-operate in attacking or mobbing both potential competitors and nest predators to drive them from their colonies (i.e. Poiani 1991), resulting in *“almost total exclusion of all other avian species from the colony’s territory”* (Clarke and Fitz-Gerald 1994). Bell Miners also exhibit selective foraging behaviour when feeding on psyllids, frequently removing their lerp casings and leaving the nymphs behind intact, and are thus likely to

have a reduced impact on psyllids relative to other predators (Loyn et. al. 1983, Haythorpe and McDonald 2010).

Bell Miners appear to have a preference for a disrupted eucalypt canopy and low dense understories for nesting sites (Stone et. al. 1995, Stone 1999, Stone 2005, Haywood and Stone 2011), and a permanent source of water (Stone 1999). They like to build their nests about two metres above the ground (i.e. Clarke 1988). It is likely that an open midstorey better enables Bell Miners to control the site (Stone et. al. 1995). Bell miner colonies can occur in a range of eucalypt forest types but typically in mesic eucalypt forests and often on relatively fertile sites (Stone 2005).

On the north coast Bell Miners are strongly correlated with lantana (i.e. NSW Scientific Committee 2008, St.Clair 2009) though also occur where watervines smother regrowth. Lantana itself is a weed of national significance and a key threatening process. The NSW Scientific Committee note *"There is a strong correlation between Lantana establishment and disturbance ..., with critical factors being disturbance-mediated increases in light and available soil nutrients".* Lantana invasion is enhanced by the opening of the canopy by logging and by burning (i.e. Gentle and Duggin, 1997, Raizada and Raghubanshi 2010). As noted by Wardell-Johnson *et. al*. (2006) "*the proliferation of dominant understorey weeds, such as Lantana (Lantana camara), in the north-eastern region of NSW has largely been attributed to the disturbance caused by logging and associated activities".*

Raizada and Raghubanshi (2010) found that germination of the numerous lantana seeds that survive is enhanced along with seedling vigour by fires, commenting *"that the use of fire as a management option to control L.camara should be discouraged, because fire may result in encouraging, rather than in checking its spread".*

Jurskis and Walmsley (2012) consider that dieback primarily affects older trees (i.e. >30 years old), stating *"Species and site combinations that are predisposed to decline may remain healthy, despite inappropriate management, until stands reach the pole stage".*

The NSW Scientific Committee's (2008) final determination for listing 'Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners' as a Key Threatening Process notes that:

> *Broad-scale canopy dieback associated with psyllids and Bell Miners usually occurs in disturbed landscapes, and involves interactions between habitat fragmentation, logging, nutrient enrichment, altered fire regimes and weed-invasion (Wardell-Johnson et al. 2006). ... Over-abundant psyllid populations and Bell Miner colonies tend to be initiated in sites with high soil moisture and suitable tree species where tree canopy cover has been reduced by 35 – 65 % and which contain a dense understorey, often of Lantana camara.*

Stone *et. al.* (1995) found that *"The vast majority of plots (97%) had been exposed to some degree of logging and were on their second or third rotations ... A possible long-term explanation of why the dieback problem may be increasing, is that the proportion of moist sclerophyll forest being exposed to selective logging is increasing throughout the State."*

Wardell-Johnson *et. al*. (2006) identify that many authors who have studied BMAD have identified logging as a cause, noting:

> *Hence, logging operations may be both implicated in the development of BMAD, and affected by changes in yield induced by BMAD. Nevertheless, the literature remains very*

*limited concerning the impacts of logging and associated disturbance on the initiation or development of BMAD.*

Based on her research for the Forestry Corporation and review of the literature, Stone (1999) put forward a conceptual model for BMAD:

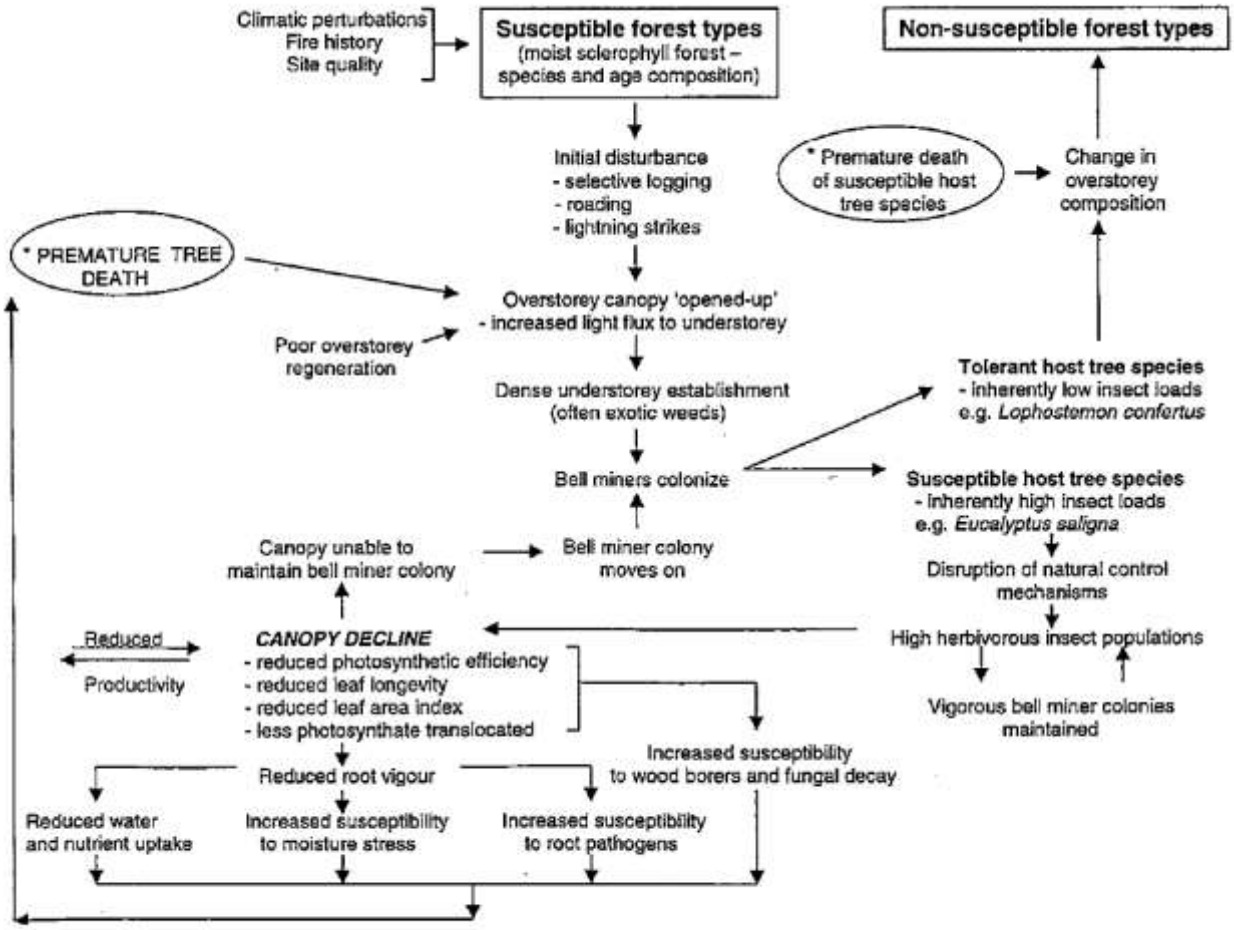



**Figure 1.** A conceptual model illustrating possible relationships and several feedback loops between processes which may contribute to canopy dieback associated with bell miners in moist eucalypt forests.

Kavanagh and Stanton (2003) in their assessment of logged and unlogged coupes over 22 years near Eden, considered that the increase in Bell Miners in moist forest types at the heads of two gullies in logged coupes *"provides support for the hypothesis (Stone 1999) that logging disturbance can be a contributing factor in creating the habitat conditions required by the Bell Miner"*.

Others in the Forestry Corporation have been attempting to discredit Stone's work and confuse the issue. This has been led by Vick Jurskis who asserts that the BMAD problem is the result of reduced frequency of burning causing eucalypt decline (Jurskis and Turner 2002, Jurskis 2004, Florence 2005, Jurskis and Walmsley 2012). Despite limited evidence this approach has been effective in confusing the issue and stopping needed action.

This theory of rainforest invasion due to reduced burning (i.e. Florence 2005) has driven the Forestry Corporation's failed silvicultural approach to the management of "wet sclerophyll" forest for the past century. Their simplistic approach of blaming natural processes rather than their own miss-management is part of the problem. On the north coast of NSW lantana is invading the logged "wet

sclerophyll" forests, the more intensive and frequent the disturbance the more lantana is favoured. As a management tool fire is of limited use in "wet sclerophyll" forest. In stands with a naturally grassy understorey occasional fires can control lantana, though as the past 100 years prove it is not a successful means of managing sites that naturally have a low fire frequency and rainforest understory. Logging and burning simply promote lantana in these forests.

Jurskis' (Jurskis and Turner 2002) wanting to restore natural fire regimes may have some effect in controlling lantana in drier open forests, though he, and his co-author John Turner, ignore the fact that the evidence is that pre-European fires were relatively infrequent in wet forests on the north coast. Carbon dating of charcoal and wood in the catchment at the head of Terania Creek established that the frequency of fire (with sufficient severity to result in the production of charcoal) was estimated to be 300 years in the blackbutt forest, 300–400 years in the brushbox forest and in excess of 1000 years in the rainforest (Turner 1984). Under Forestry Corporation management logging and fire frequency is measured in decades (or less) not centuries.

The basis of Jurskis' hypothesis is that a reduced fire frequency causes changes in soil chemistry that affects the eucalypts, with Psyllids and Bell Miners simply being symptoms rather than causes. Investigations into this have basically found that BMAD occurrence is related to increasing soil fertility and moisture (Stone 2006, Mews 2008) which also corresponds to the wet sclerophyll forests Bell Miners prefer. The limited and equivocal evidence of leaf litter and some nutrient increases on affected sites may be due to feedback loops associated with the changes in understorey and crown foliage associated with BMAD (i.e. Mews 2008). Jurskis' theory is unsubstantiated conjecture, which has been shown to fail in practice.

To make the facts fit the theory Jurskis and Walmsley (2012) seem to imply that BMAD is not a problem in wet sclerophyll forests, stating *"The wet sclerophyll forests are naturally adapted to high intensity fires at intervals of several centuries and remain healthy over this period whereas the naturally grassy forests are predisposed to decline in the absence of frequent low intensity fire"*.

Florence (2005) also emphasised the "struggle" between eucalypt and rainforest as a fundamental factor in BMAD, basically concluding, as has been apparent for many decades, that such forests are not suitable for the management they are being subject to:

> *Where destabilised by post-settlement fire and logging, changes in ecosystem processes may have exposed the limits of the eucalypts' capacity to cope with soils with consistently high levels of available nutrients.*

It is recognised that stress may be a factor involved in the proliferation of BMAD and that BMAD becomes worse during periods of low rainfall (i.e. Stone 2005, Jurskis and Walmsley 2012). This suggests that global warming, with its increasing temperatures, skyrocketing evaporation and intensifying droughts is likely to be a major contributor to increasing BMAD.

**Many factors contribute to Bell Miner Associated Dieback. We do know that BMAD is related to prolonged outbreaks of abundant psyllids, that high densities of Bell Miners facilitate high populations of psyllids, and that Bell Miners are advantaged by logging operations that create low dense understories of lantana, open midstories and sparse overstories. The solution to BMAD is to stop logging affected and susceptible forests and to rehabilitate affected areas to reduce their suitability for Bell Miners.**

# 3. How big is the problem?

> *The severity of the BMAD problem is such that tens of thousands of hectares in north-eastern NSW is currently affected with over 2.5 million hectares considered potentially vulnerable (Ron Billyard pers comm., Nov. 2004). A substantial (although uncertain) area of south-eastern Queensland is similarly affected, although less attention has been directed there. BMAD occurs on both public and private land and the area affected is expanding rapidly. The severe impact of this form of forest canopy dieback has profound implications for the conservation of the internationally significant biodiversity of the region.*
>
> Wardell-Johnson *et. al.* (2006)

The Forestry Corporation recognised dieback associated with psyllids as a significant problem in north-east NSW in the 1940s (Campbell and Moore 1943). Stands of Sydney Blue Gum were reported as dying during the period 1949 to 1958, *"the increasing numbers of deaths reaching economic significance toward the end of that period"* (Moore 1959). The two areas assessed by Moore showed 55% and 59% of trees as dead or expected to die. Moore (1959) hypothesised that *"the abnormal rainfall adversely affected the physiology of* Eucalyptus *and other species generally, making them susceptible to heavy attack by psyllids*." Bird *et. al.* (1975) report Moore (1962) as finding that *"there were more than 150 separate occurrences of variable extent up to 1,500 ha."*

Then Wyong District Forester, Charlie Mackowski (pers. comm.), noted that field work in the early 1990's had delineated 5,000 hectares of "Bellbird Dieback" on State Forests in the then Wyong District.

In 1995 the Forestry Corporation (Stone et. al. 1995) identified significant areas of dieback in the Morisset, Bulahdelah, Gloucester, Taree, Wauchope, Kempsey, Walcha and Urbenville Districts. Stone *et. al.* (1995) found that the affected areas range in size from 1 ha to nearly 100 hectares, with the Sydney Blue Gum league of forest types (FT no's 46, 49, 53 and 54) most affected and the grey ironbark/grey gum league (FT 60) second most affected.

Stone *et. al.* (1995) notes *"More recently, District staff have reported that affected areas are increasing in size and that previously unaffected areas are developing symptoms."* Stone *et. al.* (1995) concluded that:

> *"A possible long-term explanation of why the dieback problem may be increasing, is that the proportion of moist sclerophyll forest being exposed to selective logging is increasing throughout the State.*

In 1996 the Urbenville District Forester, Paul Sharpe (pers comm., 1996) estimated that there was in the order of 5,000 hectares affected by "Bellbird Dieback" in the then Urbenville Management Area. In 2004 the Forestry Corporation identified almost 20,000 hectares of the approximately 100,000 hectares of apparently susceptible forest types in Urbenville Management Area as being affected by dieback attributed to BMAD.

Jurskis and Turner (2002) emphasise the extent of the problem in NSW:

> *In Bega Valley Shire, on the south coast of New South Wales, every near-coastal drainage system contains bellbird dieback (Appendix 1). Personal observations over several years indicate that dieback areas are expanding.... Incidental observations suggest that the problem extends along the entire New South Wales coast.*

Jurskis and Walmsley (2012) elaborate on the parlous state of forests on the south coast:

> *In 2001 Jurskis and Turner (2002 Appendix 1) recorded observations of eucalypt decline in each coastal drainage system within Bega Valley Shire. Six hours of helicopter survey in 2002 identified 10,000 hectares of declining forest in three coastal regions. In the Eden Region, Jaggers (2004) estimated that roughly 20% of about a half a million hectares of forest appeared to be declining and a further 10% consisted of types that are prone to decline, in young stands that were below the age when decline becomes apparent. Limited sampling in the Batemans Bay Region during a drought in 2002 indicated that about 28% of State forests were stressed (Forests NSW unpublished data).*

Wardell-Johnson *et. al.* (2006) state:

> *The severity of the BMAD problem is such that tens of thousands of hectares in north-eastern NSW is currently affected with over 2.5 million hectares considered potentially vulnerable (Ron Billyard pers comm., Nov. 2004). A substantial (although uncertain) area of south-eastern Queensland is similarly affected, although less attention has been directed there. BMAD occurs on both public and private land and the area affected is expanding rapidly. The severe impact of this form of forest canopy dieback has profound implications for the conservation of the internationally significant biodiversity of the region.*

Jurskis and Walmsley (2012) estimated the area of forest in NSW susceptible to dieback by assuming that within different regions dieback was limited to specific geologies. Given the subjective nature of the assessment and the numerous assumptions relied upon it is of questionable accuracy, particularly as significant areas of BMAD have been recorded on geologies they discounted. Jurskis and Walmsley (2012) assessment of extent should be regarded as conservative. They note:

> *We estimated that 790,000 hectares, about 18% of the total area, of forests and woodlands in our study area may be predisposed to decline if managed inappropriately. About half the area is private land and half is in conservation reserves and multiple use forests.*

In the Jilby area Haywood and Stone (2011) undertook trial mapping of BMAD using plot data, lidar data, GIS data and computer modelling to identify both stands which are actually colonised by bell miners and stands which are susceptible to colonisation by bell miners. Such mapping provides a rational basis for exploring the relationships between variables and BMAD as well as mapping its extent across the landscape. This mapping should be extended across the forest estate.

The Forestry Corporation's silviculturalist Florence (2005) emphasised the need for urgent research and rehabilitation:

> *There are substantial areas of highly disturbed (inadequately stocked) interface (wet sclerophyll) forest along the east coast of Australia (Florence 2005), much of which may be vulnerable to BMAD. If we are to truly embrace environmental conservation, state-wide research and rehabilitation programs are both essential and urgent*

**Over 100,000 hectares of forests in NSW are already affected by Bell Miner Associated Dieback and millions of hectares have been identified as potentially susceptible. Affected areas occur across all tenures, with many areas added to national parks as a result of the Regional Forest Agreement processes. To better understand and manage BMAD it is important that its current and potential extent is urgently mapped across the landscape.**

# 4. Ecologically Unsustainable Destruction.

> MATHIAS. The Bells! the Bells again! ...
>
> CHRISTIAN. I am sure of it. There are so many ways of detecting criminals, and so few escape, that to have committed a crime like this, and yet to remain undiscovered, showed the possession of extraordinary address.
>
> ...
>
> MATHIAS. The Bells! The Bells!
>
> CATHERINE. Are you mad?
>
> MATHIAS. Ring on! Ring on! Houp! Houp!
>
> ...
>
> PRESIDENT. You knew well the time to select; you knew well how to evade all suspicion; you knew well how to destroy all direct evidence. You are a dangerous man!
>
> MATHIAS (*derisively*). Because nothing can be proved against me I am dangerous! Every honest man then is dangerous when nothing can be proved against him! A rare encouragement for honesty!
>
> PRESIDENT. The public voice accuses you. Answer me this; how is it that you heal the noise of Bells?
>
> MATHIAS (*passionately*). I do not heal the noise of Bells!
>
> PRESIDENT. Prisoner, you speak falsely. At this moment you hear that noise. Tell us why is this?
>
> MATHIAS. It is nothing. It is simply a jangling in my ears.
>
> PRESIDENT. Unless you acknowledge the true cause of this noise you hear, we shall summon the Mesmerist to explain the matter to us.
>
> **Leopold Lewis. The play 'The bells' (1871)**

Bell Miner Associated Dieback (BMAD) is a major threat to the ecological sustainability of vast areas of NSW's forests. Over thousands of hectares of wet-sclerophyll forests eucalypts are either dead or too sick to grow, flower and set seed, once diverse and complex rainforest understories have been taken over by the introduced lantana, and an array of native animals are being displaced due to habitat degradation and mobbing by Bell Miners. This is ecosystem collapse.

On public lands wet sclerophyll forest ecosystems are being destroyed under the guise of Ecologically Sustainable Forest Management with subsidies from NSW taxpayers. This is being perpetuated in full knowledge of the consequences. The continued logging of BMAD affected forests is state sponsored environmental vandalism and is clearly contrary to the basic precepts of the Ecologically Sustainable Development that Australia, NSW and the Forestry Corporation have committed themselves to.

The Commonwealth Government (CoA 1990) identified five general principles of ecologically sustainable development:

- *Integrating economic and environmental goals in policies and activities*
- *Ensuring that environmental assets are appropriately valued*
- *Providing for equity within and between generations*
- *Dealing cautiously with risk and irreversibility*
- *Recognizing the global dimension*

The ESD Working Group on Forest Use (CoA 1991) concluded:

> *The principles of ecologically sustainable forest use will require the development of a policy framework and approaches which recognise three requirements:*

- *maintaining ecological processes within the forests;*
- *maintaining biodiversity; and*
- *optimising benefits to the community from all uses within ecological constraints.*

The ESD Working Group on Forest Use (CoA 1991) also noted that:

> *"The protection of biodiversity and the maintenance of ecological systems and processes underpins economic activity. Thus, by taking an ecologically sustainable approach to development, all species, their genetic diversity and their habitats would be conserved such that the natural processes of evolution and ecosystem functioning can continue forever. This requires a recognition that there are fundamental biophysical limits to natural resource use."*

The United Nations Conference on Environment and Development, having met at Rio de Janeiro from 3 to 14 June 1992, and working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system, identified 27 principles including:

> **Principle 4**
> *In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*
> ...
> **Principle 8**
> *To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production ...*
> ...
> **Principle 15**
> *In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*

*The 1992 National Strategy for Ecologically Sustainable Development was* endorsed by the Council of Australian Governments in December, 1992. It has as its goal "*Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends"* and includes as a core objective *"to protect biological diversity and maintain essential ecological processes and life-support systems".* The objectives for Forest Resource Use and Management include:

- *to manage and utilise Australia's forest estate for all forest values on an ecologically sustainable basis*
- *to maintain ecological processes within the forests, maintain biodiversity, and optimise benefits to the community from all uses, within ecological constraints (*includes*: address biological threats to forests)*

The 1992 National Forest Policy Statement adopts as the basis for ecologically sustainable development the Ecologically Sustainable Development Working Group on Forest Use's three requirements:

> *"…maintaining the ecological processes within forests (the formation of soil, energy flows, and the carbon, nutrient and water cycles); maintaining the biological diversity within forests; and optimising the benefits to the community from all uses within ecological constraints."*

The Forestry Act 2012 identifies that one of the principal objectives of the Forestry Corporation is to:

> *1(c) where its activities affect the environment, to conduct its operations in compliance with the principles of ecologically sustainable development contained in section 6 (2) of the Protection of the Environment Administration Act 1991 ,*

Section 6(2) of the *Protection of the Environment Administration Act 1991* states (in part):

> *... Ecologically sustainable development can be achieved through the implementation of the following principles and programs:*
>
> > *(a) the precautionary principle-namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*
> > *In the application of the precautionary principle, public and private decisions should be guided by:*
> >
> > > *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
> > > *(ii) an assessment of the risk-weighted consequences of various options,*
> >
> > *(b) inter-generational equity-namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
> >
> > *(c) conservation of biological diversity and ecological integrity-namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

The Forestry Corporation claims to have implemented a number of mechanisms so that they *"can assure the people of NSW that all of the forests are managed sustainably".* Ecologically Sustainable Forest Management Plans prescribe the management of State Forests in terms of the Forestry Act 2012 and are thus legal documents. For example the ESFM Plan for the Upper North East (Forests NSW 2005) commits that the Forestry Corporation (Forests NSW) *"will maintain or enhance the health and productivity of forests"* and:

- *Use adaptive forest management, which modifies the level of forest use and the nature and intensity of operations to manage site-specific natural heritage values within a regulatory framework (see Forestry Operations);*
- *Maintain forest health by active management including appropriate use of fire, control of pests and ensuring regeneration (see Forest Health);*
- *Ensure forest use is conducted in such a manner to maintain habitats for threatened species and safeguard ecological processes.*

The ESFM Plan for the Upper North East (Forests NSW 2005) states clearly that *"Forests NSW will use adaptive management processes to ensure forestry operations are ecologically sustainable".* Adaptive management is described by Whelan (2002):

> *Adaptive management is a* ***structured process of experimental management*** *(Walters 1997). It offers the opportunity of 'learning by doing', thus permitting management (or resource exploitation) to go ahead, initially without sufficient scientific knowledge, in a way that generates the knowledge. Management is expected to be modified in response to the acquisition and interpretation of the new information.*

Unfortunately the Forestry Corporation fail to monitor properly, refuse to learn from their mistakes and refuse to modify their management. There is no genuine commitment to adaptive management.

The Integrated Forestry Operations Approval (IFOA) also clearly gives the Forestry Corporation a legal obligation to implement ESFM. It is equally clear that the Forestry Corporation's undertaking of activities that promote BMAD is in contravention of their legal obligations. The IFOA (2.7.1) requires that in carrying out forestry operations "*SFNSW must give effect to the principles of ecologically sustainable forest management as set out in Chapter 3 of the document entitled, "ESFM Group Technical Framework"*.

Principle 1 of the ESFM Group Technical Framework is: *Maintain or increase the full suite of forest values for present and future generations across the NSW native forest estate.* Relevant specific criteria are:

***3.2.1.2 The productive capacity and sustainability of forest ecosystems***

- *maintain ecological processes within forests (such as the formation of soil, energy flows and the carbon, nutrient and water cycles, fauna and flora communities and their interactions);*
- *maintain or increase the ability of forest ecosystems to produce biomass whether utilised by society or as part of nutrient and energy cycles;*
- *ensure the rate of removal of any forest products is consistent with ecologically sustainable levels;*
- *ensure the effects of activities/disturbances which threaten forests, forest health or forest values are without impact, or limited.*

***3.2.1.3 Forest ecosystem health and vitality***

- *…*
- *ensure the effects of activities/disturbances within forests, their scale and intensity, including their cumulative effects are controlled and are benign;*
- *restore and maintain the suite of attributes (ecological condition, species composition and structure of native forests) where forest health and vitality have been degraded.*

The IFOA (4.26) also requires:

> *SFNSW must ensure that the scale and intensity at which it carries out, or authorises the carrying out of, forest products operations in any part of the Upper North East Region, does not hinder the sustained ecological viability of the relevant species of tree, shrub or other vegetation within the part.*

The Commonwealth Government, NSW Government and the Forestry Corporation are well aware of the BMAD problem and its significance. They cannot claim ignorance, they know what they are doing.

The Bell Miner Associated Dieback Working Group (BMADWG 2004), with its Government representatives, recognises that:

> *Impacts on forest productivity can be severe. Dieback defoliates the crown, ultimately leading to the death of standing trees. Not only do the standing trees die, but the lack of foliage and flowering and subsequent fruiting, reduce and eventually eliminate the seed production necessary for forest regeneration. Dense understorey development (primarily Lantana weed invasion in northern NSW and Cissus in the south) continues with little overstorey and reduced alternative species competition. Reduced eucalypt flowering directly impacts on honey production and on bird species and populations that compete with Bell miners.*

*Impacts of BMAD on private lands are significant, as these areas are critical to the livelihoods and well being of local communities. Forest woodlots and timber supplies, honey production, shelter belts and forest-related lifestyles are under threat from BMAD.*

*Local economies may also be impacted through declining forest tourism as dieback reduces the value, significance and aesthetic appeal of the forests.*

The State and Commonwealth reviews of the Regional Forest Agreement (RFA) recognize the significance of BMAD. The seriousness of BMAD is stated in the NSW & CoA (2009) 5 year review of the RFA:

*The resultant cycle of tree stress commonly causes the eventual death of forest stands, and serious ecosystem decline. In NSW the potential impact of BMAD-induced native vegetation dieback represents a serious threat to sclerophyll forest communities, particularly wet sclerophyll forests, from Queensland to the Victorian border. The forests most susceptible to dieback are those dominated by Dunn's white gum (Eucalyptus dunnii), Sydney blue gum (E. saligna), flooded gum (E. grandis) and grey ironbark (E. siderophloia). There is also evidence that some normally non-susceptible dry sclerophyll types may be affected when dieback is extreme. Current estimates place the potential at-risk areas at a minimum of approximately two and a half million hectares across both public and private land tenures in NSW.*

*BMAD is emerging as a pressing forest management issue in both the UNE and LNE regions. The potential impacts include:*

- *degradation of sclerophyll forest ecosystems across the UNE and LNE*
- *reduction in diversity and abundance of threatened flora and fauna species including Dunn's white gum and rufous bettong*
- *increased weed invasion and associated displacement of native forest species.*

*Dieback-affected areas are located in the catchments of the major rivers of the North Coast of NSW including the Tweed, Richmond, Clarence, Macleay and Hastings. Maintenance of water quality in these river systems is critically dependent on maintenance of healthy forest cover over the catchment uplands. Bell miner associated dieback has the potential to degrade these forests, and consequently impact negatively on rivers and catchment communities through increased sediment and nutrient loads, and increased frequency and intensity of flooding.*

The 2003/4 FA implementation report (NSW Government 2007) and DECCW (2010) echo these concerns and identify BMAD as *"a serious threat to sclerophyll forest communities, particularly wet sclerophyll forests".* The NSW&CoA (2009) 5 year RFA review identifies that BMAD *"is of prime concern in the northern forest regions of the state".*

Forests NSW's (2005) ESFM Plan recognises BMAD as a problem, though misrepresents the processes, causes and extent:

*Chronic decline occurs when long term environmental changes, as a result of human management, impair tree health. It is increasing throughout dry and moist eucalypt forests, particularly in coastal areas. Approximately 20,000 ha of forest within UNE Region, including about 6,000 ha on State forest is showing signs of decline while a larger area of forest throughout the region is thought to be susceptible.*

> …
> *Declining forests are susceptible to invasion by exotic weeds such as lantana because unhealthy trees are weak competitors, and the weeds are better adapted to changed soil conditions that make the trees unhealthy.*

To intentionally destroy ecosystems is an environmental crime and a breach of the Forestry Act and Integrated Forestry Operations Approvals. There is no excuse for the NSW and Commonwealth Governments' refusal to meet their national and international obligations to manage ecosystems on an ecologically sustainable basis. They are not innocents, they are aiding and abetting a crime.

**Bell Miner Associated Dieback is a major threat to the sustainability of many forest ecosystems over large areas of NSW's wetter eucalypt forests. Undertaking activities that promote BMAD, and not restoring BMAD affected ecosystems to a healthy state, clearly contravenes the basic tenets of Ecologically Sustainable Forest Management, the Forestry Act, and Australia's national and international commitments. The significance of the problem has been recognized by both NSW and Commonwealth Governments for over a decade, and their failure to take action makes them knowingly complicit in this environmental crime.**

**BMAD AFFECTED FOREST (AND WETLAND) LOGGED ON THE BASIS OF ESFM AFTER THE FORESTRY CORPORATION HAD UNDERTAKEN THEIR ADAPTIVE MANAGEMENT TRIALS. THERE WERE ALSO REQUIREMENTS FOR 50% CANOPY RETENTION, PROTECTION OF A VARIETY OF HABITAT TREES, MINIMISING UNDERSTOREY DISTURBANCE AND BUFFERING WETLANDS. YABBRA STATE FOREST 2009.**

# 5. Inaction is Convenient but Deadly

*We are a national group of scientists, land managers, landholders, environmental consultants and community representatives drawn together to address the Australia-wide issue of Bell miner Associated Dieback (BMAD) in eucalypt forests.*

*We state without reservation that BMAD is a problem of national significance on an immense scale. It has vital consequences for timber production, forests resources and national parks, private lands, water catchments and water supply, biodiversity conservation and local and regional employment and community health.*

*...*

*We ask, indeed implore, Federal and State governments to support scientists, research institutions, land management agencies and forest owners, including those of public forests, with funding, personnel and policy and legislative support to enable the complex factors causing and sustaining dieback to be discovered and for control and prevention options to be explored and applied.*

*We, the undersigned, respectfully request your immediate attention to the enormous threat of Bell miner Associated Dieback in Australia's eucalypt forests.*

**A unanimous resolution of the Bell miner Associated Dieback (BMAD) National Forum, Proceedings. BMAD Working Group (2005)**

The Forestry Corporation has recognised dieback associated with psyllids as a significant problem in north-east NSW since at least the 1940s (Campbell and Moore 1943), which is apparently expanding rapidly, aided and abetted by the Forestry Corporation's logging and burning of affected and susceptible stands. The Forestry Corporation are part of the problem, not the solution.

The North East Forest Alliance has been pursuing the issue of Bell Miner Associated Dieback for over twenty years. We tried to get it addressed in the Environmental Impact Statements prepared in the early 1990s. This was a major issue we pursued when we were on the North East State Forests Harvesting Advisory Board in 1996/8. We unsuccessfully attempted to have this issue dealt with in the Comprehensive Regional Assessment process, particularly as a component of Ecologically Sustainable Forest Management. We have been involved with the BMAD Working Group since 2000.

While we recognise that we have made some progress over that time in assessing and documenting the problem, the condition of the forests has continued to decline, and despite our best endeavours the Forestry Corporation are continuing to ignore and compound the problem in their logging operations.

The most fundamental requirements are to identify the extent and severity of BMAD across the landscape, and most particularly within areas proposed for logging. Mapping of areas infested with weeds or suffering from dieback should be a fundamental requirement of responsible forest management. It is required in order to track the spread or contraction of the problem over time and to target areas for rehabilitation works.

It is outrageous that after all these years we still have only patchy ad-hoc mapping of BMAD, that the Forestry Corporation still refuse to map or rehabilitate BMAD affected areas as part of their

harvest planning process, and that the Forestry Corporation are still logging affected areas in a manner that they know exasperates the problems.

In the early 1990's NEFA made numerous submissions to the NSW Government, particularly regarding Forestry Corporation Environmental Impact Statements, where we highlighted the problem of BMAD. For example Pugh (1992) states:

> *A further problem exists where regrowth, particularly Sydney Blue Gum, is killed by heavy infestations of psyllids, facilitated by the aggressive Bell Miners excluding other birds (which would otherwise control the psyllids) from such heavily disturbed areas (e.g Loyn 1985). Significant areas are now comprised of a sea of lantana overtopped by dead trunks. As forests infested with lantana are picked over for remaining big trees the weed spreads.*

NEFA represented conservation interests on the North East State Forests Harvesting Advisory Board from 1996-8, covering the then Murwillumbah, Casino and Urbenville Management Areas. NEFA proposed that key performance measures for the NESFHAB should include "*Effective management practices to reduce bellbird dieback*" and "*Extent of bell bird dieback and lantana*", as well as requesting the mapping of Bellbird dieback in harvesting plans. The Forestry Corporation continually delayed NESFHAB agreements to map BMAD affected forests as part of harvesting plans on the grounds that they did not have sufficient resources to do the work.

While on the NESFHAB, NEFA supported (including by contributing volunteer labour) a BMAD mapping trial in Mount Lindesay State Forest on the understanding that the intent was to use the trial as the basis for mapping BMAD across NSW. The project aimed to use Digital Multi-Spectral Video (DMSV) to quantify the extent and degree of canopy dieback in a 10,000 ha study area centred on Mount Lindesay, with the aim to be able to later use map comparisons *"to determine the stability of bellminer colonies, rate of spread of the dieback, make predictions on future spatial patterns and directions of the dieback across the landscape and confirm the stand risk criteria"*. Despite costing around $100,000 it seems the outputs of this project relating to BMAD were simply discarded and not followed up. They were not referred to by St. Clair (2009) despite covering the same area.

NEFA also obtained the support of the NESFHAB for the preparation of a draft Operational Management Plan and Rehabilitation Strategy for BMAD affected areas. The proposal put forward by the Forestry Corporation (Sharpe 1997), after discussion in the NESFHAB, involved undertaking large scale rehabilitation of severely affected areas, and as part of the Harvesting Plan process mapping areas affected (by class), identifying proposed management (including excluding logging from areas *"if it is decided that harvesting will further exacerbate the problem and that rehabilitation works are either impractical or unlikely to succeed"*) and details of specific remedial works.

The Forestry Corporation's plan for large scale rehabilitation was to effectively convert BMAD affected areas to plantations of non endemic species, for site preparation proposing (Sharpe 1997):

> *Undertake "salvage" harvesting of any merchantable timber.*
> *Undertake the felling of dead and dying mature and overmature trees. This would amount to clear cull falling ...*
> *Undertake rough heaping of debris and subsequently burning it.*
> *Undertake wheel tractor or dozer mounted boom spraying of lantana understorey using roundup.*

Regarding concerns that this was basically converting native forests to plantations, Sharpe (1997) stated:

> *Random planting limits, if not precludes, the ability to economically and practically control the understorey amid the seedlings. Planting in rows facilitates economic weed management and ... has a higher chance of success.*
>
> *...*
>
> *The prospect of planting non endemic, non susceptible, species has come under attack from various quarters as being "unnatural" or "an attempt to create a plantation by stealth" ...*
>
> *...*
>
> *Because of the high cost, there may be an expectation of future harvest guarantee and there would be under the TP(HG) Act. Any of the strategies mooted thus far would satisfy accreditation of the area as plantation under the TP(HG) Act.*
>
> *The "plantation" option in its various forms meets the first part of our objective and, experience has shown, the greatest chance of success. ...*

The draft Operational Management Plan and Rehabilitation Strategy for BMAD affected areas progressed no further. NEFA particularly objected to proposed logging of severely affected BMAD stands in Mount Lindesay SF and proposals to plant them with Blackbutt which did not naturally occur in the area. The NESFHAB was disbanded in 1998 without any further progress and the Forestry Corporation abandoned any intent to redress the BMAD problem in their planning processes.

According to Jim Morrison (pers. comm. 2010) the BMAD Working Group's attempts to get Forests NSW to map and respond to BMAD in the harvest planning process has been similarly frustrated:

> *The BMADWG has for a number of years requested that FNSW record simple data about the presence of Bell Miners and or associated dieback on its harvest plans as they are prepared. Systematic, simple BMAD identification procedures urgently need to be made a mandatory part of the harvest planning process. This could be done when ecological surveys are undertaken, and also by the harvesting forester and be required to be reported just like any other threat identified in logging compartments. In fact the continued refusal of Forest NSW to undertake this simple task requested by the BMADWG only heighten suspicion that Forest NSW don't want to reveal the full extent of the problem across its estate.*

Forests NSW's (2005) ESFM Plan identifies BMAD as a significant problem, claiming:

> *In UNE Region; Forests NSW is collaborating with other agencies, universities, landholders and conservation groups through the Bell Miner Associated Dieback Working Group in the coordination of efforts to better manage chronic decline. The group has identified key actions that need to be undertaken to develop effective management measures including surveying and assessing the extent of decline, supporting independent literature review, lantana removal trials, guidelines for restoration of affected areas and promotion of the issue.*

The Bell Miner Associated Dieback Working Group (BMADWG 2004) has identified key actions that they consider need to be undertaken in order to develop effective management measures for BMAD. They do not address logging directly, though include "*Developing guidelines for restoration of dieback affected sites which may be implemented by landholders and government agencies*".

The Bell Miner Associated Dieback Working Group (BMADWG 2004) identifies Forests NSW's claimed approach:

> *Consistent with the EFSM requirements FNSW are preparing Regional Forest Health Management Plans as part of the Native Forest Health Management Strategy. The current management intent is to integrate native forest harvesting with trials to reduce the spread of dieback into open forests by use of frequent low intensity fire and to trial rehabilitation methods for dieback affected areas.*

The Forestry Corporation apparently never prepared their management plans and strategies, preferring instead to undertake failed logging trials in some areas while targeting others for "maximum economic utilisation" with no rehabilitation while trying to pretend that BMAD is not an issue. Rather than promoting the issue, the Forestry Corporation have been promoting the problem.

The BMADWG working group organised a national forum at Southern Cross University in 2005. The Bell Miner Associated Dieback National Forum focussed on the need for undertaking trials of various management options and the implementation of adaptive management. Eight themes were developed in the initial sessions of the Forum. Five of these themes fcussed on ground trials, and management of forest understories was a major component of all.

There have been a number of trials that have established that direct control of Bell Miners can in turn control psyllids and improve forest health (Loyn et. al. 1983, Clarke and Schedvin 1999). The relationship between Bell Miner dominance and the dominance of forest understories by lantana has also been known for a long time. It is therefore self-evident that by controlling lantana it may be possible to control Bell Miners and thus psyllids.

Stone (2005) states:

> *If bell miners are responsible for a breakdown in the top-down processes maintaining the insect herbivore populations at non-damaging levels, then management options could concentrate on reducing or removing at least one of the habitat factors favoured by bell miners.*

Wardell-Johnson *et. al.* (2006) concluded:

> *...It may be appropriate for management to prevent the creation of habitat that is preferred by the Bell miner, as such habitat will also facilitate the primary cause of eucalypt dieback. However, to attempt such management intervention in isolation from an understanding of both the processes and the behaviour of Bell miners under different levels of disturbance may compound the problem.*

From his work in Donaldson and elsewhere in the region, Mews (2008) observed *"It is apparent that there is reluctance by NSW government to deal with this phenomenon and to recognise the linkages between BMAD and poor management practices".* He concluded:

> *There is evidence that bottom up factors such as soil nutrients, physical and structural properties play an important role in allowing or encouraging BMAD to occur and these processes. However it will most likely be easier to influence populations of* M. melanophrys *in most cases by physical manipulation of their habitat rather than the soil directly"*.

In 2005 the BMAD Working Group determined to undertake trials of lantana control on private property at 'Creeks Bend' on Ironpot Creek, Donaldson State Forest and at Sheepstation Creek in Border Ranges National Park, to test the hypothesis that:

> *The removal of the dense understorey in areas affected by BMAD will make the habitat less suitable for Bell Miners. This will break the birds' dominance of the site, allowing other bird species that prey on psyllids to invade the area and consume the invertebrates. This will put an end to the dieback, resulting in healthy forest canopy species.*

The trials are discussed in the Border Ranges Experience. In summary the heavy handed approach of the Forestry Corporation failed to control either lantana or BMAD, instead resulting in their spread, whereas a more sympathetic approach applied at Creeks Bend appears to have been successful in controlling both lantana and BMAD.

For years the Forestry Corporation have been effective in intentionally creating doubt about the causative factors of BMAD to enable them to go on logging affected and susceptible stands. While some foresters have been highlighting the issues, others maintain the pretence that logging, lantana and Bell Miners have nothing to do with BMAD and that all the Forestry Corporation needs to do is increase burning of affected and susceptible stands (i.e. Jurskis and Walmsley 2012). The Corporation itself has found denial that logging has anything to do with BMAD a convenient lie. This has been effective in stopping the urgent action required.

The NSW Scientific Committee's (2008) final determination for listing 'Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners' notes that

> *8. Due to the complex interaction between factors that have been altered as a consequence of landscape-level disturbance, there is at present no obvious means of arresting the threat presented by 'Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners'. Moreover, expert opinion varies considerably as to which factors are causes of dieback and which factors are effects. Broad-scale research and adaptive management are required to understand how to best manage this threatening process, to prevent its expansion throughout forests of eastern New South Wales.*

This uncertainty fostered by the Forestry Corporation has allowed them to continue to log and degrade affected stands rather than rehabilitating them. It is astounding that Government agencies can go on undertaking activities known to contribute to BMAD on the grounds of lack of scientific certainty. This is a perversion of the precautionary principle.

Conservation groups have been advocating a precautionary approach since the early 1990s. In 2003 the NSW Nature Conservation Council Annual Conference unanimously passed the resolution:

> *'that there should be no further logging in BMAD affected forests or those at high risk of developing BMAD until the causes of the problem are better understood and an acceptable, sustainable management plan is developed to restore the health of these forests'.*

In 2005 the Primary Industries Minister, Ian Macdonald MLC, rejected calls by the North East Forest Alliance and North Coast Environment Council representatives on the BMADWG working group for a logging moratorium on eucalypt forests suffering and at risk of Bell Miner Associated Dieback.

In recent years NEFA have included lengthy sections on BMAD in its submissions to the 2011 Federal "Inquiry into the Australian forestry industry", the 2012 Federal Inquiry into "The effectiveness of threatened species and ecological communities' protection in Australia" and the 2012 NSW Upper House "Inquiry into the Management of Public Land in New South Wales",

regrettably this issue has been ignored in all the discussions and recommendations from these committees. Politicians of all persuasions seem intent on ignoring the issue of BMAD.

NEFA have been trying for years to get the Environmental Protection Authority to take action on this issue and to stop the Forestry Corporation from targeting BMAD affected and susceptible stands for logging, and to rehabilitate areas after logging. BMAD has been specifically identified in NEFA reports and audits of logging in Yabbra (2009), Royal Camp (2012), Koreelah (2013), Richmond Range (2014) and Donaldson (2014) State Forests. The EPA has repeatedly refused to do anything about it. The chair of the BMAD working group took the EPA's CEO Barry Buffier on a tour of BMAD rehabilitation sites in 2013.

For Yabbra SF compartments 164&165 the EPA (Smith 19/5/10) refused to do anything on the grounds that *"there is inadequate information available to determine if Bell Miner populations and Bell Miner associated Dieback has been favoured by these logging and burning operations"*. For Richmond Range SF compartments 327&328 the harvesting plan states *"The health of the stand is being affected by Bell Miner Associated Dieback"*, yet in response to our complaints the EPA (Steve Hartley 16/4/14) acknowledged the problem but claimed *"EPA officers did not observe Bell Miner Associated Dieback"*, and flagged it as an issue for *"ongoing work".*

NEFA have appealed to the Forestry Corporation's CEO Nick Roberts, shown him the consequences of logging these areas on the ground in Yabbra State Forest in 2010 and 2012, and pleaded with him to map and exclude from logging BMAD affected forests in Koreelah State Forest, again to no avail.

**It has been shown that forests affected by Bell Miner Associated Dieback can be successfully rehabilitated simply by removing the weed lantana. Though because of the Forestry Corporation's intent to log affected and susceptible forests they continue with their failed management in order to liquidate the timber resources, in full knowledge that they are destroying native ecosystems and killing vast swathes of NSW's forests. Their apparent intent is to degrade the native ecosystems sufficiently to be able to justify converting them into plantations. They are knowingly killing native forests and are thus the worst kind of environmental vandals. They get away with this because the supposed regulators and politicians simply don't care.**

# 6. The Border Ranges Experience

***P**erchance, he for whom this bell tolls may be so ill, as that he knows not it tolls for him; and perchance I may think myself so much better than I am, as that they who are about me, and see my state, may have caused it to toll for me, and I know not that.*

John Donne, Devotions upon Emergent Occasions (1623)

The Border Ranges Region considered herein is limited to the western part associated with the Focal Peak volcano, as it is this area that has extensive dieback and has been the focus of research. It encompasses the NSW side of the NSW-Queensland Border which runs along the McPherson Range, and the ranges running south from it, chiefly the Richmond, Capeen, Koreelah and part of the Great Dividing Ranges. The ranges were formed from 25-20 million years ago by the eruptions associated with the Focal Peak volcano. Between these ranges the volcanic rocks have been eroded by the headwaters of the Richmond and Clarence Rivers eating away the flanks of the volcano to expose the sedimentary rocks of the Clarence-Moreton Basin.

In general the richer volcanic soils of the ranges support rainforests and wet-sclerophyll forests with rainforest understories, giving way to dry sclerophyll forests, often with grassy understories, on the sedimentary soils. Around the 1840's loggers began to search the rainforests for Red Cedars and graziers moved into the open forests of the valleys. The early 1900s saw the establishment of sawmills to mill a range of rainforest species, with this expanding to include eucalypt timbers in the 1930s. Logging intensity has progressively increased as smaller and more defective trees from an increasing variety of species were utilised.

Most of the valley forests have now been cleared and the structure of most remaining forests severely degraded. Most of the forests logged in the past few decades have been invaded by lantana, which smothers native understorey species and suppresses regrowth of canopy species. Many of these degraded forests provide ideal habitat for Bell Miners who are forming dense colonies and aggressively mobbing and excluding other species. The consequences of this are outbreaks of sap-sucking psyllids that are causing dieback of remnant eucalypts. Over recent decades the Bell Miners have been expanding out of the wet valleys at lower elevations to dominate whole landscapes.

Most of the remnant forests are restricted to the ranges and occur on public lands, with the state forests part of the Forestry Corporation's Urbenville Management Area. The region includes a number of National Parks, including Border Ranges, Toonumbar, Richmond Range, Yabbra, Tooloom, Koreelah, Mount Clunie and Mount Nothofagus. These were converted into national parks from state forests, particularly in 1979, 1982 and from 1995-8. BMAD remains as a toxic legacy from the Forestry Corporation in these national parks.

The region's remnant forests comprise part of one of the world's centres of biodiversity, being within the "Border Ranges North and South", one of Australia's 15 outstanding biodiversity hotspots, areas which are rich in biodiversity but also under immediate threat. All or parts of the region's national parks are included in the Gondwana Rainforests of Australia World Heritage Area, with the remaining (more recently created) reserves identified as qualifying for addition to the World Heritage property.

Dieback has been identified as a problem in the Border Ranges Region for almost a hundred years. As noted by Jurskis and Walmsley (2012) for the Urbenville Region:

> *Near this area, Forestry Commissioner Jolly described declining stands of ironbark (Eucalyptus siderophloia) that were affected by scrub invasion and psyllids in the early 20th Century (Forestry Commission N.S.W. 1920). In the early 1980s, decline was evident in a high quality mixed hardwood stand at Section E, South Yabbra (VJ pers. obs.).*

NEFA have been trying to get action on Bell Miner Associated Dieback (BMAD) in the Border Ranges region for over 20 years. We tried to get the Forestry Corporation to address it in their Environmental Impact Statements and have vainly tried to have their on-ground management improved through our participation on the North East State Forests Harvesting Advisory Board in 1996-8 and Bell Miner Associated Dieback Working Group since 2000. Over that time the Forestry Corporation have been in denial about the extent of the problem, its causes and the consequences.

The first meeting (8 July 1993) of the Community Consultative Committee for the Urbenville Forest Management Area EIS identified a variety of key issues for consideration regarding management of the Urbenville forests, including *"the dieback/bellbird association with logging"*. This was of course ignored in the EIS.

Stone *et. al.* (1995) relied upon District foresters to identify areas of Bell Miner Associated Dieback in their areas as at 1992, for the Urbenville Management Area reporting "Total affected area surveyed = 380". The author was a resident of the area around this time and has no doubt that this in no way represents the extent of BMAD in the area at that time. This view was supported by the Urbenville District Forester, Paul Sharpe (pers comm., 1996) who estimated that there was in the order of 5,000 hectares affected by "Bellbird Dieback" on State Forests in the then Urbenville Management Area. This is still considered a conservative guesstimate.

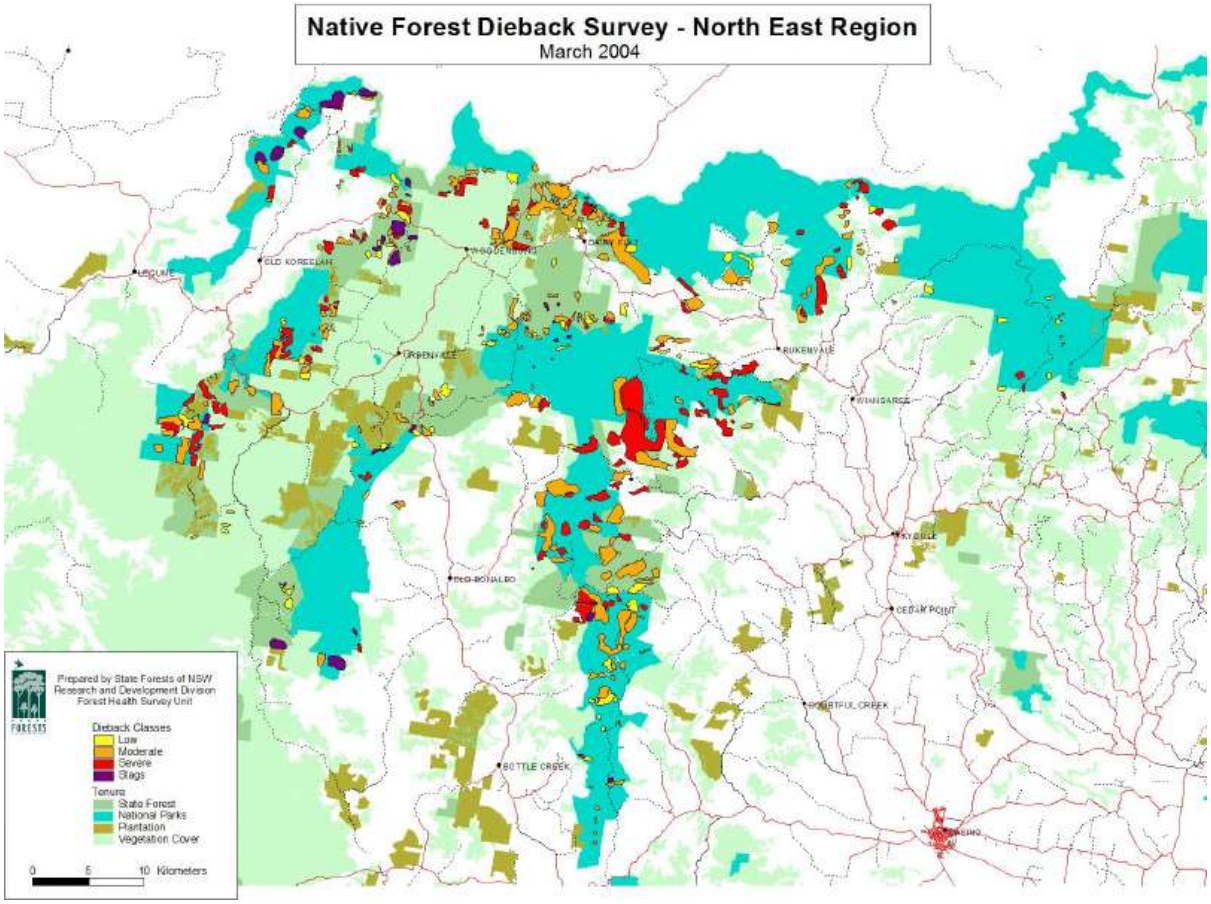
In 2004 the Forestry Corporation identified almost 20,000 hectares of the approximately 100,000 hectares of apparently susceptible forest types in the Urbenville Management Area as being affected by dieback attributed to BMAD. The mapping involved visual classification of BMAD from an aircraft in four main severity classes:

- Low -consisted of discoloured foliage, partial thinning of canopy and distinct epicormic buds on branches.
- Moderate -consisted of discoloured foliage, severe thinning of tree canopy and a few dead trees including distinct epicormic growth.
- Severe -consisted of many dead trees, severe thinning of crowns, low stocking rate of susceptible species and greatly increased mesophyllic ground story vegetation including weeds such as lantana.
- Stags -large trees that have been dead for a long time present in mesophyllic forest; unable to determine cause of death but potentially related to past occurrence of dieback.

The Forestry Corporation mapped the following areas of severity classes: Low 2,205ha Moderate 9,776ha, Severe 6,511ha, and Stags1,382ha.

The 2004 assessment was conservative. Jurskis and Walmsley (2012) recognise that the aerial assessment missed *"some areas of declining forest that were previously identified but overlooked in the 2004 reconnaissance, for example at 'Section E', south Yabbra and at Edinburgh Castle and Unumgar"*. Many other areas of severe and obvious dieback known to NEFA were also inexplicably missed in the Forestry Corporation's assessment. For example the south Yabbra area had been

suffering from BMAD for over 30 years (pers. obs.), with large areas of severe dieback, and despite being on the flight path of the aerial survey was not recorded.




Jurskis (2005) used the results from Stone *et. al.* (1995) and their 2004 survey to conclude *"In the far north coast, the area of declining forest increased from less than 1000 ha in 1992 (Stone et al., 1995) to at least 20,000 ha in 2004 (Forests NSW, unpublished data)"*. This is clearly a nonsense as there was far more than 380ha hectares affected in 1992 (pers. obs.), yet this fallacy has been treated as fact by Jurskis and his colleagues ever since (i.e. St Clair 2009, Jurskis and Walmsley 2012). While it is agreed that the extent of BMAD is expanding it was historically far more extensive than the Forestry Corporation are willing to admit.

This misrepresentation is used by the Forestry Corporation to support their fiction that the spread of BMAD is due to changed fire frequencies, i.e. Jurskis and Walmsley (2012) claim:

> *Between 1992 and 2002, State Forests that had been frequently burnt in the Urbenville Management Area (Forestry Commission of New South Wales 1995) remained unburnt (Jurskis et al. 2003). Over the same period the area of declining forest increased from about 1000 ha to at least 20,000 ha (Jurskis 2005a).*

Since 2004 the extent and severity of dieback has increased significantly due to the Forestry Corporation's targeting of BMAD affected and susceptible forests for logging, particularly since 2009. For a while the Forestry Corporation maintained they were trying to do something about BMAD, preparing a Harvesting and Rehabilitation Plan for Donaldson State Forest Compartments 44-49 in 2003 and undertaking trials of understorey management in 2005. Then in 2007 they monitored a logging and burning "trial" in Mt. Lindesay State Forest.

In 2005 the BMAD Working Group determined to undertake trials of lantana control on private property at 'Creeks Bend' on Ironpot Creek, Donaldson State Forest and at Sheepstation Creek in Border Ranges National Park, to test the hypothesis that:

> *The removal of the dense understorey in areas affected by BMAD will make the habitat less suitable for Bell Miners. This will break the birds' dominance of the site, allowing other bird species that prey on psyllids to invade the area and consume the invertebrates. This will put an end to the dieback, resulting in healthy forest canopy species.*

The BMAD Working Group (2006) developed Minimum Standards for Monitoring Surveys which identify minimum monitoring requirements for note:

> *The Bell Miner Associated Dieback field trials are designed to test whether certain management actions are causing a positive response to the health of trees in BMAD areas. An important component of these trials is the establishment of monitoring programs that can be used to measure the response or change in trend. ... Collection of monitoring data is fundamental to evaluating the long term success or failure of the field trials.*

Though, since it became obvious the trials were a failure, the Forestry Corporation stopped the monitoring and have been targeting BMAD areas for intensified logging to remove any merchantable trees, abandoning any pretence of rehabilitation in the process. In 2009 the Forestry Corporation abandoned their Donaldson trial, returning to Donaldson 45 and 46 to log "Harvesting Exclusion" areas and the BMAD trial area. In 2009 they logged the historically recognised BMAD area in Yabbra State Forest 163. In 2010 they logged mapped severe and moderate dieback areas in Richmond Range State Forest 329. In 2013 they logged mapped moderate and "stag" dieback areas in Koreelah State Forest 27, 28 and 31. In these areas they abandoned any pretence of "scientific logging" and instead targeted BMAD affected stands for removal of "*unhealthy merchantable trees"* with no rehabilitation proposed. In all these areas and adjacent compartments there have been unmapped areas of BMAD and susceptible areas that have been intensively logged. Stands of the resistant Brush Box in the vicinity of the dieback were also targeted for intensive logging.

The Harvesting Plan for compartment 329 of Richmond Range SF identifies areas around 3 log dumps as *"Poor, severely affected by forest decline associated with Bell Miners (BMAD). Infestation of lantana widespread. This section will require a more intense regime of machine disturbance"*, around 3 log dumps as "*Moderately affected by BMAD. Lantana invasion of the midstorey is occurring",* and around 3 as *"Good. Stand shows little sign of BMAD at this stage, mostly grassy and herbaceous understorey"* (though with 2 log dumps cited twice for different severities). The silvicultural plan allocates logging intensity according to the degree of BMAD, with the worst affected areas targeted for the heaviest logging *"Heavy STS, 50% BA removal"*, noting *"Heavy STS will result in higher BA removal in the area indicatively marked on the operational map. Machine disturbance will be more intense. The aim of this treatment is to create suitable conditions for seed regeneration and reduce Bell Minor* (sic) *habita*t". This was contrary to their licence, as the presence of the endangered Black-striped Wallaby required 50% canopy retention and minimum understorey disturbance, it was also obvious from Forestry Corporation's trials that this treatment would make the BMAD worse. Logging commenced in November 2010. A brief visit in 2014 found that an area then described as *"Good. Stand shows little sign of BMAD at this stage, mostly grassy and herbaceous understorey"* is now suffering from BMAD.

**Forest identified in Richmond Range SF as "Good" with little sign of BMAD is now suffering from BMAD with numerous dead and sick trees following logging in 2010.**

While the Forestry Corporation have been rampaging through the forest spreading lantana and BMAD, private landowners at Creeks Bend have been successfully rehabilitating BMAD areas by controlling lantana.

The Forestry Corporation identified rehabilitation costs at Mount Lindesay SF as ranging from $200-$2,500 per hectare, with the highest costs associated with replanting. On private property at Creeks Bend the rehabilitation costs were $250 per hectare. The more the forest is degraded the higher the rehabilitation costs. If it is assumed that some 10,000 ha of the Border Ranges forests are now severely degraded with rehabilitation costs of $2,500 per hectare and 20,000 ha low-moderately affected with rehabilitation costs of $250 per hectare, then the costs of rehabilitating affected forests would be in the order of $30 million, with costs increasing as logging further degrades the forest and spreads BMAD.

**Tens of thousands of hectares of forest in the Border Ranges Region are affected by BMAD as forests are invaded by lantana and Bell Miners following logging. The outcome is increasing dominance by dead and dying trees. The community has been requesting the Forestry Corporation recognize the relationship of BMAD with logging and deal with the problem since at least 1993.**

**The Forestry Corporation has consistently refused directions to map BMAD in their harvesting plan process and develop rehabilitation strategies since 1997. Attempts to systematically map BMAD across the landscape were initiated then, though it was not until 2004 that the distribution of BMAD was mapped across the Border Ranges, even then many affected areas were unaccountably missed. Management trials in 2005 and 2007 proved that the Forestry Corporation's management was the problem, so they stopped monitoring the outcomes. Since then the Forestry Corporation have been targeting BMAD affected forests for intensive logging and leaving destroyed ecosystems behind.**

**The costs of rehabilitating BMAD affected forests in the Border Ranges region is likely to already exceed $30 million, with costs rapidly increasing as the forests are further degraded.**

**The Forestry Corporation's deliberate refusal to deal with BMAD in a responsible manner for over 20 years has resulted in its ongoing spread through the Border Ranges. They know what they are doing. That they are perpetuating the degradation and death of vast swathes of forest under the guise of Ecologically Sustainable Forest Management and the pretence of "Adaptive Management" is reprehensible. Their environmental vandalism must be stopped.**

**A sustainable response to Bell Miner Associated Dieback involves:**

**a) Identifying and mapping all affected and susceptible areas;**
**b) Placing all affected and susceptible areas under a logging moratorium until such time as appropriate management responses that restore ecosystem health and functioning are identified;**
**c) Undertaking rehabilitation works (i.e. lantana control) in affected stands; and,**
**d) Monitoring effects of any treatment and refining methods before repeating it.**

## 6.1. DONALDSON STATE FOREST

The Forestry Corporation prepared a Harvest & Rehabilitation Operational Management Plan for Compartments 44-49 of Donaldson State Forest on 17 October 2003. The forest was last logged in 1976-82 and had "*not been grazed or burnt for approximately 10 years*" (Shipman 2006). The aim was to undertake *"the harvesting of native forest and rehabilitation of a range of areas exhibiting dieback*". Forest condition was described as:

> *Understorey ranges from regrowth and dense lantana in compartments 46 and 47, shrubs and grasses in compartment 44 and a mixture of grasses, shrubs, lantana in more open forests giving way to rainforest species, ferns and lantana in openings in moister areas with larger canopies and less light reaching the forest floor.*
>
> *Overstorey development is greatest on steeper terrain and poorly developed on lower slopes. This reflects access and previous harvesting intensity. There are areas of*

> *overstorey dieback in cpts 46 and 47 and replanting with dieback resistant species should occur, provided lantana control can be implemented.*
>
> *...*
>
> *Dieback is evident, particularly in cpt 46 surrounding the old mill site. Lantana invasion is widespread in any open forest or openings within the closed forest canopy.*

In 2005 the BMAD Working Group determined to help fund trials of lantana control on Donaldson State Forest as one of three trials of using understorey control to redress BMAD. The trial was intended to:

- *Remove 25 hectares of dense shrub understorey in moist sclerophyll forest using dozer with follow-up spraying of herbicide.*
- *Remove 20 hectares of dense shrub understorey in grassy forest using dozer with follow-up regular low intensity fire.*
- *Remove 34 hectares of light to medium density shrub understorey in grassy forest using regular low intensity fire.*

The trial was meant to go for 15 years from November 2005 till 2020, with annual reports for first 3 yrs, then every 2 years thereafter. Costs were given as $35,203 in kind and $67,336 from the Environmental Trust via the BMAD working group.

The Plan identified three management harvesting regimes

a. **Control** – No harvesting, burning or grazing (see green areas on map).

**b. Conventional Single Tree Selection** (i.e. 60% canopy retention, see yellow areas on map,**)**

c. **Bellminer Associated Dieback harvest** (retain, where possible and appropriate, viable habitat, recruit habitat and feed trees on a broad area basis, see orange areas on map)

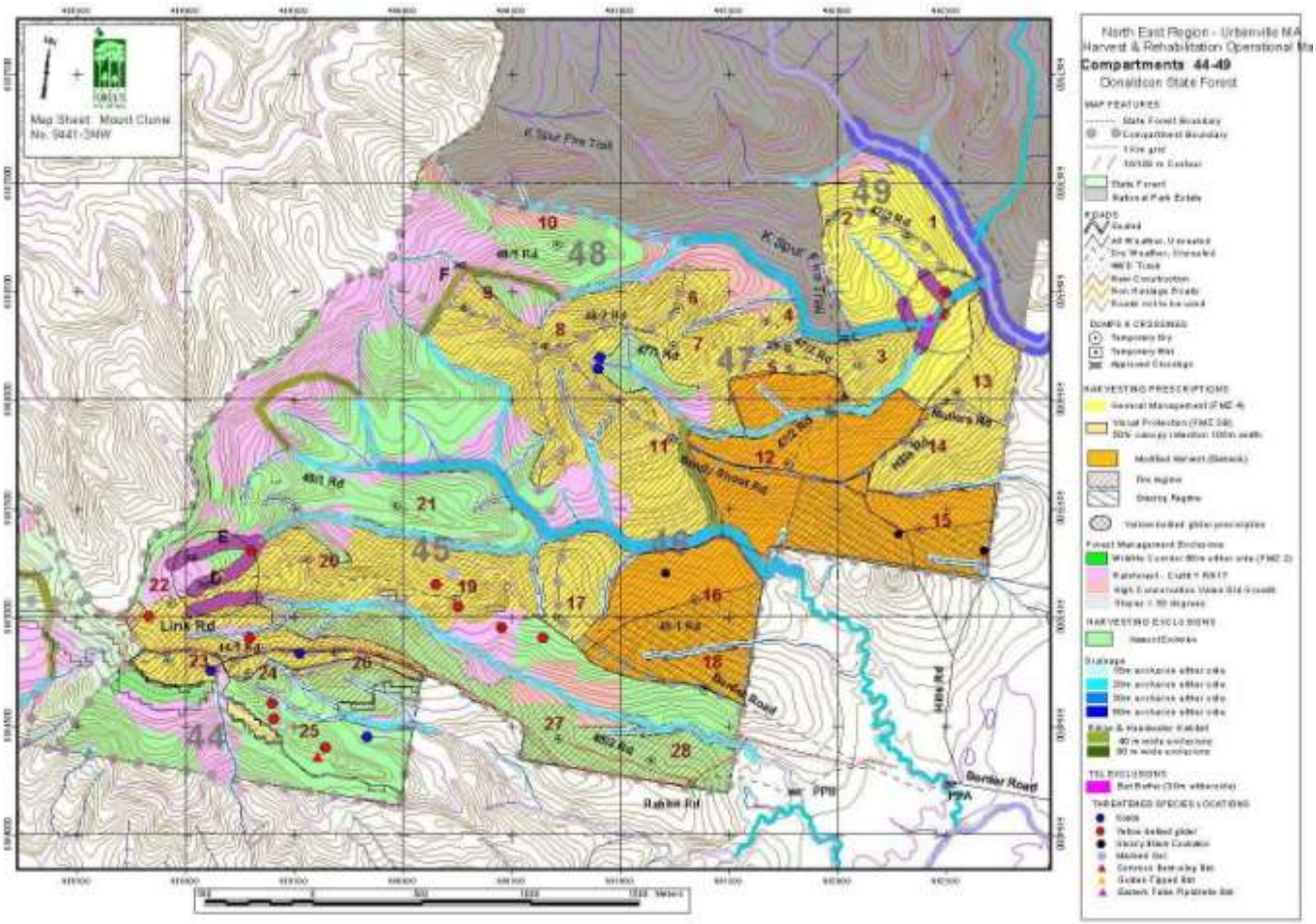
The Management Plan proposed:

> *The area of each silvicultural treatment must be mapped and recorded in the Post-logging Information section of the harvest plan.*
>
> *Photographic records to be taken before and after treatments from a nominated point. Subsequent photos every 2 years at similar time of year.*
>
> *Dieback Survey forms to be completed for each area prior to harvesting and for areas not to be harvested in this operation.*
>
> *A regeneration/stocking survey to be conducted within 12 months of treatment. Corrective action to be taken if regeneration or planted stocking not adequate.*

For the mapped Bell Miner Associated Dieback area the Forestry Corporation apparently undertook understorey control using mechanical clearing, herbicide spraying and burning, without logging, in 2005. The area included stands which naturally had both grassy and rainforest understoreys, with the grassy area subject to a burn, the area with a rainforest understorey tractor cleared and sprayed with a herbicide, and an intermediate area (which "*may or may not have had a grassy understorey*") tractor cleared and burnt (Shipman 2006).

Shipman (2006) undertook intensive sampling of part of this area in compartment 46. Unfortunately the write up of results is poor and selective (i.e. native species other than eucalypts were classed as "weeds" and only one of the three treatments is stated to form "*the basis of this report*") so it is not possible to be quite sure what the outcomes were. There was also no attempt to assess the

effectiveness of each of the three treatments. Shipman (2006) reports that the basal area of live "commercial" eucalypt trees over 10cm dbhob was reduced by over 40% following treatments (i.e. from 28.7m$^2$/ha to 17.1m$^2$/ha) presumably killed by dozing and burning, though he used different sampling methods pre and post logging that identified a 56% increase in basal areas post logging on control plots, thereby indicating the reduction in basal area in the treated area was far greater than 40%. Shipman (2006) reports that *"the prolific weed growth became a problem after fire*", and that "*There was patchy and generally poor regeneration of native forest eucalypts over the three treatments*".




The inadequacies of the report are made evident by St.Clair (2009), who supervised the work, reporting that "*Shipman (2007) reported that 32 % of 60 plots had no eucalypt regeneration, 36 % had a stocking of 250 stems ha-1 and only 32 % had a stocking of 500 stems ha-1 or more".* Though in Shipman (2006) these results are presented in section "4.2 Basal Area" and in a paragraph discussing basal area (i.e. live commercial eucalypts >10cm dbhob) across both treated and untreated areas, with no apparent connection to regeneration. In Shipman's (2006) section "5.3 Low eucalypt regeneration" it is stated *"the distribution of seedlings was not uniform and ranged from 254 to 6347 stems per hectare"*. Its hard to know what the results were.

The supposed annual and biannual reports on the trial have not been sighted, despite a request to the Forestry Corporation to provide any monitoring results. It appears that, despite funding from the Environmental Trust, the trial was effectively abandoned with only the first year's monitoring results being available. Though given that it is apparent that many of the retained trees were killed in the

treatments, that there was prolific weed growth and that there was apparently inadequate eucalypt regrowth it is evident that the trial was a failure.

St.Clair (2009) reports that another student project in the same area found:

> *... In a previous project at Donaldson SF it was found that the most severe treatment (mechanical disturbance and hot fire) produced a greater reduction in bell miner numbers and increase in other bird species than did either burning alone or herbicide spraying alone (Mews 2006). ...*

A review of the Bell Miner data provided by the Forestry Corporation to the BMAD Working Group for four replicates each of 3 treatments and a control, apparently 7 months after logging, indicate a 39% (27-66%) reduction in Bell Miner numbers on the controls, compared to an average 73% (11-95%) decline on the treated sites. Note that, from this data, the greatest decline was in fire alone treatments rather than the dozer and fire regime treatments, contrary to St Clair's claims.

**Bell Miner counts on Donaldson plots (results average over four replicates for each treatment) (adapted from data provided by Peter St Clair to BMAD Working Group)/**

| Treatment | Before | After | Average Decline | Decline Range |
|---|---|---|---|---|
| **T1 Dozer & herbicide** | 122 | 51 | 59% | 11-95% |
| **T2 Fire regime** | 149 | 26 | 83% | 70-94% |
| **T3 Dozer & fire regime** | 106 | 27 | 75% | 49-86% |
| **Controls** | 148 | 91 | 39% | 27-66% |

Aside from the numerous site and vegetation variables not accounted for, and the significant overlaps between treatments, the principal problem is that 7 months is too short a time-frame to reach any meaningful conclusions other than that Bell Miners declined significantly immediately following burning and clearing of the understorey, including on nearby unaffected stands. It can be expected that nestlings would have suffered high mortalities during treatment, which means this could be a temporary effect.

This is not a good enough foundation for "adaptive management", quite apart from the fact that the assessment appears to have been limited to some 7 or so months post treatment with no subsequent follow up, it is impossible to learn from trials if you don't monitor and document them. It appears that the Forestry Corporation did not like the results and simply abandoned the trial despite committing to monitoring the outcomes for 15 years. Shipman (2006) emphasised *"Possibly further investigations after 21/2-3 years would yield different results ...The impact of treatments should be monitored over several years"*

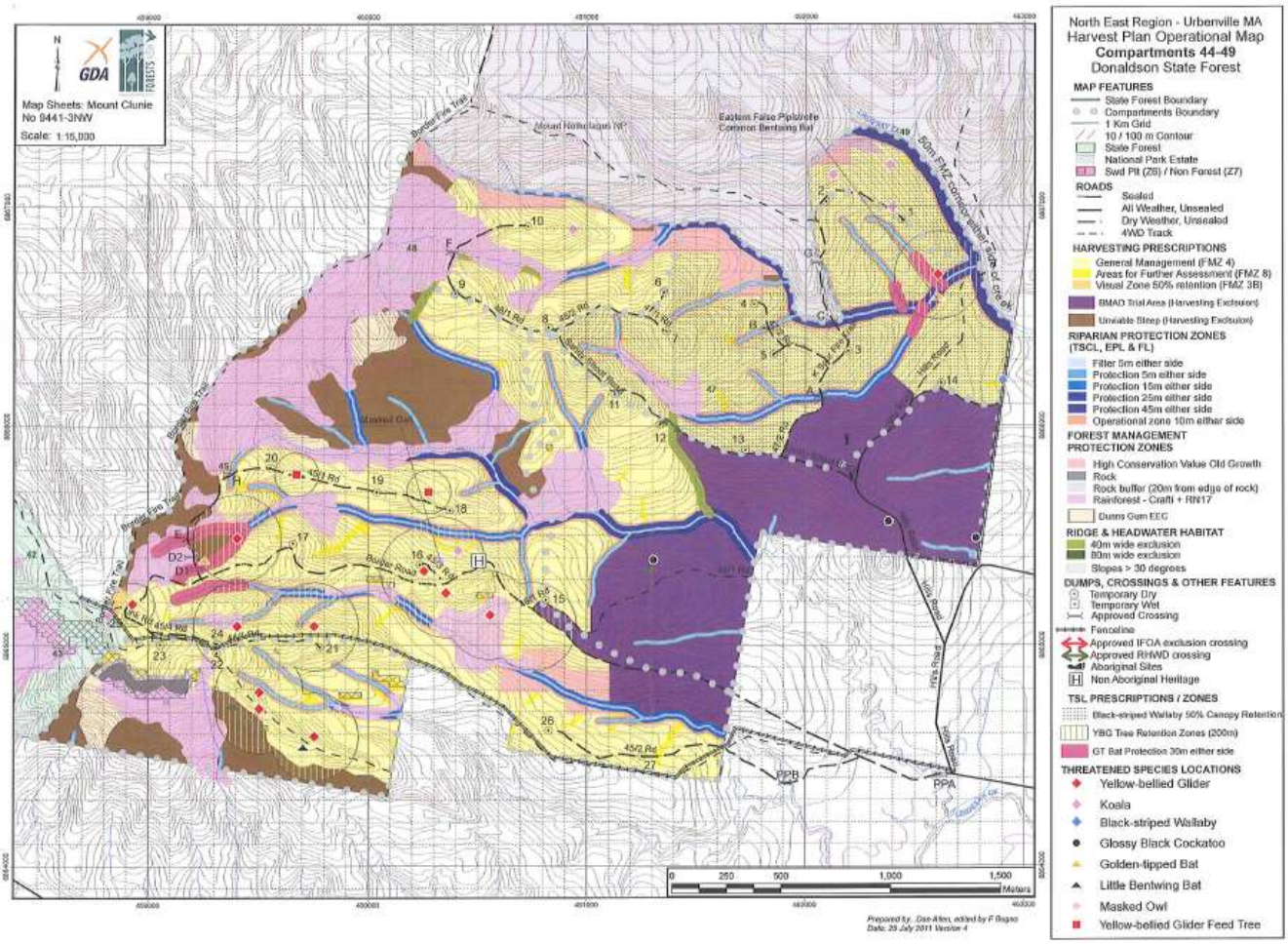
Part of the Donaldson trial area in compartments 45 and 46 was visited in May 2014, with the track forming the boundary of the Shipman (2006) area walked and visually assessed. Dense lantana growth meant that the area could not be readily assessed away from the track. The visual evidence is that, in this area at least, the trials utterly failed to control lantana, Bell Miners or BMAD. Lantana dominates the understorey, many trees are dead, most remaining eucalypts show evidence of BMAD (mostly severe), regeneration of eucalypts is patchy, wattles or lantana dominate large areas with few eucalypts. The Forest Red Gum stands at lower elevations seem to have been particularly severely affected with numerous dead and dying trees and little eucalypt regeneration.

The trial in this area was apparently an abject failure and the forests remain in a parlous state, which, given the high eucalypt mortality in the treatments and the current abundance of lantana and Bell Miners is likely to be worse than before the treatments.

The Forestry Corporation apparently abandoned monitoring after 7 months because the outcomes didn't agree with their claims. Currently the regenerating eucalypts, which are around 10m tall, appear healthy, though this is not expected to remain the case once they reach pole stage (i.e. >30 years old) and start showing dieback symptoms (Jurskis and Walmsley 2012). Given that most of the wattles are expected to die out once they are around 20-30 years old, the full ramifications of the Forestry Corporation's trial are not expected to become apparent for another 10-20 years.

There is no evidence that the Forestry Corporation learned anything from these trials. They effectively abandoned the trial in 2009, returning to log parts of the trial area and adjacent exclusion areas. It is assumed that none of the required monitoring was undertaken for this logging operation.

The IFOA Report identifies that based on the 2003 Harvest & Rehabilitation Operational Management Plan for Compartments 44-49 logging commenced on 23 September 2009 and was suspended on 27 October 2009. Later IFOA reports claim that logging was suspended on 10 December 2011, so it may have been stopped and restarted once the Harvest Plan was re-written to open up the exclusion areas for logging and prohibit logging in the BMAD trial area.



Our recent inspection found that forests south of Border Road identified as “Harvest Exclusion” in that 2003 plan were logged in the 2009/11 operations, along with significant parts of the “Modified Harvest (Dieback)” trial area. That this logging was in contravention of the 2003 harvesting plan and compromised the BMAD trials speaks volumes about the Forestry Corporation’s commitment to adaptive management.

Below are photos of Shipman’s (2006) monitoring area, the “Harvest Exclusion” area logged in 2009/11, and the Trial area logged in 2009/11. Note the proliferation of weeds, poor regeneration, sparse canopy, and BMAD. The naturally grassy understorey is being swamped by lantana, crofton weed and Blady Grass. It was not apparent that any follow up treatment (other than burning) or planting had been undertaken in the 2009/11 logging.

The current Harvesting Plan for Donaldson State Forest, Compartments 44,45,46,47.48 & 49 was signed off on 21/9/2010. The revised plan deleted most of the harvesting exclusion areas identified in the 2003 plan, and changed the boundaries of the BMAD trial area. The new plan identifies the Bell Miner trials that were undertaken, though makes no mention of the trial’s failure or the 2009 logging event. Part of the 2003 “Harvest Exclusion” area that was logged in 2009 was remapped as the “BMAD Trial Harvesting Exclusion Area” (purple) and part added to the net logging area. A large part of the “Modified Harvest (Dieback)” trial area that was logged in 2009/11 was remapped as “BMAD Trial Harvesting Exclusion Area” in the 2010 harvesting plan.

A large part of what was first identified as the “Modified Harvest (Dieback)” trial area and then remapped as “BMAD Trial Harvesting Exclusion Area” in the 2010 harvesting plan logged in the 2009/11 events, again with bad outcomes and no apparent planting, as shown below.

It is somewhat confusing as to whether the 2003 harvesting exclusion area was logged in 2009, or after part of it was made available for logging in 2010, and whether the adjacent BMAD Trial area was logged in 2009 or after logging was prohibited in 2010. The Forestry Corporation have refused to provide any of the documents requested to try and sort this out. Either way it is a disgrace.

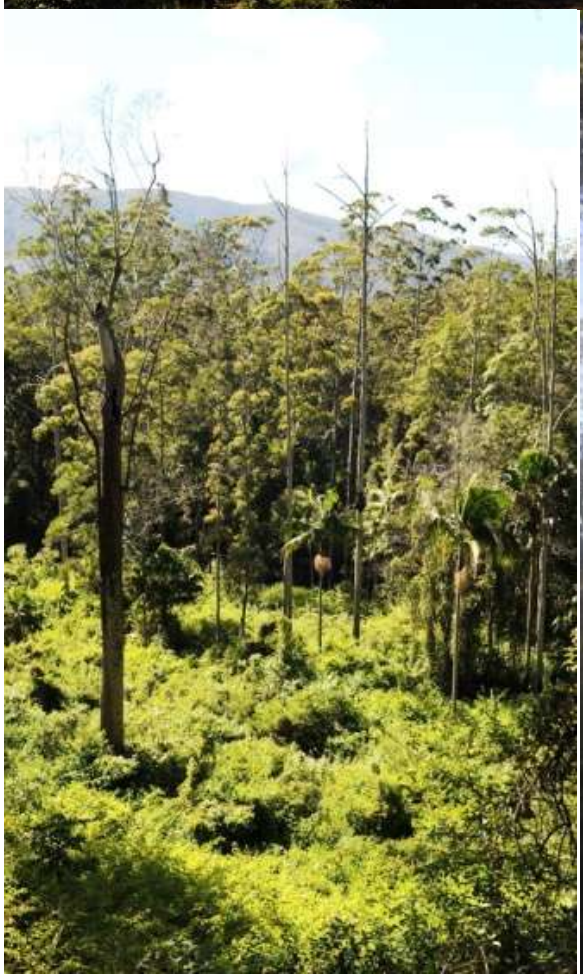
The 2010 Harvesting Plan states:

- Canopy assessment across the compartments varies from healthy to being severely affected by dieback. The areas most severely affected by dieback are generally contained within the Bell Miner Associated Dieback trial area as indicated on the operational map.
- Dieback is evident in various levels across parts of the harvest area. In affected areas the site is understocked and trees have thin crowns. There are numerous dead stags scattered across the harvest area. In affected areas understorey is predominately lantana under more open canopy and there is little healthy regrowth or potential for regrowth in the current state.

The Plan confirms our findings that the 2005 trials were a failure. The plan also misrepresents the extent of BMAD in the area, as severe and extensive BMAD occurs well outside the trial area, and it appears to have been a major problem for far longer than the last few years. The harvest Plan is fraudulent in not admitting to the 2009 logging event, the logging in the trial and exclusion areas, and for misrepresenting the extent of BMAD in the area.

**ABOVE AND BELOW: BMAD REHABILITATION OR FACILITATION? DONALSDON 2014**

**ABOVE AND BELOW: 2009/11 LOGGING OF BMAD EXCLUSION AREA. DONALDSON 2014**



**ABOVE: 2009/11 LOGGING OF BMAD TRIAL AREA. DONALDSON 2014**

The Donaldson trial area has been compromised and subverted by the Forestry Corporation's 2009/11 logging and the apparent abandonment of the trial in the 2010 plan. Any person relying

upon the claimed history to review the trials in the future will be fundamentally misled. It is doubtful the monitoring required by the 2003 Plan of the 2009 logging was undertaken. What is most astounding is that despite it being clearly evident that the understorey bulldozing, burning and spraying treatments applied in the trial area failed, the Forestry Corporation are proposing more of the same, with the current IFOA report identifying that logging was scheduled to resume in these compartments on 4 March 2014. The same failed management is proposed and any pretence of monitoring has been abandoned:

**Rehabilitation of dieback affected areas:**

**Assessment**

Forests NSW Crown Dieback classification system and Forest Dieback Survey Form is used to identify areas for treatment. Area with severe crown dieback to be targeted for the following treatments

**Treatment**

Treatment is to be developed on a site specific basis as operations progress by the Harvesting Team Leader and may involve a combination of harvesting, seed tree retention, mechanical disturbance, planting, weed control, and reintroduction of a low intensity fire regime. Treatments to be applied as required to obtain satisfactory regeneration event..

SFO must mark on the HPOM areas of each treatment applied and note areas requiring follow up mechanical disturbance, burning and/or planting treatment.

**Despite significant contributions of public money and commitments to undertake and monitor a 2005 BMAD management trial n Donaldson SF for 15 years, the Forestry Corporation only monitored the outcome for the first year before abandoning the trial and logging both trial and exclusion areas in 2009/11. So that the public money spent on the BMAD trials in Donaldson are not wasted it is important that those plots not compromised by the logging are reassessed to document the longer term effects of the treatments applied. Judging by the visual appearance of the area inspected rehabilitation efforts were an abject failure in controlling lantana, Bell Miners and BMAD, though some lessons should be able to be learnt from an independent review of updated data.**

## 6.2. MOUNT LINDESAY STATE FOREST

NEFA inspected compartment 276 and 279 of Mt Lindesay SF in 1997 when on the North East State Forest Harvesting Advisory Board (NESFHAB) in response to the Forestry Corporation's proposal to log the area. At that time the whole compartment was dominated by Bell Miners, particularly at lower elevations where BMAD was evident. Bell Miners had apparently been in the vicinity for a long time as the nearby "Bellbird Rest Area" was shown on the 1985 Second Edition of the Forestry Corporation's Forest Project Map.

This area highlighted the issue of BMAD for the NESFHAB, leading to the preparation of "Discussion Paper: Psyllid/Bell Miner dieback area management" (Sharpe 1997) that proposed

undertaking large scale rehabilitation of severely affected areas, and as part of the Harvesting Plan process mapping areas affected (by class), identifying proposed management (including excluding logging from areas *"if it is decided that harvesting will further exacerbate the problem and that rehabilitation works are either impractical or unlikely to succeed"*) and details of specific remedial works. Unfortunately the Forestry Corporation blocked progress on this until the NESFHAB was disbanded and then abandoned it.

BMAD in the vicinity of the now removed Bell Bird Rest Area, Compartment 276, May 2014

An outcome of the NESFHAB was a project to use Digital Multi-Spectral Video (DMSV) to quantify the extent and degree of canopy dieback in a 10,000 ha study area centred on Mount Lindesay, with the aim to be able to later use map comparisons *"to determine the stability of bellminer colonies, rate of spread of the dieback, make predictions on future spatial patterns and directions of the dieback across the landscape and confirm the stand risk criteria"*. In the end 5,000ha of State Forests was mapped using DMSV (all of Mt. Lindesay SF and compartments 34, 38, 55-58 of Donaldson SF), with 1:25,000 aerial photographs of all compartments and infra-red aerial photos of 8 compartments. Unfortunately insufficient ground plots were able to be completed (even with NEFA's assistance) and it seems the real intent of the mapping was for other purposes. Though the infra-red mapping was used to map crown health and thus BMAD (including in Mount Lindesay 279). Despite costing around $100,000 it seems the outputs of this project were simply discarded and not followed up.

The Forestry Corporation established trials in BMAD in compartments 276 and 279 of Mt Lindesay State Forest in 2007. It must have been apparent by then that the Donaldson trials failed. The forest had been variably logged, with the logging trials situated in a variety of forest types and a mixture of growth stages (disturbed oldgrowth, disturbed mature and young) mostly heavily logged from 1974-

84, and the “control” mostly re-logged in 1996. The trials involved logging in combination with variable applications of mechanical disturbances, weed spraying, and burning, with some follow up weeding and planting. Objectives of the project were:

1. Lantana cover reduced to less than 15%
2. Increased health of retained trees
3. Decrease in abundance of bell miners (An indication of reduced habitat or food)
4. Maintenance of grassy understoreys
5. Restoration of severely degraded stands with natural regeneration, supplementary seeding and enrichment planting of native over-storey species
6. Integration of harvesting and rehabilitation

Forty plots were established in treated and 20 in control areas with stratification based on broad forest types. Harvesting was conducted over the period May to September 2007. The results were apparently confounded by good rainfall leading to an improvement in tree health, a decline in lantana and a decline in Bell Miners on all plots, including the control. The reported results were only for the first two years. St.Clair (2009) reports on the outcomes, which can be summarised as:

- within 2 years Bell Miner numbers had recovered to pre-treatment levels relative to controls;
- Bell Miner numbers were related to lantana density;
- reductions in lantana cover was significant only in moderate and high intensity fire treatments, though lantana was showing significant recovery in the second year;
- the treatments did not improve the health of the retained trees relative to controls;
- Brush Box regeneration was two orders of magnitude greater than the eucalypts;
- regeneration of eucalypts was inadequate at most sites; and
- planting of eucalypt seedlings is vital to maintain a natural species composition in mixed stands.

The number of variables involved (such as 6 different forest types, numerous different canopy species, different understorey types, different disturbance histories and intensities, 4 disturbance types, lantana control, replanting etc) confounds meaningful interpretation of the results. Undaunted St.Clair (2009) uses his short-term results and some convoluted logic to support his pre-determined position that the *“removal of bell miners and poisoning or burning of lantana per se will not improve tree health. The phenomenon of linked lantana, psyllid and bell miner invasions is a consequence of poor tree health caused by deteriorating root function under changing soil conditions in the absence of fire as proposed by Jurskis (2005)”*. Based on this flawed assumption he goes on to make a variety of far reaching recommendations.

St.Clair (2009) does note “*Whilst the cost of the project was significant, the opportunity cost of doing nothing is greater. The cost of rehabilitation was less than the likely loss of production if the forest continued to decline and die*”. St.Clair’s (2009) estimated rehabilitation costs per hectare over 40 years ranged from $200-2,500, though given the poor prognosis for much of his sites this may just reflect initial costs.

For this review Hildebrand Road on the boundary between the compartment 276 and 279 was traversed in May 2014. BMAD was found to be widespread. The abundance of Bell Miners and lantana appeared to have markedly increased, and the structure of the forest deteriorated, since our 1997 assessment. There are numerous dead, dying and other BMAD affected trees, large areas have no or little overstorey, lantana dominates most of the understorey with large areas of wattles and patchy regeneration of eucalypts. As with Donaldson it is apparent that the full ramifications will become apparent over the next 15-25 years once the wattles begin to senesce and the regrowth

reaches pole stage and begins to show the effects of BMAD. It is evident that the objectives of the trial were not achieved and that the trials were once again an abject failure.

NEFA requested the Forestry Corporation to provide us with any additional results, beyond the first two years, on our Yabbra field inspection with CEO Nick Roberts in 2012, and have again asked Mr Roberts for any additional data while preparing this report. Despite claims that there may or may not be additional data nothing has been provided.

**It is now 7 years since the Forestry Corporation conducted their 2007 BMAD logging trials in Mount Lindesay SF, yet it appears they only monitored the outcomes for the first two of the 15 year trial. Their results proved the trials to be a failure and any improvements to be temporary. Seven years after the trials it is now obvious that the trials were a bigger failure than the Forestry Corporation are willing to admit, with the full extent of the failure expected to become more apparent in 15-25 years as the patchy regrowth becomes affected by BMAD and the wattles senesce. There is a large body of data collected over the past 17 years for Mount Lindesay State Forest that should be replicated and used to identify changes in the distribution, intensity and effects of BMAD over that time. In particular the 1997 forest health mapping should be repeated. This will enable the logging trials to be considered in context and for meaningful results to be obtained.**

**ABOVE AND BELOW: BMAD REHABILITATION OR FACILITATION? MT LINDESAY 2014**

## 6.3. YABBRA STATE FOREST

Bell Miner Associated Dieback occurs in compartments 162 and 163 of Yabbra State Forest. BMAD has been evident in the area since at least the early 1980s (pers. obs., Jurskis and Walmsley 2012), and despite being severe over an extensive area of compartment 163, known about by the Forestry Corporation, and on the flight path of the Forestry Corporation's aerial survey, was inexplicably missed in their 2004 BMAD mapping.

The area contains the Endangered Ecological Community *White Gum Moist Forest,* the inadequately reserved ecosystems Grey Box-Red Gum-Grey Ironbark, and Wet Bloodwood-Tallowwood (which have achieved 41% and 82% respectively of their national reservation targets), and was home to the endangered Black-striped Wallaby and a host of other threatened fauna.

These compartments were audited by NEFA following logging in 2009. The Harvesting Plan claimed that 65% of the canopy would be retained, the Threatened Species Licence required that 50% of the canopy must be retained for the Black-striped Wallaby, along with specific tree retention requirements for Yellow-bellied Gliders (for which 32 records existed), Koalas and Glossy Black Cockatoo. There were also standard prescriptions for the retention of 10 hollow-bearing trees, 10 recruitment trees and 6 eucalypt feed trees per 2 ha.

The Harvesting Plan for compartments 162 and 163 of Yabbra SF (4.2) states:

> *Lantana & shrubby understorey is providing conditions suitable for occurrence of Bell Minor* (sic) *Associated Dieback (BMAD). A significant section of the harvest area has been adversely affected. There are many dead stems and the crowns of some of the remaining trees are thin and appear unhealthy. BMAD affected areas will have unhealthy merchantable trees removed during this operation*.

This is it. There was no mapping of dieback areas, no assessment of severity, no consideration of amelioration measures to apply in dieback areas, nothing. The Forestry Corporation had completed their Donaldson and Mount Lindesay trials so they knew what the outcome of this logging would be.

The applied logging prescription of "*BMAD affected areas will have unhealthy merchantable trees removed during this operation"* resulted in a logging intensity well in excess of the 35% Basal Area removal claimed in the harvesting plan and the maximum 40% allowed to be removed by the Integrated Forestry Operations Approval (IFOA, 1.5.10) silvicultural practices. What is effectively a "maximum economic utilisation" silvicultural regime is theoretically not allowed for by the IFOA.

Given that most eucalypt trees in the worst affected areas were sick, this prescription resulted in the removal of most of the biggest and healthiest trees remaining in the dieback areas. Some retained trees were killed in the post logging burn and others by the added stress of the logging operation.

Logging was intensive with excessive canopy removal, far in excess of what was legally allowed, though both the EPA and Forestry Corporation refused to assess tree retention or recognise the problem of BMAD. The post logging burn got out of control and burned into exclusion areas and into the Yabbra National Park. Approximately half of the Dunn's White Gum Endangered Ecological Community was burnt during the post-logging burn, which also intruded into rainforest boundaries in many places, killing a number of rainforest trees. Trees were still smoldering when inspected in late November. An initial assessment by NEFA after the logging resulted in the regulatory authorities issuing 6 Penalty Infringement Notices and 4 warnings for illegal logging.

NEFA found that the Forestry Corporation made no attempt to delineate the area affected by dieback, logged most of the healthiest trees remaining, and had no intention to rehabilitate the severely degraded "forest" left behind. From our audit (Pugh 2009), we reported that:

> *Most remaining healthy trees were removed from forests affected by Bell Miner Associated Dieback (resultant from previous logging operations), having significant degrading impacts on forest health, ecosystem functioning and viability and forest productivity. Many retained affected trees had then succumbed to the hot post-harvest burn. This logging and "management" is clearly not in accord with any of the principles of ecologically sustainable forest management as defined in the IFOA (breaches IFOA conditions 2.7.1 and 4.26).*
>
> *Bell Miner colony establishment was noted to be widespread throughout Compartments 162 and 163 and appeared to have been favoured by the logging and burning operations. It can be expected that the threatening process associated with colonies of this species (BMAD) will cause further deaths of trees, severely retard forest recovery and result in the loss of substantial areas of threatened species' habitat in the mid to long-term.*

The forestry operations greatly compounded the existing BMAD problems and left the dieback areas in a parlous state. By no stretch of anyone's imagination can logging of these dieback areas be considered "ecologically sustainable". As is particularly obvious in compartment 163, logging was undertaken in dieback areas in contravention of silvicultural requirements to apply single tree selection, retain 60% of basal area of trees above 20cm dbh, and concentrate growth on the more vigorous trees while promoting low level site disturbance for regeneration. Rather logging was based on a maximum economic utilization basis. The outcomes from this logging and burning of the dieback areas were significant reductions in canopy cover, further degradation of the understorey, and prolific weed growth, particularly of lantana.

In EPA's response (Simon Smith, DECCW, 19/5/2010) they dismissed NEFA's complaints regarding BMAD on the spurious grounds that the logging, burning and subsequent weed proliferation that occurred in and adjacent to an existing BMAD area could not be proved to have affected it:

> *DECCW notes your concerns regarding Bell Miner Associated Dieback (BMAD) and the principles of ecologically sustainable forest management. It is noted however that the NSW Scientific Committee's determination in relation to broad-scale canopy dieback associated with psyllids and Bell Miners "involves interactions between habitat fragmentation, logging, nutrient enrichment, altered fire regimes and weed-invasion". The Scientific Committee's determination also notes that "at present, no single cause explains this form of dieback. And it appears that 'Forest eucalypt associated with over-abundant psyllids and Bell Miners' cannot be arrested by controlling a single factor". An Inter-agency BMAD working group is working to improve knowledge on the interrelation of land management activities and the prevalence of BMAD.*
>
> ...
>
> *As noted above, the NSW Scientific Committee's determination notes that there is inadequate information available to determine if Bell Miner populations and Bell Miner associated Dieback has been favoured by these logging and burning operations.*

This is an abomination of the "Precautionary Principle" in that lack of certainty about the interaction of known causative agents of BMAD is used to justify undertaking activities known to contribute to dieback. What is most reprehensible is that EPA (DECCW) did not consider that the undertaking of activities that were likely to aggravate the BMAD, a Key Threatening Process, even warranted documenting and monitoring.

**ABOVE & BELOW: LOGGED BMAD. YABBRA 2009**

Since then BMAD has expanded to affect the whole logging area and has killed many of the retained trees, a process that is still continuing. The Bell Miners have also spread into patches

excluded from logging. There is poor regeneration of eucalypts and prolific regeneration of wattles. Like at Donaldson and Mt. Lindesay the full ramifications will not become apparent until the patchy eucalypts reach pole size and begin to be affected by BMAD and the wattles senesce.

Despite BMAD and lantana being emphasized in our audit, and on a site inspection with Forests NSW's CEO Nick Roberts, in Forests NSW's (2010) subsequent "Rehabilitation and Monitoring Plan, Compartments 162 and 163 Yabbra State Forest No 394" there was no mention what-so-ever of the dieback issue, no delineation of problem areas, and no identification of rehabilitation measures relevant to the problem. There is no identification of problem and noxious weeds, not even a mention of Lantana. This plan was endorsed by the EPA (DECCW).

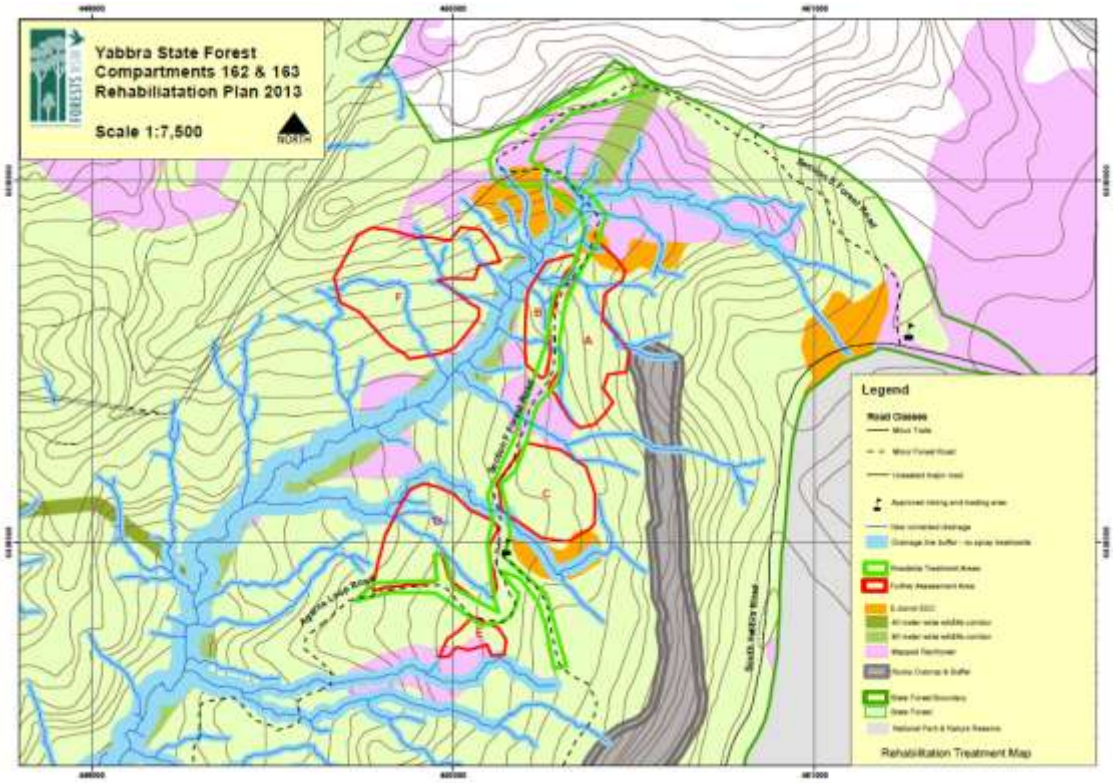
There were generic prescriptions for enrichment plantings with eucalypts and Hoop Pine should sites requiring rehabilitation be identified, though no such sites were identified. There was also an intention to "*Introduce and maintain low intensity fire regime into the grassy forest areas on 3-5 year cycle",* though this is inappropriate in eucalypt regrowth and in areas that naturally have a rainforest understorey. Given that most of the understorey in the dieback areas is now thick weeds, with a scattering of eucalypt seedling which have little chance of out-competing the lantana, the forest is in a parlous state. If they burn it again they will just kill the eucalypt seedlings. The only commitment is to some unspecified monitoring. The plan was effectively to abandon the forest and ignore it as it died

Following NEFA's complaint about the dying forest, Forestry Corporation's CEO Nick Roberts, Regional Manager Craig Busby, and Dean Kearney inspected the forest on 13 December 2012 in company with NEFA. On that inspection the Forestry Corporation agreed there was poor regeneration, and undertook to implement rehabilitation works to control weeds and plant trees in areas of poor regeneration.

The Forestry Corporation subsequently prepared another plan. The January 2013 "Rehabilitation Plan 2013 Comaprtments (sic) 162&163 Yabbra State Forest Urbenville Management Area" states:

> *A follow up inspection by FNSW in December 2012 determined that some areas of the forest were not fully stocked with hardwood regrowth and that some areas of heavy weed burden persisted in the compartments.*
>
> *...*
>
> *Roadside areas with large clumping lantana will be sprayed using high concentration, low volume technique (splatter gun). Occurrences of crofton weed, nodding thistle and moth vine will be also treated with spray application of herbicide. Areas for treatment will be marked in the field during January for herbicide application during late January – early February.*
>
> *In areas where overstorey canopy is sparse it was determined that traversing to identify understocked areas or areas with high weed loads would be undertaken. A treatment involving either back pack spraying or cut & spray of lantana stumps with enrichment planting with eucalypt species will be applied as determined appropriate. Detailed assessments will be undertaken during January with treatments applied as appropriate during late January – early February.*

**ABOVE & BELOW: BMAD AFFECTED FOREST 3 YEARS AFTER LOGGING. YABBRA 2012.**




The Forestry Corporation's rehabilitation plan identified 6 areas for rehabilitation work, though excluded large areas to the south around Agarns Loop Road that were similarly degraded for budgetary reasons. There were a variety of deficiencies in the plan, most astoundingly that that there was no systematic assessment to identify all BMAD areas and that it totally ignored the issue of BMAD. NEFA said in response (28/1/2013):

> *Bell Miner Associated Dieback is the principal process affecting these forests. BMAD will have the most significant affect on the success of regeneration. I am astounded that, as with Forests NSW's Rehabilitation and Monitoring Plan, there is no mention or consideration of BMAD. I don't understand how you can prepare a Rehabilitation Plan for the site without accounting for this influence. A plan that ignores the effects of BMAD is doomed to fail.*
>
> ***As well as recognising the widespread nature of Bell Miner Associated Dieback, it is essential to monitor Bell Miner populations and how they change as rehabilitation works and regeneration progress. If the works are not successful in controlling Bell Miners they are doomed to fail.***

Dean Kearney responded (24/4/2013):

> *We have not focused on BMAD in this plan, as it has been prepared as an operational plan aimed at reducing weeds and establishing an stocking of appropriate tree species.*
>
> *...*
>
> *The designation of areas for detailed survey and remedial treatment identified in the plan reflects observations from field inspections, air-photo interpretation and consideration of the budget available to undertake any rehabilitation works. It is appropriate that operational plans be made with due consideration of all these factors...*

The road was reopened and some roadside spraying was undertaken along sections of the road. Nothing has been done since. The roadside spraying was limited to within a couple of metres of some sections of Agarns Loop Road, with patchy results and many sprayed clumps now

regenerating. It is now 4 and a half years since Forests NSW undertook logging operations in compartments 162 and 163 of Yabbra State Forest, over a year since the Forestry Corporation undertook to commence “urgent” rehabilitation works, and the remnants from the original forest continue to die.

It is astounding that for almost 100 years the Forestry Corporation has got away pretending that BMAD doesn’t exist when undertaking logging and post-logging rehabilitation in the Border Ranges region. While-ever the Forestry Corporation are allowed to persist with their intentional ignorance, the problem of BMAD will continue to worsen at an accelerating rate.

> **As shown in Yabbra State Forest, the Forestry Corporation have been targeting BMAD affected forests for intensified logging without attempting any rehabilitation works in a manner that they know will promote lantana, Bell Miners and BMAD. While they now give token recognition to the existence of BMAD in their harvesting plans they still refuse to map its extent, refuse to acknowledge the presence of lantana or BMAD in their rehabilitation plans and refuse to undertake rehabilitation unless forced to. They do this because the EPA allows them to get away with it.**

**ABOVE AND BELOW: BMAD AFFECTED FOREST EXCLUDED FROM FORESTRY CORPORATION’S PROPOSED 2013 REHABILITATION AREAS ON GROUNDS OF COST. YABBRA 2014.**






## 6.4. CREEKS BEND

The Office of Environment and Heritage undertook lantana control at Sheepstation Creek in the Border Ranges National Park as part of the BMAD Working Group trials, though results from this trial have not been obtained. The aim of the trial was:

- *Remove 10 hectares of medium and dense Lantana in moist sclerophyll forest using overspray and spatter methods of herbicide application.*
- *Remove 10 hectares of light Lantana in moist sclerophyll forest using hand pulling and cut and paste*
- *Remove 5 hectares of very light Lantana in grassy open forest using fire with hebicide follow-up as necessary.*

The lantana was apparently not subject to ongoing control and reinvaded the site (J. Morrison pers. comm.)

The Office of Environment and Heritage also undertook lantana control in a BMAD affected area they inherited from Forestry Corporation in the Iron Pot Creek Valley in Toonumbar National Park, while this has apparently been successful it has not been publicly documented.

Nearby landowners also undertook lantana control on their property Creeks Bend in the Iron Pot Creek Valley as part of the BMAD Working Group trials. The aim was to remove 50% of 60 hectares of medium to dense Lantana using the splatter gun method. Somerville et. al. (2011) note:

> *We set about testing the hypothesis that removing Lantana might play a vital role in breaking the BMAD cycle and allowing healthy regeneration of native forests to occur. We hoped that this work might help forest managers better respond to the appearance of BMAD in the future and ameliorate one of the major threats affecting the health of our eucalypt forests.*
>
> *...*
>
> *In 2005 before Lantana treatment commenced, Bell Miners were found throughout the forested areas, with only three small areas that were Bell Miner-free. Over time, we could see and hear that Bell Miners had moved from many areas of previously degraded forest after the Lantana was removed and forest structure and plant diversity improved. Areas of the forest that had been filled with constant Bell Miner calls had become quiet.*
>
> *...*
>
> *The work on Creek's Bend since 2005, however, indicates that native forest badly degraded by BMAD can show substantial levels of recovery and the return of complex structure and species biodiversity if the Lantana understorey is removed. This work adds weight to our initial hypothesis that the cycle of decline might be interrupted if one of the key factors, in this case the exotic weed Lantana, was removed. ... our impression is that Bell Miner colonies can also leave an area about 12 months after it has been cleared of Lantana and forest regeneration is underway.*

Somerville et. al. (2011) estimated the cost of their works as $250 per hectare, noting *"As techniques are refined, the cost per hectare is decreasing"*.

Through their involvement on the BMAD Working Group, the Forestry Corporation are well aware of the successful results obtained in the Iron Pot Creek valley by simply controlling lantana, and indeed are undertaking manual lantana control works themselves in the Iron Pot Creek valley. It

would seem that rather than rehabilitating BMAD forests elsewhere the Forestry Corporation is intentionally destroying native ecosystems because they don't care about the outcomes, or so that they can later claim a need to convert them to plantations.

**The lantana control works on the private property at Creeks Bend provide strong evidence that a sustainable means of dealing with BMAD and restoring ecosystem health may be as simple as removing lantana in a manner that avoids intensive disturbance to native species and soils.**

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