Submission No 154

INQUIRY INTO KOALA POPULATIONS AND HABITAT IN NEW SOUTH WALES

Organisation: North East Forest Alliance

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North East Forest Alliance submission to Legislative Council Inquiry: Koala populations and habitat in New South Wales

Dailan Pugh, North East Forest Alliance, August 2019

The NSW Parliament's will to safeguard threatened native species dates back to 1918, with this intent unequivocally reaffirmed with the passage of the Endangered Fauna (Interim Protection) Act in 1991. This legislation was specifically in response to the Forestry Commission's logging of a "veritable forest dependent zoo" at Chaelundi, and the judge's finding that an array of endangered species, including the Koala, would be taken, killed, disturbed or injured.

The NSW Parliament has subsequently reaffirmed this desire to protect threatened species on many occasions, most significantly for Koalas with the introduction of State Environmental Planning Policy No. 44 (Koala Habitat Protection) in 1995, which focussed on identifying and zoning core Koala habitat for protection on private lands.

Despite this intent, and the expenditure of millions of dollars of public monies, Koala populations have continued to decline at an accelerating rate with a conservative 26% decline in NSW, and a 50% decline on the North Coast, over the past 15-21 years.

What has gone wrong? This submission identifies that the accelerating decline is due to a bureaucratic malaise and often downright hostility to meeting legal obligations for Koala conservation. Across all tenures the intent of various legislation has never been implemented. While Councils fumble and agencies procrastinate, vested interests intervene to maintain their ability to degrade, destroy and clear Koala habitat at their whim.

We have continued to clear and fragment core Koala habitat through land clearing and urban expansion, and have degraded it through logging. And there is no end in sight. As habitat and food trees are cleared and logged the Koala populations are declining and their social systems breaking down. As Koalas attempt to move between the remaining patches of habitat they are suffering increased mortalities due to vehicle collisions and dog attacks. As they become more inbred and stressed they are increasingly vulnerable to diseases.

Declining rainfalls and increasing temperatures due to climate heating are compounding these effects by reducing the nutritional quality and moisture content of gum leaves, causing heat stress, aggravating eucalypt dieback, and increasing the frequency and intensity of droughts and bushfires.

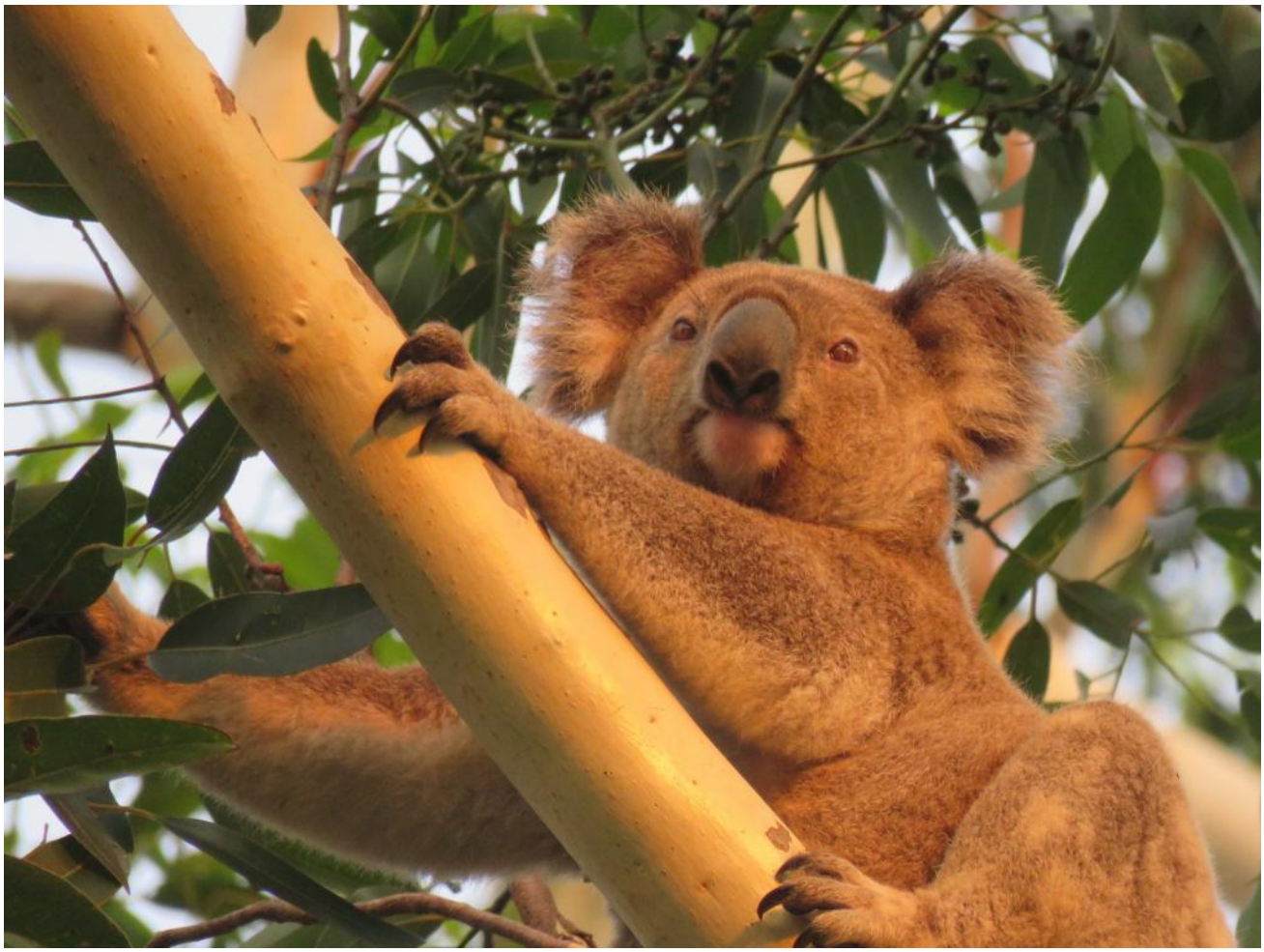
It is still possible to stabilise and enhance Koala populations if we stop clearing and degrading their habitat and start repairing it.

If there is a genuine desire to stop the slide of NSWs Koalas into extinction then the primary requirement is to urgently identify, protect and rehabilitate occupied and potential Koala habitat, identify wildlife corridors to facilitate dispersal within metapopulations, and identify priority areas for replanting.

The preparation of Comprehensive Koala Plans of Management in accordance with SEPP 44 is the most efficient and effective means of identifying important Koala habitat and detailing appropriate development controls. To avoid artificial borders and incomplete coverage it would be preferable to prepare Comprehensive Koala Plans of Management for OEH Areas of Regional Koala Significance (ARKS), or sub-populations within them, and ideally they would cover all land tenures.

Modelling needs to be undertaken to identify likely future climate change refuges to prioritise for protection.

What has been lacking so far is a genuine political will to protect Koalas. The current NSW Premier needs to direct her Ministers and their agencies to immediately identify and protect remaining core Koala habitat and habitat linkages across all tenures. This will require the allocation of significant resources to undertake the required mapping of Koala habitat and the provision of financial incentives and assistance to private landowners to conserve core Koala habitat in perpetuity. There is also a need to rehabilitate degraded habitat and to replant essential habitat linkages.



RECOMMENDATIONS

1 (a) the status of koala populations and koala habitat in New South Wales, including trends, key threats, resource availability, adequacy of protections and areas for further research,

With Koala populations declining by 50% in north-east NSW over the past 20 years it is evident that recovery actions have been ineffectual. Contrary to the NSW Koala recovery plan:

- **with virtually no protection for Koala habitat from development, clearing or logging on private lands, and ineffectual protection on State Forests, there is little progress with conserving koalas in their existing habitat (Objective 1)**
- **only 5 Comprehensive Koala Plans of Management have been prepared, and only 2 of these identify core Koala habitat for protection (Action 1.13)**
- **there is still no single definition of koala habitat and various lists of koala food trees are incomplete and inconsistent (Action 1.15)**
- **there has been limited inclusion of Koala habitat into LEPs, and the Government and DoP intervened to stop north coast Councils incorporating koala protection into their new LEPs. (Actions 1.19, 1.20, Specific objective 1c)**
- **there is still no accepted regional plan for Koalas covering State forests and protection for Koalas is grossly inadequate and declining (Action 1.24)**
- **there has been no credible assessment by State agencies of the impacts of logging on Koalas, and no attempt to assess the effectiveness of mitigation measures, with new prescriptions known to be inadequate adopted without any attempt to assess their effectiveness (Objective 3, Action 3.6).**

The key messages from this review are that Koalas:

- **have requirements for specific tree species for food (including non-eucalypts), that vary on a population basis and are not necessarily included in many feed species lists, requiring allowance for regional variations.**
- **have requirements for other trees for roosting that need to be incorporated into tree retention requirements.**
- **preferentially select larger trees for feeding, requiring the retention of larger trees as feed trees.**
- **are not reliant upon tree hollows and so can tolerate a larger degree of habitat degradation than many other arboreal mammals.**
- **are negatively affected by clearing and logging that reduces the availability and size of feed trees, and associated roost trees.**
- **need to expand their home ranges to obtain equivalent resources and spend more time on the ground moving between feed trees in degraded habitat, which reduces an areas carry capacity and makes Koalas more vulnerable to predation.**
- **have thresholds below which mortality exceeds recruitment and source habitat becomes sink habitat, with further degradation leading to the loss of populations.**
- **are subject to stress when habitat becomes too degraded, increasing their vulnerability to disease**
- **are vulnerable to the increased drying and risk of bushfires associated with conversion of mature forests to regrowth, as well as changes due to climate heating.**

1 (b) (i) the impacts on koalas and koala habitat from the Coastal Integrated Forestry Operations Approvals and Regional Forest Agreements

The Forestry Corporation has a long history of avoiding its legal obligations to identify and protect Koala High Use Areas. The new prescription removes this need while only retaining token feed trees in modelled habitat. It is self-evident that if the NSW Government has a genuine intention to stop and reverse the ongoing decline of Koalas on public lands it needs to initiate a moratorium on any further clearing or logging of potential Koala habitat on public land while:

1. **undertaking rapid systematic surveys for Koalas with independent experts on a metapopulation basis to identify extant Koala populations, delineate core Koala habitat, and better define regional food preferences.**
2. **ensuring core Koala habitat is identified and protected by either transfer to National Parks or inclusion in Forest Management Zone 2.**
3. **ensuring potential Koala habitat and corridors are identified and subject to retention and restoration of adequate food trees.**
4. **only allowing site specific proposals for logging of potential Koala habitat to occur where they have been subject to surveys by independent and competent professionals applying, at least in part, repeatable methodologies, and reviews by independent Koala experts.**

1 (b) (ii) the impacts on koalas and koala habitat from the Private Native Forestry Code of Practice

There is still no meaningful protection for Koalas on private lands subject to logging. If the Government is serious about the survival of Koalas then meaningful measures need to be applied to stop the open-season on Koala habitat on private properties. This must apply a precautionary approach, involving:

- **Providing greater transparency and public accountability by requiring Development Applications for PNF as is required for all other significant developments.**
- **Requiring pre-logging surveys to identify the distribution of Koalas, and other threatened species, and core Koala habitat (where it hasn't been identified in a CKPoM).**
- **Maintaining the prohibition on logging of core Koala habitat, and fast-tracking its identification in CKPoMs;**
- **Adoption of precautionary prescriptions in potential Koala habitat and habitat linkages that require the retention and restoration of multi age forests and mature feed trees.**
- **Subjecting prescriptions to scientific scrutiny and monitoring to assess their effectiveness and identify needed improvements.**

1 (b) (iii) the impacts on koalas and koala habitat from the old growth forest remapping and rezoning program

Irrespective of definitions and thresholds, those stands mapped as oldgrowth are the most intact stands remaining on State Forests as they are dominated by old and mature trees and have not been logged for at least 20 years (if ever). The loss of these key refugia, combined with the loss of Koala High Use Areas and the other significant reductions in habitat retention in the new Coastal IFOA are expected to have significant impacts on Koalas in the forests affected.

Having agreed to these areas being protected, out of greed the logging industry wants them back. According to the Forestry Corporation's own data there is no resource shortfall and no justification for removing these forests from the already inadequate reserve system for logging. The NSW Government should immediately rule out this assault on north east NSW's oldgrowth, rainforest and CAR reserve system.

1 (c) the effectiveness of State Environmental Planning Policy 44 - Koala Habitat Protection, the NSW Koala Strategy and the Biodiversity Conservation Act 2016, including the threatened species provisions and associated regulations, in protecting koala habitat and responding to key threats,

SEPP 44 is sound in principle, though has been poorly implemented. The preparation of Comprehensive Koala Plans of Management in accordance with SEPP 44 is the most efficient and effective means of identifying potential Koala habitat and habitat links, identifying core Koala Habitat for protection, and detailing appropriate development controls. It is essential that core Koala habitat be identified up-front in the planning process if there is an intent to protect it.

Core Koala Habitat needs to be defined to encompass recent sightings OR evidence of Koala presence (i.e. scats, distinctive scratch marks) OR historical records of a population. It is essential that areas of "land with a resident population of koalas", and high quality habitat with evidence of an historical presence, are given the highest protection. Allowance needs to be made for the inclusion of locally significant feed trees or attributes.

The NSW Government needs to take on the responsibility for identifying and mapping potential and core Koala habitat (including habitat links), provide clear guidelines for the implementation of SEPP 44 and allocate sufficient resources to complete the preparation and finalisation of Comprehensive Koala Plans of Management within 10 years.

To avoid artificial borders and incomplete coverage it would be preferable to prepare Comprehensive Koala Plans of Management for OEH Areas of Regional Koala Significance (ARKS), or sub-populations within them (Paull et. al. 2019). These may comprise a number of Local Government Areas or only part of one. Ideally they would cover all land tenures and identify core Koala habitat, potential Koala habitat, habitat linkages and priority areas for revegetation.

The need to comply with the aims of SEPP 44 and prepare site specific IKPoMs must be one of the first steps in any planning process by all approval authorities. IKPoMs need to be prepared independently of developers and subject to review by an independent expert panel. IKPoMs should be required to be compatible with CKPoMs (including exhibited drafts).

In accordance with SEPP 44, Councils should be encouraged to protect Core Koala Habitat in E2 zones in Local Environment Plans, on public lands it should preferably be incorporated into National Parks, or where this is not appropriate included in FMZ2 zones on State Forests. The ability of the northern Councils to protect identified Koala habitat in Environmental Zones should be reinstated.

Landowners need to be provided with incentives for long term protection and enhancement of core Koala Habitat and corridors.

1 (d) identification of key areas of koala habitat on private and public land that should be protected, including areas currently at risk of logging or clearing, and the likely impacts of climate change on koalas and koala distribution

In 2018 the Government proposed 12 new Koala Reserves from State Forests, though these were mostly selected from areas where logging was already excluded, or where the forest was severely affected by dieback. Only 3 of the chosen areas are considered to be justifiable on the basis of Koala habitat. Regrettably the only criteria applied by the NSW Government appears to have been selecting non-commercial areas of State Forests, irrespective of Koala occupancy.

In 2017 OEH analysed Koala records to identify areas of "*currently known significant koala occupancy that indicate clusters of resident populations known as Koala Hubs*". A total of 567 Hubs were identified. totalling 101768 hectares, or around 0.13% of NSW. These occur across all tenures, with 19,785ha on State Forests and 66,162ha on private lands. These are by definition key areas of koala habitat that should be protected, though they are currently being targeted for logging on State forests.

WWF (Paull et. al. 2019) applied a similar method, using broader criteria, to identify 341,776 hectares of State forests as high priorities for inclusion in the reserve system to protect koalas. In addition 71,094 hectares of Crown, NSW Government and Australian Government lands is identified as known high priorities for the protection in national parks or to be managed as components of regional systems of retained habitat.

One million hectares of lands within the WWF Koala Hubs occur on private lands, encompassing some 508,265 hectares of potential priority habitat for koalas, which "*need to be the immediate focus of measures and incentives to protect koala habitat from clearing, urbanisation, private native forest logging, further fragmentation and other threats. Within these areas there is a need to identify and protect core koala habitat and increase connectivity between patches*".

This is considered to be the best available data for identifying Koala reserves on the scale needed based on Koala records. This confirms the proposed Great Koala National Park as the highest priority single area in NSW for Koala protection.

NEFA's surveys, and those of others, have so far proven Royal Camp, Carwong, Gibberagee and Braemar State Forests on the Richmond River lowlands to contain significant populations of Koalas. The areas of significant Koala occupancy all adjoin the Richmond River floodplain. These lowland forests are dominated by Spotted Gum with significant numbers of the Koala preferred feed trees of grey gums, grey box and/or red gums. The evidence is that the remnant forests on the Richmond River lowlands are, at least in part, of regional, or national, significance for Koalas.

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1 (a) the status of koala populations and koala habitat in New South Wales, including trends, key threats, resource availability, adequacy of protections and areas for further research,

Core Koala habitat is defined simply as an area of land with a resident population of koalas. If the Government was serious about saving the Koala from extinction they would have protected core Koala habitat decades ago, as was the promise of State Environmental Planning Policy (SEPP) 44 in 1995. It is the key requirement and yet very little progress has been made. The issue of how to identify core Koala habitat is thus fundamental for the protection of Koalas in NSW. The act of actually doing it is the litmus test of the Government's resolve to turn over a new leaf.

Januchowski *et. al.* (2008) recommendations for a fragmented landscape around Ballarat are applicable to most heavily cleared landscapes:

> *If koalas are to be effectively conserved in Ballarat, it is critical to (i) protect remaining core areas of high-quality habitat, including regenerating areas; (ii) protect scattered habitat patches which provide connectivity; and (iii) develop and implement habitat restoration programmes to improve habitat connectivity and enhance opportunities for safe koala movement between habitat patches intersected by main roads.*

Stable populations of Koalas have overlapping home ranges, with a dominant male's range encompassing a number of females. Depending on the habitat quality Koalas have can have widely varying home ranges, from less than a hectare to over 100ha (Moore *et. al.* 2004). More typical of high quality forest areas, for his study area in the Brisbane Ranges National Park (west of Melbourne) Hindell (1984) identified home ranges for males with an average size of 3.14ha (1.3-4.34ha) and for females 2.08ha (1.13-3.42ha).

Habitat quality depends on the availability of high quality food resources. There are various thresholds, including food availability, that make vegetation unsuitable as habitat. In habitats with limited high quality food resources animals require larger areas to forage in, spend more time looking for food, and have low reproductive success, meaning that population persistence depends on immigrants from elsewhere (Norton 1987). Where local reproduction is not sufficient to balance local mortality it is termed sink habitat.

Where high quality food resources are plentiful population densities vary with other factors, such as forest structure, the amount of toxic chemicals that trees produce in their foliage, predation and the constraints of social interactions between individuals and groups of animals (Norton 1987, Moore *et. al.* 2004). When habitats are net exporters of individuals they are termed source habitat. Moore *and Foley* (2000) identify that "*areas containing very high quality foliage might be vital as sources of dispersing animals to maintain populations in surrounding areas*".

Because Koalas have few natural predators, do not have specialised requirements for shelter and do not appear to be limited by interspecific competition, it has been proposed that food availability is the primary natural determinant of koala habitat quality (Moore and Foley 2000). Koalas have localised preferences for certain tree species, and preferences for individual, particularly larger,

trees. They prefer areas with a variety of palatable tree species and may vary species on a seasonal basis. Koalas also utilise other species for shade and shelter.

Preferred feed trees can be naturally patchy, though due to clearing and logging habitat is becoming increasingly degraded and fragmented, meaning that Koalas are having to move increasing distances through unsuitable habitat to find food and maintain social interactions. They are thus more vulnerable to predation by dingos or dogs, and in more built-up areas vehicle strikes. This also makes them more susceptible to stress and disease. Davies *et. al.* (2014) identify:

> *Wildlife species have a physiological response to changes in habitat resources and environmental conditions, reflected by variations in stress hormone levels ... Sources of stress include biotic factors (predation, competition, social dynamics), extremes in physical factors (temperature, salinity) and climatic factors (drought, storms) ... Stressors can impact on both physical and biotic components of an organism's environment and, depending on their pervasiveness, magnitude and frequency, can profoundly influence the fitness of individuals via costs to health, reproduction and survival ... Ultimately, stressors can affect population viability, distribution and extinction risk.*

Koalas are primarily reliant on moisture they obtain from leaves, which means that they often retreat to areas with higher soil moisture during dry periods and droughts, and in extreme conditions require access to water to drink . This makes them particularly vulnerable to climate change and the increasing frequency and severity of droughts and fires. Climate change will also have increasing effects on leaf nutrients and toxins, reducing their palatability, and the distribution of eucalypts themselves. Irrespective of direct human impacts, Koalas are becoming increasingly vulnerable to indirect impacts.

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1 (a) 1. Legal Status

The Koala (Phascolarctos cinereus) (combined populations of Queensland, New South Wales and the Australian Capital Territory) is listed as 'Vulnerable' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, and as 'vulnerable to extinction' under the NSW *Biodiversity Conservation Act 2016.*

There is no nationally adopted Recovery Plan, with one meant to be developed and "*to commence following the expiration of the National Koala Conservation and Management Strategy in 2014*". There is a 2012 '*Approved Conservation Advice for* Phascolarctos cinereus *(combined populations in Queensland, New South Wales and the Australian Capital Territory)'.* There is also a 2008 NSW Recovery Plan for the Koala.

Regrettably both the Conservation and Management Strategy and NSW Recovery Plan have effectively expired and neither the NSW nor Commonwealth Governments have replaced them with contemporary plans. Never-the-less the relevant key requirements from both approaches can be considered to be:

- identify and protect important habitat areas (Conservation Strategy; Actions 1.02, 1.03, 1.04, 'Habitat Loss, Disturbance and Modification' actions, Recovery Plan; Objective 1**)**
- identify improved and standardised survey methods (Conservation Strategy; Action 1.06)
- monitor and review the effectiveness of mitigation measures (Conservation Strategy; Action 1.08. 'Habitat Loss, Disturbance and Modification' actions Recovery Plan Objective 3, Action 3.6)

The Conservation and Management Strategy identifies:

> *Loss of habitat is the major threat to the koala in Queensland and New South Wales, and is the primary factor responsible for declining populations in those states....*
>
> *Under the strategy it is a high priority to identify important habitat areas and protect them from clearing, through planning and legislative tools and other measures such as covenanting. ... It is important to consider that there is a significant lag-time before successfully replanted habitat can support koalas.*

Degradation of habitat can result from: some logging regimes; thinning of timber during property development; destruction of undergrowth and mid-storey shelter trees; and other disturbances, such as regular burning, excessive nutrient input or the introduction of weeds. Degraded habitats are capable of supporting fewer koalas than undisturbed habitats.

The Conservation and Management Strategy identifies as actions:

Action 1.02 Assess, develop and implement options for protecting priority Koala habitat on public lands using legislation, covenants or agreements, or by new acquisition of koala habitat

Action 1.03 Assess, develop and implement options for protecting koala habitat on private lands.

•Develop incentive-based mechanisms for koala conservation on private lands.

•Implement incentive-based mechanisms for koala conservation on private lands.

•Establish covenants over koala habitat via cooperation with local government, community and business.

Action 1.04 Prioritise conservation of populations under immediate pressure.

•Workshop of experts to identify where existing koala populations are already experiencing significant loss of habitat and to identify immediate and short-term actions to secure their status.

Action 1.06 Develop standard monitoring/habitat assessment protocols.

There is some inconsistency and disagreement over how koala populations should be surveyed and mapped.

•Develop consistent protocols that enable population numbers or density to be compared between the same place at different times and between different habitats.

Action 1.08 Establish or continue surveying and monitoring programs.

Monitoring fulfils two important functions: evaluating population status so that the relative need for management can be assessed; and evaluating population trends so that the efficacy of management actions can be assessed. The scale at which these are undertaken must be appropriate to the scale of management....

In relation to 'Habitat Loss, Disturbance and Modification' the Conservation Advice includes:

- *Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.*
- *Identify populations of high conservation priority.*
- *Investigate formal conservation arrangements, management agreements and covenants on private land, and for Crown and private land investigate and/or secure inclusion in reserve tenure if possible.*
- *Manage any other known, potential or emerging threats such a Bell Miner Associated Dieback or Eucalyptus rust.*

The 2008 NSW *Recovery plan for the koala* (Phascolarctos cinereus) identifies:

Smith and Andrews (1997) found that koala activity was greater in structurally diverse forest with the majority of trees 50–80 cm diameter at breast height (dbh). White (1999) found that koalas preferentially utilise trees between 25.5–80 cm dbh, with under-utilisation of trees less than 25.5 cm dbh. Lunney et al. (2000a) found that the koalas in the Coffs Harbour area favoured trees of 50–60 cm dbh and greater than 120 cm dbh. Some groundcover vegetation and other features such as hollow logs, are also useful to provide shelter while on

the ground and refuge in extreme weather conditions, particularly in western KMAs (R. Kavanagh, State Forests NSW, pers. comm.).

In the Comprehensive Regional Assessment, undertaken jointly between the Commonwealth and NSW Governments in north-east NSW, a significant threat to Koalas was identified (Environment Australia 1999) as *"Logging that fails to retain stems in the 30-80 DBH size class".*

The NSW Recovery Plan includes as objectives and actions:

Objective 1: Conserve koalas in their existing habitat

Specific objective 1a: Identify and conserve habitat important for koala conservation

Action 1.13

DECC will work with councils to assist in the preparation of Comprehensive Koala Plans of Management under SEPP 44.

Performance criterion 1.13

Number of Koala Recovery Plans completed.

Action 1.15

Consideration will be given to having a single definition of koala habitat, instead of 'core' and 'potential' habitat and to expanding the list of koala food trees.

Performance criterion 1.15

Tree species list amended for SEPP 44 and the definition of 'koala habitat' determined and disseminated.

Action 1.19

DECC, together with DoP, will work with councils and catchment management authorities to assist them in developing koala habitat protection measures for incorporation in relevant local environmental plans (LEPs), and regional natural resource and vegetation management plans.

Performance criterion 1.19

DECC initiated discussions with relevant CMAs and councils regarding adequate incorporation of protection measures for koalas into regional natural resource and vegetation management plans, including catchment action plans and LEPs where relevant.

Action 1.20

DECC will approach DoP to jointly develop and provide specific advice to local government about the incorporation of koala protection into their new LEPs, currently under development.

Performance criterion 1.20

DECC initiated discussions with DoP regarding adequate incorporation of koala protection into LEPs. Advice to local governments re incorporating koala protection measures into revised LEPs developed jointly by DECC and DoP.

Action 1.24

DECC will approach Forests NSW (DPI) to collaborate in developing policy and practice consistent with the NSW Koala Recovery Plan; exchange information, given that koalas move across tenure boundaries; and work within the context of agreed regional forest agreements.

Performance criterion 1.24

DECC initiated discussions with DPI on the basis of this recovery plan. An agreed policy produced for exchanging information between DECC and DPI, working across boundaries and contributing to a plan that covers a landscape cross-tenure.

Specific objective 1c: Integrate koala habitat conservation into local and state government planning processes

Objective 3: Develop a better understanding of the conservation biology of koalas

Action 3.6
Investigate the relative importance of different threats to koalas, how to ameliorate them and the effectiveness of mitigation measures.
Performance criterion 3.6
Research/study undertaken assessing the threats to koalas and their relative importance, the ameliorative measures for these threats and their effectiveness.
Results disseminated/published in standard scientific arenas.

With Koala populations declining by 50% in north-east NSW over the past 20 years it is evident that recovery actions have been ineffectual. Contrary to the NSW Koala recovery plan:

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1 (a) 2. Tree Species Preference

Tree species are the primary determinant of Koala habitat. It is apparent that Koalas have localised preferences for particular species of eucalypts and that use of a species varies across the landscape. Past attempts to create definitive lists of feed trees for planning and regulation have invariably excluded regionally significant feed trees. Which means that key food resources often remain unrecognised and unprotected. While it is necessary to highlight known feed species, preferably on a regional basis, it is essential to always allow for new species found to be significant feed trees regionally to be added. This must include non-eucalypts in regions where they are known to be significant food sources (i.e. Forest Oak around Coffs Harbour).

It is also important to recognise that Koalas often have requirements for other species, including small understorey trees, for resting and shelter, particularly in extreme weather events. These also need to be identified and protected on a regional basis.

Koalas and Greater Gliders feed primarily on eucalypts, and for both Common Brush-tail Possum and Common Ringtail Possum eucalypts can comprise the majority of some animal's diets. The

Koala feeds almost exclusively on eucalypt leaves from selected individuals of a limited range of species, predominantly from the eucalypt subgenera *Symphyomyrtus*, which contains roughly 500 species (mainly gums, ironbarks and boxes). Their diet has been described as 'seemingly inhospitable', with Cork *et. al.* (1983) commenting:

> *... it is not only low in protein and high in cell-wall (fibre) content but also contains essential oils, which are potentially toxic, and high levels of tannins, which may reduce the availability of other nutrients*

It is well known that Koalas have local preferences for certain species of eucalypts (Hindell and Lee 1987, Phillips 1990, Lunney et. al. 1999, Moore and Foley 2000, Phillips *et. al.* 2000, Smith 2004, Moore *et. al.* 2004b, DeGabriel *et. al.* 2010, Gow-Carey 2012, Davies *et. al.* 2014,). Across their range, koalas have been observed eating or sitting in 120 different eucalypt species (Phillips 1990). Though they have also been recorded feeding extensively on other species (i.e. Brush Box, Forest Oak) at some sites (Lunney *et. al.* 1992, Moore and Foley 2000, Smith 2004).

In the Coffs Harbour area Lunney et. al. (1999) identify:

> *Tallowwood Eucalyptus microcorys was identified as the tree species most preferred by koalas in the Coffs Harbour LGA. ... Tallowwood, however, was not the only tree species contributing to the distribution of koalas and to activity levels at survey sites in the LGA. A number of studies have shown that core koala habitat generally contains a primary tree species supported by 2 or 3 secondary species ... Other tree species identified as preferred trees were Swamp Mahogany E. robusta, Broad-leaved Paperbark Melaleuca quinquenervia, Flooded Gum E. grandis and Blackbutt E. pilularis.*

The importance of Forest Oak for Koalas near Coffs Harbour led Smith (2004) to state:

> *While koalas are occasionally known to feed on non-eucalypt species (Moore and Foley 2000) the presence of Allocasuarina in more scats than all other eucalypts with the exception of tallowwood is exceptional and may indicate an important dietary preference that should be taken into account in conservation planning.*

Koalas have been found to change their food preferences seasonally (Hindell and Lee 1987, Ellis *et. al.* 1995), and in response to droughts. It has been observed that Koalas eat young leaves before mature leaves, but despite this apparent preference for young foliage koalas still eat large amounts of mature foliage once they have eaten the available young foliage (Hindell 1984).

In her study area in south-east NSW Gow-Carey (2012) found that Koalas were not using many of the species outlined in the ‘Recovery Plan for the Koala (*Phascolarctos cinereus*)’ (DECC 2008) were not being utilised by koalas, noting "*The trees that are being utilised differ substantially to those listed as primary feed trees for the region, highlighting the need for localised assessment of habitat requirements in order to create informed plans of management*".

Phillips *et. al.* (2000) found that *E. robusta* and *E. parramattensis* must be considered as major limiting factors affecting the distribution and abundance of koalas in the Port Stephens area. They note that Drooping Red Gum *E. parramattensis,* has been largely overlooked in studies associated with the tree species preferences of koalas, which they consider may be due to their relatively limited geographic range in eastern Australia, and that the significance of Swamp Mahogany *E. robusta* has frequently been reported as a food tree species for koalas, though often downplayed. Phillips *et. al.* (2000) consider that these species "*highlight the confusion that exists concerning the importance of particular tree species to koalas*", noting:

> *... recurring debate over exactly what constitutes koala habitat and which are the most preferred tree species in a given area tends to both overshadow and undermine the more pressing need to effectively conserve it, an issue which is exacerbated by the absence of a scientifically credible approach to habitat assessments in the first instance.*
> *...*
> *We conclude by reiterating that the resolution of issues associated with the identification of significant food trees for koalas has long acted as an impediment to effective conservation and management of the species.*

Sluiter et. al. (2001) found:

> *Our results are consistent with the hypothesis that E. punctata and stringybarks (principally E. agglomerata) are the preferred dietary species of Campbelltown P. cinereus, and with the findings of Phillips and Callaghan (2000) that E. punctata and E. agglomerata were significantly preferred. In New South Wales the State Environmental Planning Policy 44 (SEPP 44) provides legislative controls over development of potential P. cinereus habitat. Whilst E. punctata is listed in the SEPP 44 as a recognised food tree, E. agglomerata is not. We believe that there is now strong evidence, from two separate studies, that E. agglomerata is a significant browse species, and therefore should be listed under Schedule 2 of SEPP 44 legislation. Other stringybark species may also prove to be important food sources in the Sydney region.*

Though plant species are only one of the factors affecting Koala's selection of trees for feeding as many species occur over a broad range of soil types but may only be preferentially utilised on one soil type. Moore *et. al.* (2004) use the example of populations of koalas residing in habitats derived from either shale or sandstone near Campbelltown, southwest of Sydney, where:

> *Not only were there more koalas in habitats derived from shale, but koalas preferred E. punctata and E. agglomerata when they grew on soils derived from shale but not when they grew on substrates derived from sandstone.*

Food tree diversity in an area has been identified as an important influence on Koala presence (Lunney *et. al.* 1992, Lunney et. al. 1999, Smith 2004, EPA 2016). Smith (2004) found "*koala scat abundance peaked in sites with three or more preferred food trees*", and found that "*koala scats and an average of more than four tree species per scat*", commenting:

> *Food tree diversity may be an important factor in forest habitats because it enables koalas to satisfy their nutritional requirements by selecting different tree species for different essential nutrients (water, protein, energy) and to avoid exceeding toxicity thresholds associated with individual tree species. Koalas are known to avoid tree species, individual trees and tree parts (mature leaves) which are high in toxins and to favour tree species, individual trees and tree parts (new leaf, flower) with high available protein and moisture levels*

In their review of variables affecting Koala distribution, the EPA (2016) found:

> *Limited areas of higher koala activity corresponded with; a higher abundance and diversity of local koala feed trees, ... Overall koala numbers, however, were most abundant in habitat areas with greater than 15% local koala feed trees in the canopy.*

While Koalas may prefer certain eucalypt species for feeding, tree size, water availability, site productivity, foliar nutrients, and foliar toxins all contribute to suitability of an individual tree for Koala food.

It is important to recognise that Koalas use trees for a variety of purposes other than food. They have been found to often use different trees for daytime resting and nighttime feeding (Mathews *et al.* 2007, Ellis *et. al.* 2013). Mathews *et al.* (2007) reported that while over half of daytime koala sightings for Port Stephens on the central coast of New South Wales involved either *E. robusta* or Smoothbarked Apple *Angophora costata*, at night time *E. robusta* and *E. parramattensis* were preferred by koalas for feeding purposes. Ellis *et. al.* 2013 identify that in *"Queensland koalas use various non-food species that provide a cooler microclimate and these trees play a key role in the koala's ability to survive extreme temperatures ... so failure to protect these roost trees is likely to compromise the long-term survival of koalas".*

In her study of Koalas on St. Bees Island (near Mackay) Ellis (2009) found:

> *... koalas need to adjust foraging activity to either ingest leaves with more water, come to the ground to drink water, reduce activity to lessen water loss, adjust metabolic profile to compensate for thermoregulatory pressures, or limit water loss by resting in canopy areas with shade. ... Such patterns conform to a model of koala habitat use and ranging activity that incorporates factors other than forage quality and leaf toxicity.*
>
> *...*
>
> *... the appearance of koalas in a food tree need not reveal foraging preference or activity since diurnal tree location is not necessarily identical to diurnal feeding tree use (Ellis et al. 1995; Pfeiffer et al. 2005). Although koalas have been observed sleeping in their feeding trees (Martin and Handasyde 1999), they often shelter in nonfood trees during the daytime (Ellis et al. 2002; Pfeiffer et al. 2005) and alter day roost on a regular basis. ... a koala's home range use also depends upon the location of nonfood trees.*

Briscoe et. al. (2014) found that Koalas use tree trunks for thermo-regulation in hot weather, noting "*Our results are consistent with, and may help explain, previous studies of koalas in more northern populations that found seasonal [18] and weather-dependent differences in tree use, with koalas using non-food trees more frequently during hot days*".

From their review of the use of vegetation mapping to identify Koala habitat, the EPA (2016) found the mapping was too coarse to accurately identify the distribution of feed tree species:

> *The effectiveness of a floristic based habitat mapping approach carries the risk of either missing key habitats or koala occupancy. The accuracy of maps is variable and their development would be costly across the Crown forest estate. Based on the findings of this project, it would be cost prohibitive to undertake a mapping program to identify graded habitat quality classes. Further, a product based solely on plant community types or any other vegetation data layer is too unreliable to protect koala populations, owing to the canopy species variation displayed within vegetation types, and the influence of other factors. In the absence of a guaranteed improvement to the protection of koalas, the use of these methods to develop a graded habitat map for use as a surrogate to identify and protect koala populations is not justified.*

1 (a) 3. Loss of Large Trees

Koalas have been found to have preferences for larger trees, apparently for multiple reasons that remain poorly defined, and that this is a key determinant of habitat suitability. While this has been recognised for a long time, unfortunately for political/financial reasons this is often ignored in habitat assessments and planning processes. This has major ramifications for habitat protection as the failure to account for tree size allows suboptimal trees to be

retained as feed trees and is likely to be a principal reason for the failure of habitat models to reflect Koala's current distribution. It is apparent that significant reductions in larger sized trees will have significant impacts on the availability and quality of Koala habitat. It needs to be recognised that the retention of larger trees is essential for maintaining resident Koala populations. It also has significant ramifications for offsetting as it is often not recognised and accounted for that it takes decades before planted trees provide equivalent resources.

Many studies have identified Koalas preference for larger trees (Hindell and Lee 1987, Lunney *et. al.* 1991, Sullivan *et. al.* 2002, Moore *et. al.* 2004b, Smith 2004, Moore and Foley 2005, EPA 2016). While this has been recognised for a long time it is often ignored as a variable in numerous studies. Tree size has been found to be the most significant variable after tree species in a number of studies, though this seems to be often ignored or downplayed for resource and political reasons.

The relationship between tree trunk diameter and foliage weight is logarithmic (Hindell and Lee 1987). From their 10 year study on Phillip Island Moore and Foley (2005) found that koalas used trees that were on average significantly larger than expected, which they considered "*represent larger food patches and account for a greater proportion of the foliar biomass available to koalas*".

From their study near Melbourne, aside from tree species Hindell and Lee (1987*)* only found a significant correlation with the relative proportion of large trees in each species, stating *"Our data also showed that koalas favoured large trees and forest in which large trees were most abundant, and also showed that large trees occurred where the tree density was lowest. This preference for large trees did not change with season and appeared to be independent of species",* and consider:

> *There was a significant correlation between density of koalas and three of the structural components, the most significant of which was the negative relationship with tree density and small trees (7-19 m high). Thus the blocks with the highest densities of Koalas were those characterised by low tree densities and large trees.*

Size class	***Males***	***Females***	***Non-breeding females***	***Breeding females***	***TOTALS***
0-50	*8.0*	*0.5*	*0.6*	*0.0*	*0.6*
51-100	*2.2*	*0.9*	*1.0*	*0.5*	*1.5*
101-150	*5.2*	*5.5*	*5.8*	*3.8*	*5.5*
151-200	*10.8*	*11.5*	*10.7*	*16.0*	*11.1*
201-250	*17.7*	*17.0*	*17.7*	*13.4*	*16.7*
251-300	*21.2*	*26.3*	*25.2*	*32.1*	*24.1*
301-1100	*41.9*	*38.0*	*34.2*	*39.0*	*40.4*

Table 8(b) from Hindell and Lee (1987): Preference indices of Koalas for each size class of tree (expressed in estimated dry weight of foliage, in kilograms) - by sex and female breeding state.

Hindell and Lee (1987) consider:

> *While the leaves of large trees may have different nutritional properties to the leaves of small trees, it seems more likely that large trees are chosen for some other reason. Large trees have more foliage and consequently may reduce the frequency with which koalas need to move between trees. However, koalas generally move two or three times a night, regardless of the size of the trees they are using (M.Hindell, personal observation). Alternatively, large trees may provide more shelter and greater security from predators. Koalas have few means of escaping adverse weather but sometimes seek out dense foliage such as clumps of mistletoe, and these are most frequent in large trees.*

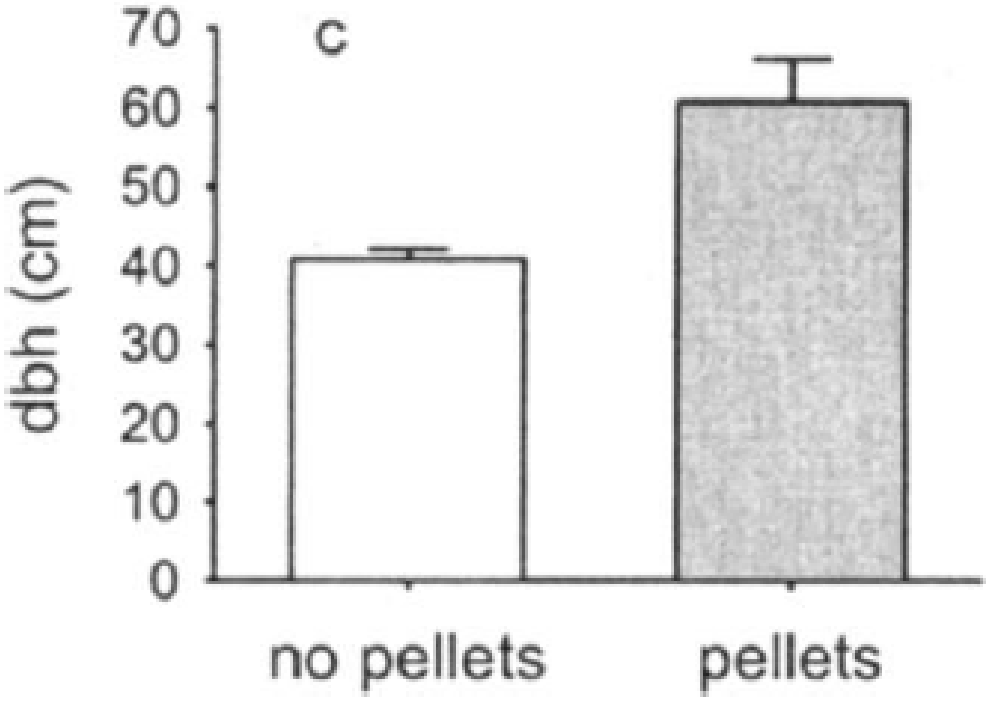
Handasyde and Martin (1991) comment:

> *There is no scientific evidence that Koalas favour disturbed habitat or prefer to feed in eucalypt regrowth forest. The contrary is true. In all of the wild populations we have studied in the past 15 years, the animals have preferred to feed in large mature trees. In our experience koalas rarely feed in saplings or regrowth. When they do, it is usually when mature trees are scarce and the animals are nutritionally stressed.*

In 1999 the Comprehensive Regional Assessment, undertaken jointly between the Commonwealth and NSW Governments in north-east NSW (Environment Australia 1999), expert workshops unanimously identified a significant threat to Koalas as *"Logging that fails to retain stems in the 30-80 DBH size class".*

Sullivan *et. al.* (2002) note "*Our data suggest that about 100 m*^{2} *(Table 4) is a threshold above which tree use by koalas changes in comparison to trees with smaller canopy areas. On average, the length of tree visitation increases with an increase in tree girth, and this might be an attempt to reduce the energetic cost of moving between trees*"

From their study of Tallowwood in north-east NSW, Moore *et. al.* (2004b) found that tree diameter at breast height (dbh) was one of the best explanatory variables for the presence of koala pellets at a site, finding "*koala pellets were more common under larger, less chemically defended trees*" and noting "*It is well known that free-ranging koalas prefer larger trees*".



Extract from Fig. 12 in Moore *et. al.* (2004b) mean dbh for trees with and without koala pellets.

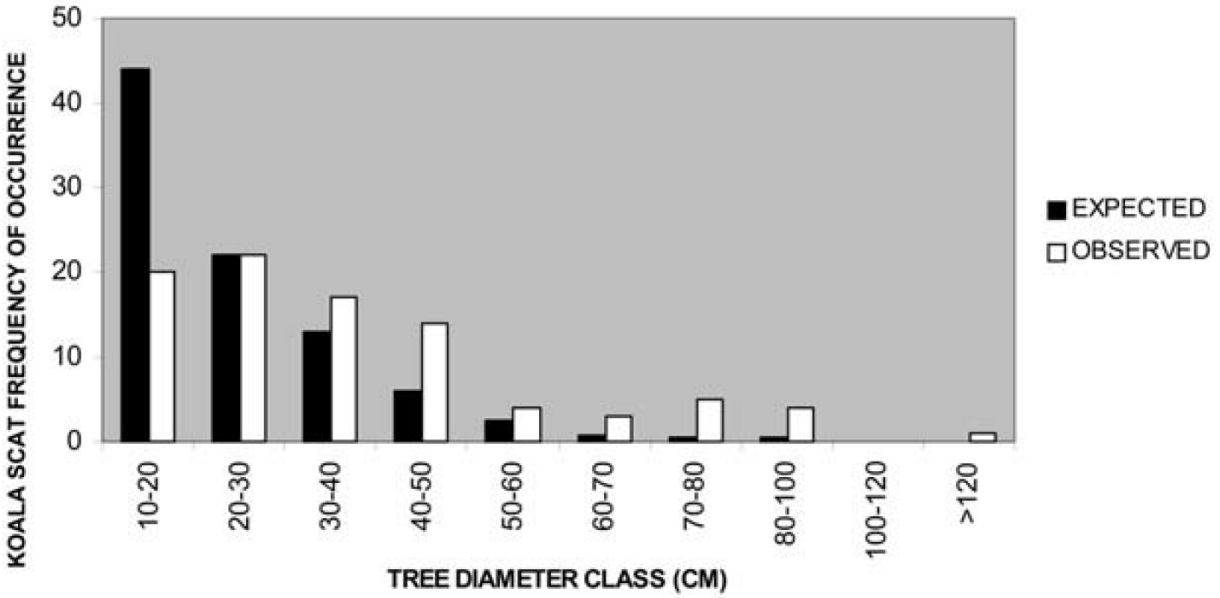


Figure 3.from Smith (2004): Observed frequency of occurrence of koala scats under trees of different sizes compared with expected frequency assuming that trees are selected in direct proportion to numbers present in the forest. It is worth noting that while Smith found no significant relationship with the largest trees because of their low numbers, there is an apparent increasing usage with size.

In his investigations of Koalas in Pine Creek State Forest near Coffs Harbour, Smith (2004) "*identified forest structure to be a key predictor of koala scat density after food tree species and diversity*", noting:

> *Scat abundance differed most significantly (t test p= 0.003) between the structurally uniform regrowth groups (1-3) with a mean of 0.3 trees with scats/site and uneven-aged structurally diverse groups (4-6) with a mean of 1.3 trees with scats/site.,,*
>
> *... The number of trees with scats was significantly correlated with the number of stems in the medium to large size classes (50-60 cm, 60-70 cm and 70-80 cm, Table 2).*
>
> *There were no significant correlations with the number of stems in tree size classes less than 40 cm dbh or greater than 80 cm dbh.*
>
> *Scats occurred more than expected at the base of trees over 30 cm dbh. Significant discrepancies (Chi-square test P< 0.05) were apparent in the 40-50 cm and 10-20 cm dbh classes with the larger stems favoured and the smaller stems avoided. Stems of 60-70, 70-80 and 80-100 were also associated with scats more than expected but these differences could not be statistically validated because of small samples sizes.*
>
> *... There was, however, a highly significant difference between the mean number of trees with scats in non plantation sites (average=1.23 trees per plot) and sites in plantations (average = 0.15 trees per plot*

Smith (2004) conjectured that this preference for larger trees "*may be at least partially related to the energetics of climbing ...koalas can be expected to select individual trees which are either easy to climb or closely spaced within jumping reach. Koalas may also prefer larger trees because they provide larger branches or forks for day and night time sleeping*". He concludes:

> *I suggest that dense uneven-aged forest structure enhances foraging efficiency by providing greater access to eucalypt foliage. Koalas are unable to support themselves on the fine*

outer branches of trees because of their large body mass and they must reach out and pull small, outer branches toward them while seated on a nearby larger branch or trunk. This mode of feeding should be favoured in uneven aged forests with a complex structure and multiple foliage layers between the ground and canopy levels. Plantations with small diameter trunks, fine outer branches and a single exterior foliage canopy layer, and recently logged forests with a low basal area offer the least efficient foraging structure.

In her study of Koalas on St. Bees Island (near Mackay) Ellis (2009) found:

E. tereticornis tree girth was significantly correlated with the number of times that koalas were observed in a tree (r=0.121, n=1,754, p<0.001). ... Eucalyptus used only one time have a significantly smaller girth than those used on more than one occasion (133.5±3.0 vs. 114.6±1.6 cm; t=5.577, p<0.001).

...

Our findings provide some indication that frequency of feeding tree use by koalas is related to tree girth, but a threshold tree size might be responsible for guiding koala foraging patterns.

The NSW Recovery Plan for the Koala (DECCW 2008) identifies that Koalas have been found to have a preference for larger mature trees of specific species, stating:

Smith and Andrews (1997) found that koala activity was greater in structurally diverse forest with the majority of trees 50–80 cm diameter at breast height (dbh). White (1999) found that koalas preferentially utilise trees between 25.5–80 cm dbh, with under-utilisation of trees less than 25.5 cm dbh. Lunney et al. (2000a) found that the koalas in the Coffs Harbour area favoured trees of 50–60 cm dbh and greater than 120 cm dbh".

As part of a project to map Koala habitat, the EPA (2016) assessed the relationship between Koalas and key variables in 4 State Forests in north-east NSW known to have significant Koala populations. The found usage of preferred species increasing linearly with tree size, noting "*the data demonstrates a strong positive relationship between size class and activity, with highest activity in the largest size class*", concluding that for Koalas:

Limited areas of higher koala activity corresponded with; a higher abundance and diversity of local koala feed trees, trees and forest structure of a more mature size class (>30 centimetres and mature forest structure), and areas of least disturbance.

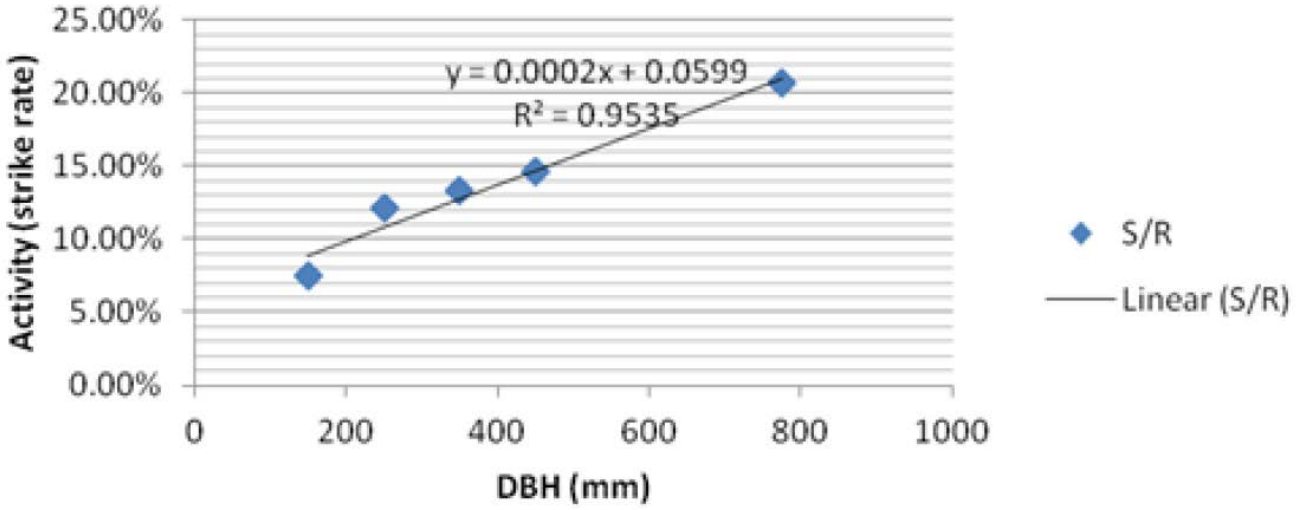


Figure 5 from EPA 2016: Size class of grey box versus scat strike rate

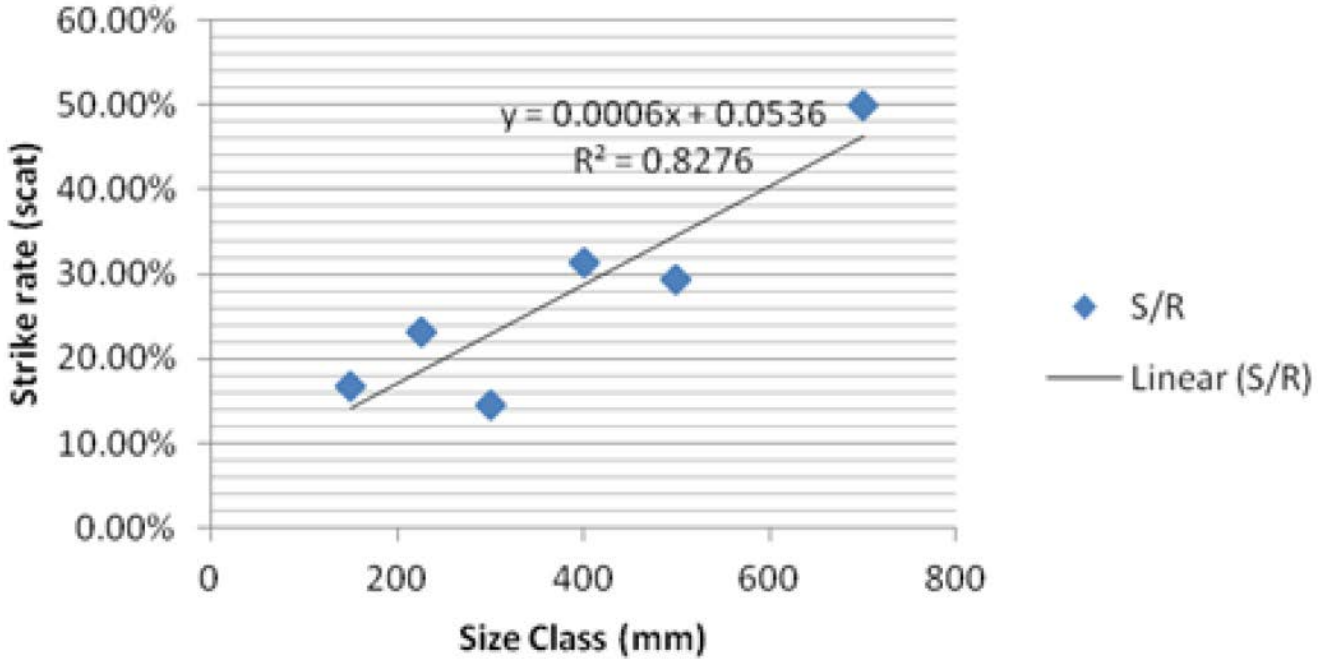


Figure 4 from EPA 2016: Size class of small-fruited grey gum versus scat strike rate

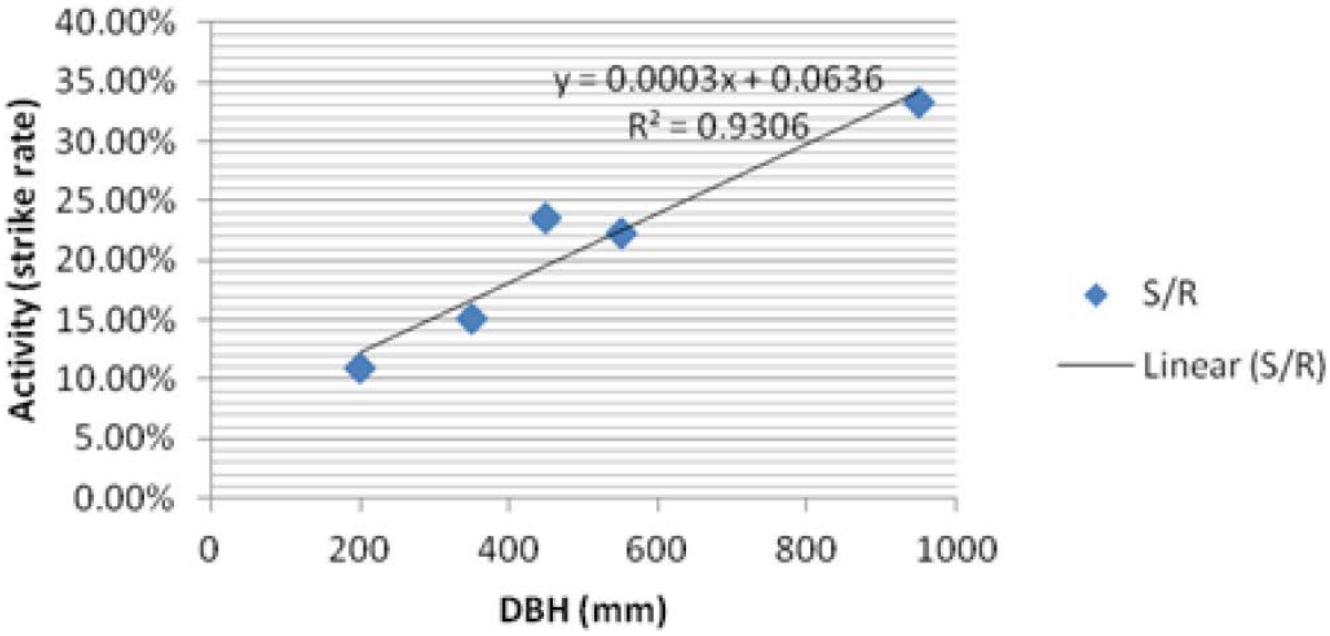


Figure 65 from EPA 2016: Size class of tallowwood versus scat strike rate

The fact that Koalas preferentially select larger trees despite their having increased leaf toxins emphasises that size does matter. Moore and Foley (2005) predicted that trees with high concentrations of the plant secondary metabolite 'formylated phloroglucinol compounds' (FPC) would receive low rates of koala visitation. They found that both Koalas and FPC concentration was positively correlated with tree size, stating "*so by biasing their visits towards larger-than-average trees, koalas were limiting their dietary choices to a subset of trees with higher-than-average FPC concentrations*".

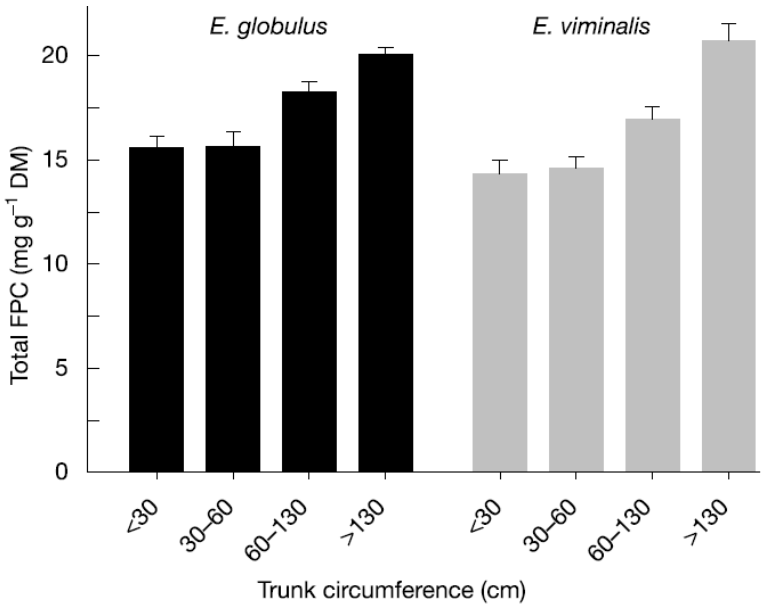


Figure 1 from Moore and Foley (2005): 'formylated phloroglucinol compounds' (FPC) concentrations in four tree size classes. Mean FPC concentrations (with one standard error) in each of four size classes of tree, for E. globulus (black bars) and E. viminalis (grey). DM, dry matter basis.

Briscoe et. al. (2014) found that in hot weather Koalas use tree trunks to cool down, an effect that will be enhanced by tree size, particularly as the effect is related to the extent that the body is in contact with the tree surface, stating "*During hot weather, animals adopted postures with higher surface area exposed ... were more frequently observed with all limbs outstretched and oriented themselves so that they appeared to be hugging the trunks or large lower branches of trees*". They note:

> *During hot weather, koalas enhanced conductive heat loss by seeking out and resting against tree trunks that were substantially cooler than ambient air temperature. Using a biophysical model of heat exchange, we show that this behaviour greatly reduces the amount of heat that must be lost via evaporative cooling, potentially increasing koala survival during extreme heat events. ... Our results highlight the important role of tree trunks as aboveground 'heat sinks', providing cool local microenvironments not only for koalas, but also for all tree-dwelling species.*

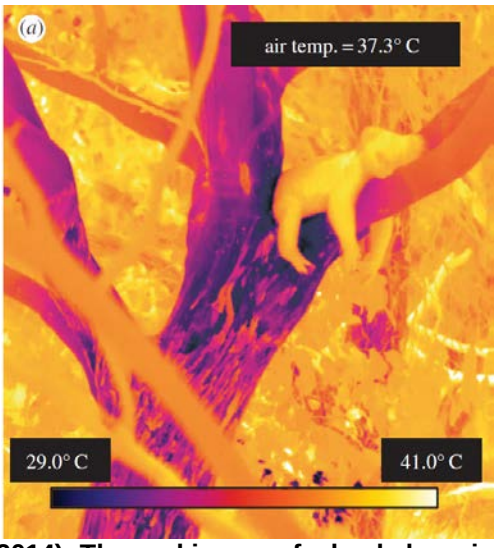


Figure 2(a) from Briscoe et. al. (2014): Thermal image of a koala hugging the cool lower limb of a tree, illustrating a posture typically observed during hot weather

The EPA (2016) also found Koalas had a clear preference for areas with >50% mature and over mature trees in vicinity (p.62) "*Seventy-four per cent (74%) of all activity resides in the high class of structural maturity*". This reinforces Koalas need for larger trees.

Table 30: Koala activity by structure

Row labels	Mature and over mature (>50% of polygon)	Mixed (50:50)	Regeneration (>50% of polygon)	Unassigned	Total
High activity	9	1		1	11
Normal activity	17	5	4	1	27
Low activity	17	2	1		20
Total	43	8	5	2	58
As a percentage	74%	14%	9%		

The EPA (2016) note (p85):

> *The structural component of a forest comprises trees of different size classes, and both size and structural diversity of forests correlates with higher koala occupancy (Lunney et al. 1996; Phillips' 2013; Smith 2004). This study found koala activity correlated with larger tree size classes and mapped mature forest components of the pilot areas. Smith (2004) found forest structure to be a key predictor of koala scat density after food tree species diversity and abundance, where scat abundance was greatest under trees with a diameter at breast height (dbh) of 40–80 centimetres. Phillips' (2013) reports similar preferencing for trees >30 centimetres in low fertility areas.*

1 (a) 4. Logging Impacts on Koalas

By removing the larger Koala feed trees, and nearby trees and large shrubs used for roosting, logging diminishes the availability of resources for Koalas. While Koalas have preferences for larger trees they are not reliant upon tree hollows and so can tolerate a larger degree of habitat degradation than many other arboreal mammals. Never-the-less logging that reduces the availability and size of available feed trees, and associated roost trees, reduces the suitability and carrying capacity of that habitat. It is a furphy to claim reductions in resources will have no, or little, impact on Koalas.

While Koalas can persist in degraded habitats, there can be no doubt that they need to expand their home ranges to obtain equivalent resources and spend more time on the ground moving between feed trees which makes them more vulnerable to predation. When habitat is sufficiently degraded mortality can outstrip recruitment, turning once high quality habitat into sink habitat where Koalas may still be present but the population is in decline. There comes a time when habitat is so diminished that Koala's social system can break down and remaining individuals become stressed and thus more vulnerable to disease.

The drying of regrowth forests due to increased sun access and increased transpiration of regrowth has a direct impact on Koalas, and, along with the density and low canopy of regrowth, makes the forests more vulnerable to the intense fires that are a direct threat to Koalas.

The one survey relied upon by the timber industry to justify the ongoing logging of Koala habitat was undertaken by the forestry unit of the Department of Primary Industries, who are not independent and whose data do not justify their subjective conclusions.

There are far more robust studies that shows that Koalas are declining on State Forests and that this will be exasperated by the increased logging intensity, reduced retention of mature trees and reduced exclusions allowed by the new logging rules.

The DPI-Forestry survey used acoustic recorders to record male Koala calls for a week during the breeding season at 171 sites in modelled medium-high quality Koala habitat throughout northern NSW, recording one or more calls at 106 sites.

The biggest failing of the DPI-Forestry assessment is that it is based on extrapolation from just the calls of male Koalas somewhere within 300m (or up to 2km - Jurkis and Potter 1997) of the recorder, with no indication of whether other Koalas were present or whether it was just a transient male searching for a mate.

Forestry's current rules for identifying a high use Koala tree is that it has to have more than 20 Koala scats (faecal pellet) under it, and a Koala High Use Area has to have an additional 3 out of 10 trees searched with scats under them.

The only ground-truthing reported (Law et.al. 2017) for Koala occupancy in the DPI-Forestry study were searches of 40 trees at each of 65 sites for Koala scats, with no scats found at 54 sites and just 1-2 scats found at 11 sites.

Koalas were recorded calling at 19 of the 65 ground-truthed sites, with no scats found at 16 sites and only single scats found at 3 sites. This indicates either a very low usage by Koalas or that the calling Koalas were outside the sampled area.

Half the sites recorded only1-3 calls over 7 nights in the breeding season, which does not indicate the presence of a breeding colony anywhere nearby.

It is particularly significant that any Koalas calling could have been hundreds of metres away or transient. Given that measurements of habitat variables were made within 50m of the recorders it means the variables measured (i.e. tree species, tree cover, stand structure, logging intensity) and used in analyses are not necessarily indicative of where Koalas live.

Both DPI-Forestry and the industry conveniently ignore other more robust research that has found Koalas prefer the larger trees targeted by loggers and that their populations are declining on State Forests.

An EPA (2016) study found that higher Koala activity was positively correlated with trees and forest structure of a more mature size class, and areas of least disturbance, concluding that once high quality Koala habitat in Clouds Creek and Maria River State Forests had been degraded and now have declining Koala populations:

> *Areas of higher activity positively correlated with greater abundance and diversity of local koala feed trees, trees and forest structure of a more mature size class, and areas of least disturbance.*
>
> *...*
>
> *The structural component of a forest comprises trees of different size classes, and both size and structural diversity of forests correlates with higher koala occupancy (Lunney et al. 1996; Phillips' 2013; Smith 2004). This study found koala activity correlated with larger tree size classes and mapped mature forest components of the pilot areas. Smith (2004) found forest structure to be a key predictor of koala scat density after food tree species diversity and abundance, where scat abundance was greatest under trees with a diameter at breast*

height (dbh) of 40–80 centimetres. Phillips' (2013) reports similar preferencing for trees >30 centimetres in low fertility areas.

A 2004 study by Dr. Andrew Smith (Smith 2004) of Pine Creek State Forest found that Koalas preferred structurally complex, uneven-aged forests with some mature and oldgrowth elements and a large basal area, concluding that modern high intensity harvesting practices that remove a high proportion of stand basal area and leave only small diameter stems (<50 cm diameter) are incompatible with koala conservation:

> *Koalas preferred structurally complex, uneven-aged forests with some mature and oldgrowth elements, a large basal area, and mixed species associations dominated by tallowwood, grey gum and forest oak. Koalas were least abundant in plantations and structurally uniform, blackbutt dominated regrowth native forests with a low tree species diversity. Trees of 40-80 cm dbh and stands with more than three koala food tree species per survey plot (50 by 50 m) were preferred. Historical timber harvesting practices involving low intensity harvesting of large diameter stems were successful in maintaining koala populations. Modern, high intensity harvesting practices including extensive gap clearfelling and Australian group selection that remove a high proportion of stand basal area and leave only small diameter stems (<50 cm dbh) are incompatible with koala conservation.*

A Biolink (2013) study for Port Macquarie-Hastings Council found that State Forests had less than half the number of active Koala sites than nearby National Parks and concluded that logging had decimated the once substantive local Koala populations, commenting:

> *... koala activity was recorded less commonly from areas of State Forest where field data and other knowledge strongly points to cumulative impacts of logging over time resulting in significantly lower size classes of preferred food tree species which in turn results in a lower koala carrying capacity.*
>
> *...*
>
> *It is significant that koala activity was least commonly recorded from State Forests generally; these being areas wherein both the historical record and local knowledge can attest to the presence of once substantive local populations. However, data arising from this survey supports an assertion that the long-term logging of tree species preferred by koalas is having an effect on koala carrying capacity in these forests, ...*

Whatever its shortcomings, the DPI-Forestry survey (Law et. al. 2018) is based on past logging regimes where they attribute the persistence of Koalas near their sites to half the surrounding area being excluded from logging, including in riparian buffers, old growth and rainforest exclusion areas and Koala High Use Areas, as well as the retention of mature trees, habitat trees, recruitment trees and feed trees for other species in logged areas:

> *Resilience of koalas to recent, heavy harvesting is most likely explained by the landscape mosaic of forest types and disturbance history in north-east NSW; especially the level of harvest exclusion in the landscape. Over the last 20 years exclusions averaged ~ 40% of the State forest area in the region [7]. In our study, about 50% of the 1 km area surrounding our recent, heavy harvest sites received this treatment in the last 10 years. The remainder comprised temporary off-set zones, but also permanent riparian buffers, old growth and rainforest exclusion areas and habitat protection for owls. In addition, large trees (40–80 cm dbh) provide important shelter and browse for koalas [31, 32]. Within the harvest area, scattered habitat trees, recruit/seed trees and feed trees for other species assist in providing a scattered uneven age structure, even where harvesting is heavy [7].*
>
> *...*

> *Koala high-use areas supported nearly three times the bellow rate (3.1 bellows night^{-1}) as other treatments*

The NSW Government's new logging rules have doubled logging intensity, zoned 140,000 ha of coastal forests for clearfelling, removed the need to retain mature trees (including recruitment and most eucalypt feed trees), reduced the buffers on headwater streams and is intending to open up protected oldgrowth forest for logging. This will significantly increase impacts on Koalas.

Specifically for Koalas they are removing the need to look before they log and protect Koala High Use Areas, despite DPI-Forestry finding that Koala High Use Areas have 3 times the Koala call rate of recently logged forests.

It is ironic that DPI-Forestry (Law et. al. 2018) refer to a Forestry Corporation radio-tracking study (Jurkis and Potter 1997) in the early 1990s near Eden NSW to justify their claim that koala home ranges can comprise a mosaic of regrowth and unlogged habitat, as that population was extinct a few years later. Stalenberg, et. al. (2014) identify:

> *... Jurskis and Potter (1997) on the basis of their koala radio-tracking study in Tantawangalo State Forest ... concluded that young regrowth trees are used by koalas and that the regrowth forest after logging is likely to increase rather than decrease koala populations. That conclusion proved to be both premature and ill-judged. Our study, including the detailed field surveys by Chris Allen, has shown that the population of koalas in Tantawangalo has since disappeared. It was necessary to follow this population for a much longer time to confirm their optimistic prediction or establish what other factors were playing out.*

Now history is repeating itself as the Forestry Corporation use dodgy science to deny impacts while introducing an Eden-style alternate coupe clearfelling regime into 140,000 ha of what they identify as the best Koala habitat on the north coast.

Intense fire is a recognised significant threat to Koalas. Logging induced changes to microclimate, stand structure and species composition, coupled with logging debris, increased leaf-litter accumulation and eucalypt regrowth has been found to make wet forests significantly more vulnerable to burning (i.e. Jackson 1968, Roberts 1991, Lindenmayer et.al. 2009). Lindenmayer et.al. (2009) cite studies that found rainforest logging reduced the number of dry days needed to make a forest combustible and increased the flammability of tropical rainforest by 14–50%. From their review, Lindenmayer et.al. (2009) conclude that industrial logging is likely to make rainforest and wet forests "*more, not less, prone to an increased probability of ignition*". Lindenmayer et.al. (2009) also note that:

> *Large quantities of logging slash created by harvesting operations can sustain fires for longer than fuels in unlogged forest and also harbor fires when conditions are not suitable to facilitate flaming combustion or the spread of fire (Cochrane & Schulze 1999).*

1 (b) (i) the impacts on koalas and koala habitat from the Coastal Integrated Forestry Operations Approvals and Regional Forest Agreements

The Forestry Corporation's basic management response to Koalas used to be that if you see a Koala in a tree, wait for it to move before logging its tree. Over the 25 years since threatened species legislation was implemented to protect the Koala from logging operations there has been no meaningful change, except that Koala populations on State Forests have dramatically declined in many areas while the EPA turn a blind eye.

It took until 1997 for the first logging prescription for Koalas to be implemented across logging operations, and it was written by the Forestry Corporation. The basic intent was to undertake pre-logging surveys for Koala scats (faecal pellets), when at least two 2 out of 10 consecutive trees searched had scats, or a single tree had either a Koala or more than 20 scats, they were identified as high use areas and a 50m exclusion area was applied. Where scats were found but the threshold not reached the compartment was identified as intermediate habitat and 10 Koala feed trees per hectare had to be retained.

Protection for Koalas was significantly reduced with the adoption of the 1999 Threatened Species Licence, which increased the threshold to identify a Koala High Use Area to require a trigger tree (ie sighting, >20 scats, mother and baby) and 3 out of 10 trees consecutively searched to have scats, and reduced the exclusion area from 50m to 20m. Similarly feed tree retention in intermediate habitat was reduced from 10 to 5 per hectare. The need to monitor the effectiveness of the prescription was also removed.

When in 2012 NEFA caught the Forestry Corporation logging Koala High Use Areas Royal Camp State Forest we exposed that for 15 years the Forestry Corporation had not been undertaking the required thorough searches for Koala scats necessary to identify Koala High Use Areas. For a few months after this the EPA belatedly attempted to enforce the Koala prescription by auditing Koala surveys, though at the behest of the Forestry Corporation they quickly desisted and supported the Forestry Corporation's proposal to remove the need for Koala scat surveys and the protection of Koala High Use Areas. NEFA have consistently found in our audits that since then the Forestry Corporation are routinely failing to thoroughly search for Koala scats elsewhere, and despite our efforts the EPA refuse to make them.

A NEFA analysis of State Forests Biodata (from Wildlife Atlas) over the years 1997-2016, limited to high quality and very high quality habitat as mapped by DPI, revealed an average of 9.6 Koala observations, the hearing of an average of 3.6 calls and finding of 74.6 trees with Koala scats under them each year, despite requirements for extensive surveys. This is an extremely low strike rate for what is meant to be some of the best habitat left for Koalas in New South Wales. It is no wonder that in 2018 the Government identified that only 200 hectares of Koala High Use Areas had been identified in the previous 15 years.

To make matters worse in 2006 the Forestry Corporation began practicing an unlawful perversion of the logging regime Single Tree Selection (STS). Rather than limiting basal area removal to 40%, and retaining all trees <20 cm dbh, as legally required by STS, they adopted 'medium', 'heavy' and

'regeneration' STS which allowed up to 85% of the basal area to be removed. This is effectively clearfelling. These perversions were extensively applied to some of the best modelled Koala habitat in coastal forests. NEFA found that from 2006-17 in the Lower North East region. the Forestry Corporation had subjected 74,906 ha to the unlawful logging practices of 'medium', 'heavy' and 'regeneration' STS, which comprised of 23,742 ha (32%) of modelled high quality Koala habitat and 717 Koala records. Despite the EPA's token objections this continued unabated, though was limited by the collapse of the export woodchip market in 2013.

In 2017 the Office of Environment and Heritage (OEH) analysed Koala records *"to delineate highly significant local scale areas of koala occupancy currently known for protection",* which they term Koala Hubs. A NEFA review of gross logging disturbances from satellite images identified that the Forestry Corporation logged 2,546 ha of Koala Hubs from 2015-2018, with some 430 ha of Koala hubs logged since they were identified. This means that over the past 4 years 21% of the loggable area of Koala Hubs within native forests on State Forests have been logged. The harvesting plans available online show that extensive areas of Koala Hubs are proposed for logging this year.

For the new Coastal IFOA, rather than requiring independent surveys the EPA was obsessed with removing the requirement for pre-logging surveys for Koalas and the need to identify and protect Koala High Use Areas and replacing it with tree retention prescriptions applied to various classes of modelled habitat.. In 2016 the EPA undertook a project overseen by an independent expert Koala panel to review various approaches to map potential Koala habitat, with extensive groundwork to test the mapping. The project found that neither modelling nor ecosystem mapping were accurate enough to identify the "*occurrence of feed trees and therefore habitat class at the level of detail required for management in state forests*", with the panel unanimously agreeing that "*the primary intent and focus should be to identify the location, distribution and extent of areas that are supporting extant/resident koala populations*".

Despite the conclusion from their study that modelling is too inaccurate for regulation at the scale of individual logging operations, the EPA funded DPI Forestry to complete their model, despite its being considered as inadequate by the expert Koala panel.

Under the new Coastal IFO two Koala models are used to set tree retention rates. Based on the advice of the Government Fauna panel, the EPA proposed a retention rate of 25 trees per hectare >25 cm dbh within High/high quality habitat, 20 trees per hectare in High/moderate quality habitat, and 15 trees per hectare in Moderate/moderate quality habitat. On the basis of resource impacts this was reduced 10 trees per hectare >20cm dbh in High/high quality habitat and 5 trees per hectare within compartments with more than 25% High/moderate or moderate/moderate habitat.

The OEH (2018) complained that the new Koala feed tree retention rates are less than half the number and of a smaller size than proposed by the Expert Fauna Panel, concluding that the increased logging intensity proposed under the new rules is expected to impact Koalas through diminished feed and shelter tree resources.

There can be no doubt that the loss of protection for Koala High Use Areas and the intended token retention of feed trees in virtual Koala habitat will greatly compound impacts on Koalas. This is obviously the intended outcome.

Over the past 20 years there has been no monitoring of the effectiveness of the various Koala prescriptions, and there were no trials of the new prescriptions. The only result available is from the

DPI-forestry acoustic survey that found Koala high-use areas supported nearly three times the bellow rate as other treatments.

The Forestry Corporation has a long history of avoiding its legal obligations to identify and protect Koala High Use Areas. The new prescription removes this need while only retaining token feed trees in modelled habitat. It is self-evident that if the NSW Government has a genuine intention to stop and reverse the ongoing decline of Koalas on public lands it needs to initiate a moratorium on any further clearing or logging of potential Koala habitat on public land while:

5. **undertaking rapid systematic surveys for Koalas with independent experts on a metapopulation basis to identify extant Koala populations, delineate core Koala habitat, and better define regional food preferences.**
6. **ensuring core Koala habitat is identified and protected by either transfer to National Parks or inclusion in Forest Management Zone 2.**
7. **ensuring potential Koala habitat and corridors are identified and subject to retention and restoration of adequate food trees.**
8. **only allowing site specific proposals for logging of potential Koala habitat to occur where they have been subject to surveys by independent and competent professionals applying, at least in part, repeatable methodologies, and reviews by independent Koala experts.**

1 (b) (i) 1. Pre-RFA Logging

In 1989 the Forestry Commission undertook a survey of their district foresters to find out what, if anything, they bothered to do for Koalas encountered during logging. Their responses displayed a general ignorance about Koalas and whether they were present within logging areas, most stated they had had no standard procedures, commonly responding along the lines of "*About the only thing done in a logging operation when a koala is located is to not fall the tree, at that time. It may be felled later (next day) if the koala has moved*" (Ernie Chiswell, Coffs Harbour District Forester, 29.11.1989)

This all changed when the Forestry Commission were taken to court by NEFA in 1991 over their right to take or kill threatened species, including Koalas, without a licence in Chaelundi State Forest (Corkill vs Forestry Commission 1991). The Forestry Commission's internal admission's of doing nothing for Koalas were a significant component of the evidence presented to court, leading The Australian (24 August 1991) to report in an article titled "*Koalas 'endangered' by Chaelundi logging*":

> *Koala populations are "collapsing" in NSW, according to statements in an extraordinary series of internal reports by Forestry Commission officers, tendered under subpoena to the State's Land and Environment Court yesterday.*
>
> *...*
>
> *The Koala comments of these and other commission officers dominated yesterday's hearing of an application seeking to restrain permanently the commission from logging in the Chaelundi State Forest in north-east NSW.*
>
> *...*
>
> *Mr Robertson was seeking to prove that logging would breach provisions of the National Parks and Wildlife Act, which make it a criminal offence to take or kill protected or endangered wildlife, including koalas.*

The court case established that the Forestry Commission were required by the National Parks and Wildlife Act 1974 to obtain licences from the NPWS to take or kill endangered species, with this requirement extending back to the 1918 Birds and Animals Protection Act 1918, and continued in the Fauna Protection Act 1948. As early as 1918 'take' was defined to include "'disturb or injure". In relation to Koalas, Justice Stein (1991) concluded from the evidence that:

> *I find that the koala is very likely to be disturbed, or injured by the proposed forestry operations. The species is clearly sensitive and has limited food tree sources. The koala will likely be detrimentally affected by permanent changes in the forest structure. Its numbers will diminish as its habitat is disturbed.*

Justice Stein (1991) identified the Koala as one of the *"endangered species listed in Schedule 12 of the National Parks and Wildlife Act 1974"* that the proposed logging and roading was likely to "*disturb or injure*".

The subsequent passage of the Endangered Fauna (Interim Protection) Act 1991 forced both the NPWS and Forestry Corporation to begin developing licence requirements. The Forestry Commission were issued "temporary licences" which were extended year after year, without preparing the required Fauna Impact Statements. At least, theoretically, they could no longer simply ignore the plight of Koalas

The NPWS Management Plan for the Coffs Harbour Koala Population (Lunney *et. al.* 1992) suggested guidelines for the management of koalas in the State Forests of the Coffs Harbour Region, including:

> ...
> *v) Development of a system of reserves for koalas by dedication and/or through the Preferred Management Priority (P.M.P.) system, including both core habitat and adequate corridors;*
> *vi) Adoption of the following procedures and protocol for dealing with koalas in areas being considered for logging:*
>
> > *...*
> > *e) use the following prescriptions during operations:*
> > ** familiarise workers with signs of koala presence.*
> > ** if a koala or new evidence is found during logging:*
> >
> > - *stop work*
> > - *mark and identify tree. Leave 200m around tree(s)*
> > - *notify District Forester and NPWS*
> > - *arrange inspection by independent expert*
> > - *if evidence of regular use found, use asterisk technique to determine extent of use.*
> > - *alternative logging area to be used until survey complete*
> > - *if more than two koalas found within 200m radius, reserve area until next logging cycle. A minimum of 5ha per koala of suitable habitat to be reserved*
> > - *logging in regularly used areas to be limited to:*
> >   - *25% of stems*
> >   - *non-preferred koala food species*
> >   - *any trees used by koalas to remain*
> >   - *trees larger than 1m DBH may go if unused*

- *if no regular use determined, resume operations avoiding the koala and trees within 20m*
- *submit full report to NPWS*

f) In all instances where logging is carried out in areas where koala evidence is known but a survey has not found koalas on site, a minimum of 10 koala food trees/hectare, over and above other habitat tree retention requirements, should be retained on site ...

In 1993 the Forestry Corporation identified "Koala Survey Techniques for Intensive Logging Operations" (James Shields 23 July 1993) which involved undertaking pre-logging transect searches (2 100x20m per 20ha) for Koalas, with 2 quadrat searches (5x5m) for Koala scats on each transect, and 4 hours spotlightling and Koala call playback.

In 1995 the renamed State Forests proposed their own "*Management Prescriptions for Logging in Coastal Forest Types: Koala (Phascolarctos cinereus)*". The pre-logging survey requirements were a 1km walk transect for each 100ha, searching 10 trees per 100m for scats - targeting "*primary and secondary browse species larger than 25cm dbhob with an average of more than 50cm dbhob*" for one minute scat searches within 2m of their bases. When any 2 out of 10 consecutive trees searched are found to have scats it is to be designated a "frequent use area", which is then subject to another 4 transects to delineate the boundary of the high use area and "*logging will be excluded from within fifty metres of frequent use areas according to Harvesting Plans*". In addition "*isolated individual trees with more than twenty Koala dung pellets beneath shall be retained and all logging debris removed at least 10 metres from their base*". If during logging a Koala is observed or a tree with 20 scats beneath it found, then the 10 closest trees need to be searched and if 3 or more (including the original tree) are found to have scats it is identified as "*frequent use area" and "all tree felling will immediately and subsequently be excluded from within fifty metres of areas frequently used by Koalas*".

Significantly these exclusions were apparently intended to be permanent, as the Koala prescription included the "management implications":

Loss of available resources in areas found to be frequently used by Koalas and hence reserved from logging. Consequently there will be a reduction in expected resource availability and a necessary reduction in timber yield off the Management Area.

This was presumably the basis for State Forests' negotiations with NPWS over the interim Threatened Species Licence conditions issued as an outcome of the Interim Assessment Process in 1997. After 6 years of operating under temporary licences finally the NPWS issued the required licences, though without Fauna Impact Statements having been prepared. Basically State Forests' proposed conditions were adopted by the NPWS as a licence condition with little change (see TSL *Prescription 25a. Koala Prescription for North Coast Forest Types* pp. 135-139), except removal of the intent to protect Koala High Use Areas in perpetuity.

1 (b) (i) 2. The 1999 IFOA

When the Koala prescription was transferred into the IFOA Threatened Species Licence in 1999 there were significant changes. The need to undertake pre-logging surveys to identify high use areas was removed and replaced with surveys at the time of logging, the need to search for scats within 2m of a tree was reduced to 1m, the recognition of any area where any 2 out of 10 consecutive trees searched had scats was identified as a high use area was changed to require a

trigger tree (ie sighting, >20 scats, mother and baby) and 3 out of 10 trees consecutively searched with scats, the need to exclude logging from within 50m of high use areas was reduced to 20m, the need to protect individual trees with >20 scats was removed, and the need to protect ten primary browse trees (or secondary browse species if primary are unavailable) per hectare in intermediate use areas was reduced to 5 per hectare. It is important to recognise that the new prescriptions were negotiated prior to reserve outcomes being identified, so no account of reservation adequacy was involved,

The 1999 Threatened Species Licence 5.2.2 requires that in compartments which contain preferred forest types, marking-up must be conducted as part of mark-up surveys at least 300 metres in advance of harvesting operations, with primary browse trees inspected at ten metre intervals with **thorough** searches around the base of trees for Koala scats (faecal pellets).

The identification of an "intermediate use area" for Koalas is, in part, defined as *"a single compartment where Koala scats have been detected under two of any ten consecutive trees searched within that single compartment"*. the Threatened Species Licence 6.14 (c)(ii) requires In intermediate use areas 10 primary browse trees must retained per 2 hectares where available. These trees must marked for retention.

The identification of a "Koala high use area" effectively requires the trigger of finding a high use Koala tree with >20 scats and then the locating of three consecutive trees with Koala scats on at least one of the 100m transects radiating out from the high use tree:

> *"Koala high use area" means an area where any of the following features are located:*
>
> *i. Three out of any ten consecutive trees inspected are found to have Koala scats beneath them; OR*
>
> *ii. a sighting of Koala; OR*
>
> *iii. a tree with more than 20 Koala scats beneath; OR*
>
> *iv. any trees with Koala scats of two distinctly different sizes beneath;*
>
> ***AND***
>
> *i. where the subsequent star search locates at least an additional three out of any ten consecutive trees inspected as having Koala scats beneath them.*

The Threatened Species Licence (5.2.2(c)) required that Forests NSW must conduct "star searches" for a 100 metre radius around high use trees to delineate Koala High Use Areas. Star searches involve thoroughly searching for Koala scats along eight transects radiating out from a Koala high use tree (i.e. >20 scats) for at least 100m.

A Koala High Area is only considered to occur where Koala scats are found under at least 3 trees on a transect, and is then applied for 20m around the initial detection site and those 3 trees. In practice this means that where they are identified they are usually very small areas. The Threatened Species Licence 6.14 (c)(i) states *"Specified forestry activities are prohibited from within all Koala high use areas. A 20 metres wide exclusion zone must be implemented around the boundary of Koala high use areas".*

Since the first Threatened Species Licence was introduced in 1997 there has been a ongoing refusal on behalf of the Forestry Corporation to thoroughly search for Koala scats. This went on for 15 years while the EPA (and their predecessors turned a blind eye) until NEFA exposed the failure to search for Koala scats and the logging of Koala High Use areas at Royal Camp State Forest in 2012.

In 2012 when the Forestry Corporation were two-thirds through logging 3 compartments in Royal Camp State Forest, a limited survey by NEFA identified a Koala High Use Area (HUA) actively being logged, with four others proposed for logging (see 2.1.2. Forestry Case Study 2: Royal Camp State Forest). We forced the logging to stop with both the EPA and Forestry Corporation confirming the Koala HUAs we had identified and the EPA identifying that 61 trees had been logged and 405m of snig tracks constructed within the Koala HUA. Logging resumed nearby a few days later and NEFA again identified that a Koala HUA had been logged, the EPA confirmed that 7 trees were logged and 230m of snig tracks constructed within this Koala HUA. Logging continued and NEFA again identified a Koala HUA was logged - the EPA failed to investigate. When the Forestry Corporation proposed to start logging another part of the forest where they said there were "nil" Koalas, a brief survey by NEFA identified 2 Koala HUAs in the proposed logging area, finding more on later occasions. Numerous other breaches were reported to the EPA, most of which they refused to investigate. The EPA issued the Forestry Corporation with 3 fines, totalling $900 for just the first Koala HUA.

It is evident that Royal Camp and Carwong State Forests support a breeding population of Koalas with abundant scats clearly showing their presence. The failure of the Forestry Corporation in 2012 to find any Koala scats and identify any Koala High Use Areas in Compartment 15 of Royal Camp SF, despite claiming to have undertaken the legally required searches, clearly demonstrates their ongoing intentional failure to identify and protect Koalas on State forests. That logging of Koala High Use Areas continued in compartment 16 after NEFA had exposed the problem, and while the EPA were auditing compartment 15, is testimony to the Forestry Corporation's contempt for their legal obligations to protect Koalas. The Forestry Corporation's lack of remorse or contrition, and a refusal to improve their practices, exemplifies a total disregard for Koala conservation.

For a brief period after Royal Camp the EPA attempted to make the Forestry Corporation undertake thorough scat searches, though quickly succumbed to Forestry Corporation pressure and abandoned any meaningful attempts to enforce compliance.

As a result of our Royal Camp complaints Koalas were made a compliance priority by the EPA. The EPA (2014b) told the General Purpose Standing Committee No. 5 'Inquiry into the performance of the NSW Environment Protection Authority':

> *What else is being done to protect koala habitat on public land?*
>
> *The EPA released the Crown Forestry Compliance Strategy on 1 July 2013. The strategy provides a comprehensive and transparent framework for the regulation of native forestry on public land, including the setting of annual Crown forestry compliance priorities by the EPA. These priorities are based on available data and intelligence, recent compliance findings and a recognition of issues important to the community. The identification and protection of koala habitat is a key compliance priority.*

Koalas were identified as one of the EPA's Cross-tenure environmental compliance priorities for 2014–15 and 2015-16. For "*Protecting koalas and their habitat*" the action proposed was "*Assess compliance with Integrated Forestry Operations Approval (IFOA) and PNF Code requirements relating to protecting koalas and their habitat*", with the purpose being "*Assess compliance and raise awareness of regulatory requirements around Koala protection*", and the output *"Publish compliance summary on EPA website".*

As a consequence of Royal Camp the EPA began to audit Koala scat searches in the Lower North East, identifying that the Forestry Corporation had not undertaken thorough searches for Koala scats ahead of logging in Wang Waulk State Forest (from an assessment of just 12 trees) and Bulahdelah State Forest (from an assessment of just 9 trees). The response to the EPA's draft findings the Forestry Corporation (2013) admitted inadequate mark-up but refused to accept the need to thoroughly search for Koala scats, responding:

> *FCNSW cannot accept the detail and method associated with the specific allegations relating to ... retained koala feed trees. The link the EPA has made between tree marking and searching is not contained in the licence. The EPA's approach to searching for koala scats is not specified in the licence. The very nature of both the koala mark-up technique and star-search technique is subjective and inevitably different results may be expected on a particular day of searching, let alone results from surveys on different days, weeks or months.*

The EPA October-November 2012 final audit report of Wang Wauk State Forest Compartment 116 found that Koala scats were still not being adequately searched for, despite the presence of a Koala High Use Area. They found a tree had been logged within a marked Koala High Use Area, noting *"Given the fact that high use koala activity has been discovered within the compartment it is significant importance that compartment mark up surveys are undertaken in compliance with the licence requirements to facilitate environmental features being located and accordingly protected. For example further koala high use areas"*, finding:

> *The brief assessment undertaken by the EPA including 12 trees only. All 12 trees had evidence to suggest that a 'thorough' search, as per the licence requirement had not taken place. EPA officer observations note that all 12 trees had not had their base disturbed at all, i.e. no leaf litter displaced. Please note that the majority of the EPA assessment was undertaken at the most recently active (currently active) log dump area, which would have been indicative of the likely-hood of SFO searches.*
>
> *Of the 12 trees searched, 5 trees were marked as K or R (or both) trees for retention. Of the 5 marked trees, 8 and 35 koala scats were located at the base of these trees, indicating that the SFO/FNSW personnel had been to the tree, yet hadn't disturbed the surface of leaf or grassy understorey. One search of a marked "K" tree yielded 35 koala scats in a very short space of time, which is a trigger for a koala star search. EPA officer observations noted that age of these koala scats and the likelihood of these scats being deposited prior to or shortly before the commencement of operations in these areas.*

The EPAs response was simply to require an action plan:

> *FNSW must ensure that immediate short term actions are taken to ensure that upcoming koala searches are done in a thorough manner. An long term action plan must be developed and implemented immediately to ensure that all future koala searches are done in a thorough manner for proper identification and appropriate protection of koala high use areas.*

The EPA and Forestry Corporation met in January 2013 to discuss the failure to thoroughly search for Koala scats at Royal Camp, Wang Wauk and Bulahdelah State Forests, the Forestry Corporation (2013b) later submitting:

> *The intermediate use condition is designed to ensure suitable habitat elements (browse trees of preferred species) are retained during harvesting operations to mitigate both the immediate and longer-term impact of harvesting operations.*

The high-use condition is intended to protect individual koalas and their current feed trees from the immediate impact of harvesting operations.

...

The mark-up survey approach was developed from the ... sampling method required in previous licences of 1km/100 ha Koala scat search transects, which included specific requirements for searching based on tree size, quality and a 1 minute minimum search thresholds undertaken during pre-harvest surveys, for two reasons:

Firstly, it was noted that as many, or more, star-searches were triggered during general mark-up survey as from the pre-harvest surveys and, secondly, by the time harvesting commenced, the location or boundaries of the high-use areas were often quite different to those established at the pre-harvest survey stage.

...

The survey methods for both mark-up surveys and star-searches are loose and not well suited to a targeted audit/enforcement approach, nor to a variable approach where search effort is scaled up in those areas with a greater likelihood of koalas being present. Different, experienced and qualified searchers can legitimately choose different trees to search under and/or different parts of the base and crown of a tree to search under and therefore will produce different results. Searches undertaken at different times under the same tree can also produce different results. Under dry conditions and/or in dry locations, scats can last for months; in wet conditions they can last days. Different understorey conditions and growth habits of different tree species/individual trees can markedly influence detectability of koala scats.

Medium term - In order to deliver an improved outcome for Koalas, at reduced cost and that is auditable and enforceable, FCNSW proposes the licence should move to a landscape approach for koalas. A new landscape prescription could better specify primary browse tree retention requirements based on current information, apply them to all compartments where primary browse species occur, rather than to just those compartments with records, and maintain a proportion of potential habitat unharvested area in each compartment. FCNSW will work towards developing and drafting a landscape prescription suitable for discussion with the EPA over the coming weeks.

In 2013 the Forestry Corporation (2013b) identified the problem with having no size limit for the retention of trees in "intermediate use" areas and proposed a "short-term" interim change to the TSL which was never implemented:

... a preference for mixed species forests with a high proportion of preferred browse trees, and trees between 30-80 cm dbh. Tree size preference has been linked to climbing efficiency, tree vigour/nutritional value or even lack of competition with Greater Gliders in areas with few large, old trees.

...

The intermediate-use condition, which FCNSW considers could be the most relevant and practical protection measure, has a flawed definition of 'primary browse trees', with no minimum tree size limit, quality requirements or protection requirements.

...

***Short-term** – in compartments in which the intermediate use prescription is triggered, FCNSW will apply a higher standard to identification and management of primary browse trees. That is, FCNSW will add to the end of the intermediate use prescription ' primary browse trees should have as many of the following characteristics as possible; >30 cm dbh,*

mature and have a healthy crown. Retained primary browse trees must be protected from damage to the greatest extent practicable. When locating and marking these trees, the thorough search for evidence of koala scats must include disturbance of the grass and/or leaf-litter layer, where visibility for the detection of koala scats is compromised.

While the EPA failed to implement the short term measure suggested by the Forestry Corporation (for no apparent reason) they quickly became strong advocates for the Forestry Corporation's landscape approach for koalas.

After their initial flurry with Wang Wauk and Bulahdelah State Forests the EPA don't appear to have attempted any further compliance action. We have consistently found in our audits that since then the Forestry Corporation are routinely failing to thoroughly search for Koalas elsewhere (i.e. Whian Whian, Richmond Range SF, Cherry Tree SF, Sugarloaf SF - see NEFA audits). The EPA dismiss all our complaints, often without even investigating them.

The EPA seem to have totally given up in 2015, For example a review of the 8 proactive audits undertaken by the EPA in the UNE in 2015 found the EPA didn't identify any breaches for not undertaking Koala scat searches, though they started the year documenting that across 3 operations they inspected 3.32 ha and saw no evidence of Koala scat searches, with the 21 Tallowwood assessed showing no signs of being searched. After May 2015 the EPA stopped identifying the area assessed for Koala searches and stopped identifying whether individual feed trees had evidence of searching, simply saying that they were not able to determine whether searches had been undertaken or not.

A recent example of the Forestry Corporation's refusal to undertake thorough searches for Koala scats ahead of logging and implement required prescriptions was in Gibberagee State Forest in 2019. In February 2019 NEFA inspected Gibberagee State Forest soon after logging commenced (see Forestry Case Study 3: Gibberagee State Forest). We found a widespread breeding colony of Koalas, as shown by most Grey Gums having distinctive Koala scratches and trees with >20 Koala scats. It was evident that the Forestry Corporation were not undertaking the required Koala scat searches to identify Koala High Use Areas in breach of their Threatened Species Licence and were not retaining the 5 Koala feed trees per ha as required in Intermediate Koala Habitat. There were also systematic breaches of habitat tree requirements.

In 2017 we had demonstrated non-compliance with the TSL in another part of Gibberagee, SF yet the Forestry Corporation had continued to log in contravention of the TSL, and the EPA had refused to require compliance - not even bothering to report on breaches until years after the logging was complete. Given this we decided to have a forest action on 13 February 2019, which was resolved when the Forestry Corporation agreed to a site inspection within a week with NEFA, and the EPA if they agreed, to inspect the breaches we had identified. The EPA declined a site inspection with us and a week later the Forestry Corporation reneged on their agreement..

NEFA returned on 24 February to audit recent logging. This involved a detailed audit of approximately 6 ha logged since February 13 and random assessments of adjoining areas currently being logged. We found that that the Forestry Corporation were still refusing to comply with their legal obligation to search for Koala scats and Koala High Use Areas ahead of logging, locating 3 Koala high use trees that had not been identified by the Forestry Corporation with >20 Koala scats (111, 21 and 42 scats) around their bases in areas that had been logged while the EPA were investigating. Our appeals for the EPA, the Environment Minister and the Premier were in vain.

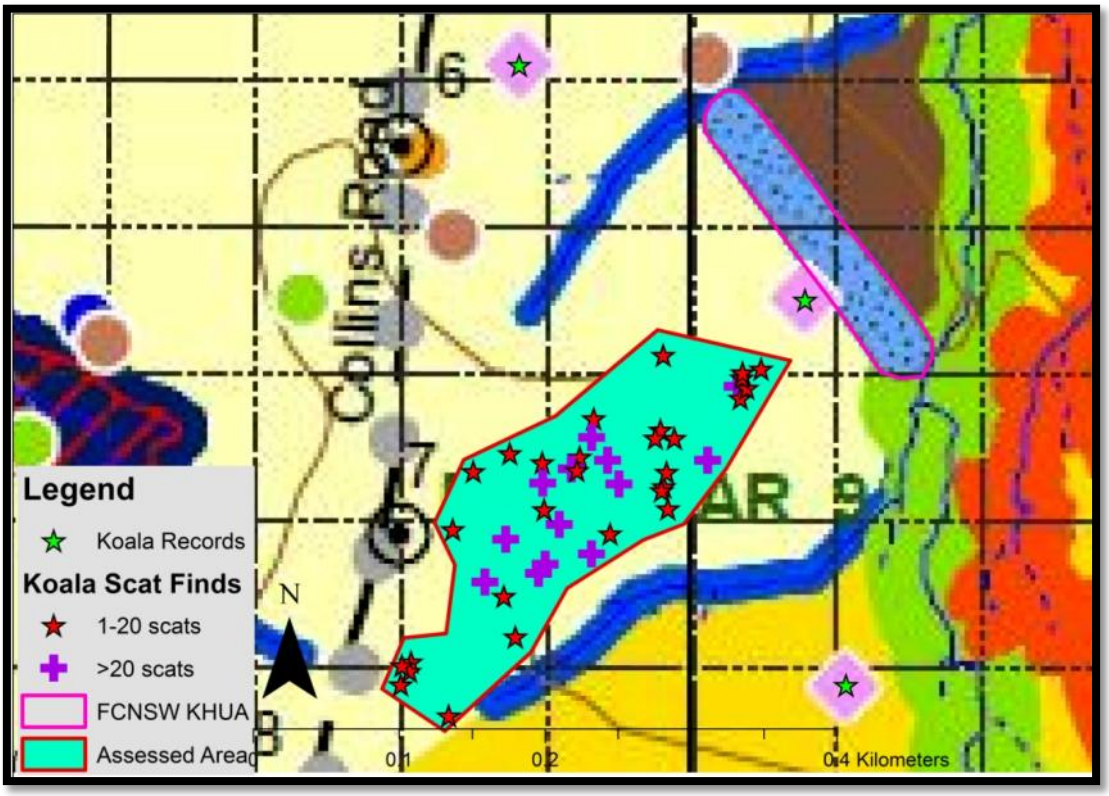
Within an area of Gibberagee SF logged by the Forestry Corporation while the EPA were investigating our complaints, NEFA located a Grey Gum marked as both an R tree and Yellow-bellied Glider feed tree, with Koala scratches and no evidence of searching. Numerous Koala scats were obvious on the surface (proving that whoever marked the tree had not even undertaken a cursory look for Koala scats) and 111 Koala scats were found by searching. Note the presence of different sized scats indicating the presence of a mother and joey.

We had another action at Gibberagee on 4 and 5 March to try and force pre-logging surveys for Koalas. To resolve the dispute we offered to fund a one day trial using a scat detection dog to identify Koala High Use Areas. The Forestry Corporation refused our offer, though logging was temporarily stopped.

We returned to undertake another Koala scat search, finding that the Forestry Corporation were still refusing to undertake scat searches, and identifying a Koala High Use Area in an area yet to be logged. As a token gesture the Forestry Corporation agreed to protect 1ha of the Koala High Use

Area, accept that the forest is Intermediate Koala Habitat and to retain the required 5 Koala feed trees per ha, and resumed logging of Koala High Use Areas in May.

The most recent example was NEFA's finding on the 28 July 2019 of a 3ha Koala High Use Area in Braemar State Forest marked up ready for logging. It is evident that the Koala High Use Area is far more extensive than identified so far, and that it is probable that other HUAs occur within the logging area. In this case the Forestry Corporation had identified 0.9 ha as a Koala High Use Area, though it appears that the 3ha we identified should have been an extension to this. We found that none of the trees searched by us had been searched before, despite the Forestry Corporation visiting many high use trees to mark them.



Results of Koala survey in Braemar SF on 28 July 2019. Note that the high number of records means that virtually the whole 3ha assessed qualifies as a Koala High Use Area, and that the Koala HUA likely extends well outside the assessed area, including to encompass the FCNSW Koala HUA.

This same contempt for Koalas and their habitats has been found in NEFA's regional assessments.

In NEFA's review Clearing Koalas Away (Pugh 2017) of DPI's Koala Habitat model an analysis of State Forests Biodata (from Wildlife Atlas) over the years 1997-2016, limited to high quality and very high quality habitat as mapped by DPI, reveals an average of 9.6 Koala observations, the hearing of an average of 3.6 calls and finding of 74.6 trees with Koala scats under them each year, despite requirements for extensive surveys. This is an extremely low strike rate for what is meant to be some of the best habitat left for Koalas in New South Wales.

In NEFA's review Clearing Koalas Away (Pugh 2017) of 22,586 ha of north-east NSW's public lands that were then currently being logged we found:

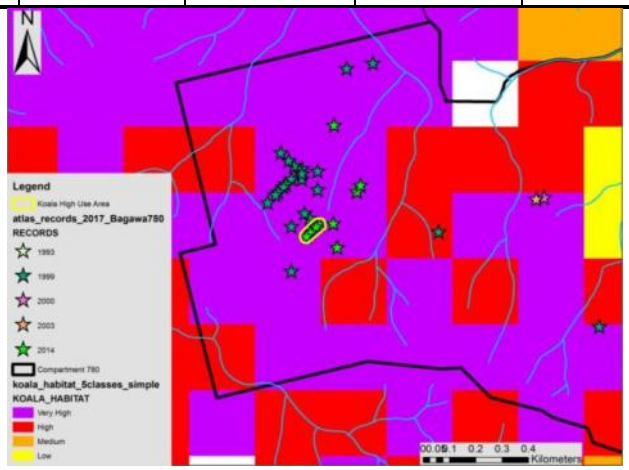
> *A total of 103 State Forest compartments covering 22,586 ha of public land have been identified as actively being logged as at June 2017 within the area of north east NSW covered by the Koala habitat model (Appendix 1).*

A total of 4,663ha of modelled high quality (including very high quality) Koala habitat and 4,530ha of moderate quality habitat occurs within areas currently being logged (Appendix 1). The Office of Environment and Heritage's Wildlife Atlas identifies a total of 357 Koala records occurring within 34 of the compartments. The Forestry Corporation's Harvesting Plans identify that a total of 2 Koala High Use Areas totalling 1.2ha have been identified for protection and 11 compartments have been classed as Intermediate habitat which (theoretically) requires increased tree retention. The Harvesting Plans also identify that 22 compartments are (in part) being logged at a higher intensity than allowed by the Integrated Forestry Operations Approval (IFOA).

Despite the clear intent of the IFOA to limit STS to 40% basal area removal, the harvesting plans (Appendix 1) make it clear that the Forestry Intends to practice what it calls "heavy" or "regeneration" STS in parts of 22 compartments that are currently being logged. Of the 10 logging areas (Appendix 1) comprised of more than 50% high quality Koala habitat, 8 are to be subject to intensive logging, with Harvesting Plans identifying maximum intensities of 69-85% basal area removal, with AGS practiced in two. The remaining 5 areas identified for intensive logging have 17-26% of their areas comprised of high quality Koala habitat. In total 13 of the 20 areas with >17% high quality Koala habitat are being targeted for "unlawful" logging. This intensive logging is effectively clearing (see Appendix 2).

Distribution of High Quality (including very high) modelled Koala habitat across State Forest Compartments being logged as at June 2017 in North East NSW.

Area of HQ habitat in cmpt. (ha)	Number of cmpts	Total HQ habitat (ha)	Cmpts with Koala records	Identified Koala HUAs	Cmpts identified as Intermediate Habitat	Cmpts with Intensive logging
> 100 ha	17	2492	10	0.5 ha	2	11
50 - 99 ha	16	1183	7		2	5
25 - 49 ha	21	794	13	0.7 ha	4	6
1 - 24 ha	19	200	1		2	0
other	30	0	3		1	0
TOTALS	103	4669	34	1.2 ha	11	22

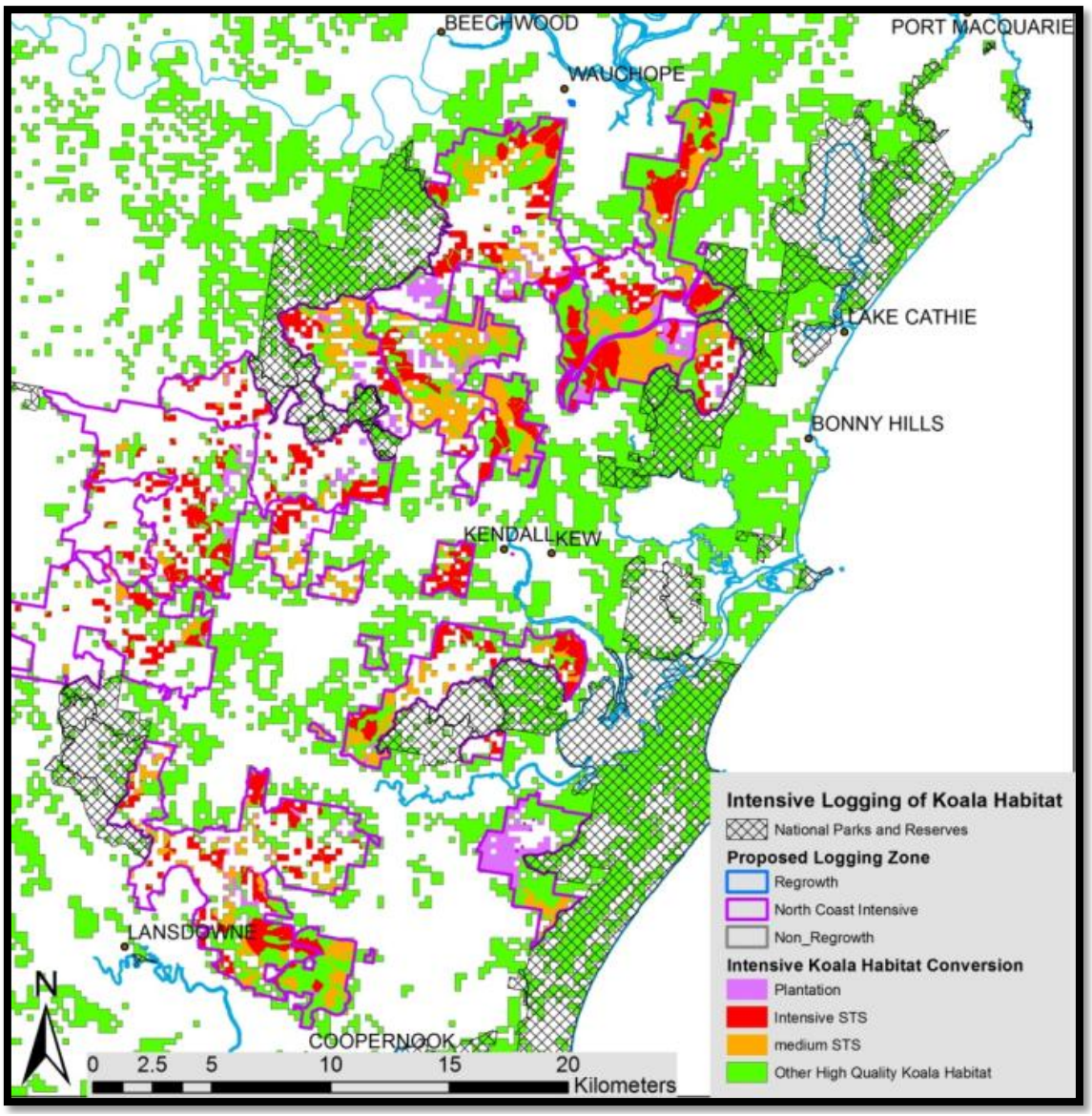


Bagawa SF Compartment 780, showing Koala habitat classes, records and the miniscule protected Koala High Use Area. And this is one of the best examples of current Koala protection. Note that the rows of 1999 records indicate where the Koala High Use Area would have been located in the previous logging, which is now available to be logged despite its obvious significance due to still being part of a Koala's home range 18 years later.

NEFA also finding:

In current logging operations there are 2 Koala High Use Areas: one 0.5ha in size in very high quality habitat in Bagawa SF (cmpt. 780), and one 0.7ha in size in moderate quality habitat in Wang Waulk SF (cmpt. 118). So of the 4,669ha of high quality habitat in compartments currently being logged only 0.5ha is identified in harvesting plans to be protected.

The reason that so little is protected is twofold, firstly because the EPA have set unrealistically high scat detection thresholds and miniscule buffers in the licence, and secondarily because the Forestry Corporation refuse to undertake the legally required "thorough" searches necessary to find sufficient scats to trigger protection. The EPA know that the Forestry Corporation are not undertaking thorough, if any, searches though refuse to take action.



Example of high (including very high) quality Koala habitat subject to intensive ("regeneration" and "heavy") and medium STS south of Port Macquarie over the past decade. It is no wonder that Koalas are rapidly declining in the area when it is considered that much of the high quality habitat outside State Forests has also been subject to intensive logging - including many areas incorporated into national parks in 1998 and 2003.

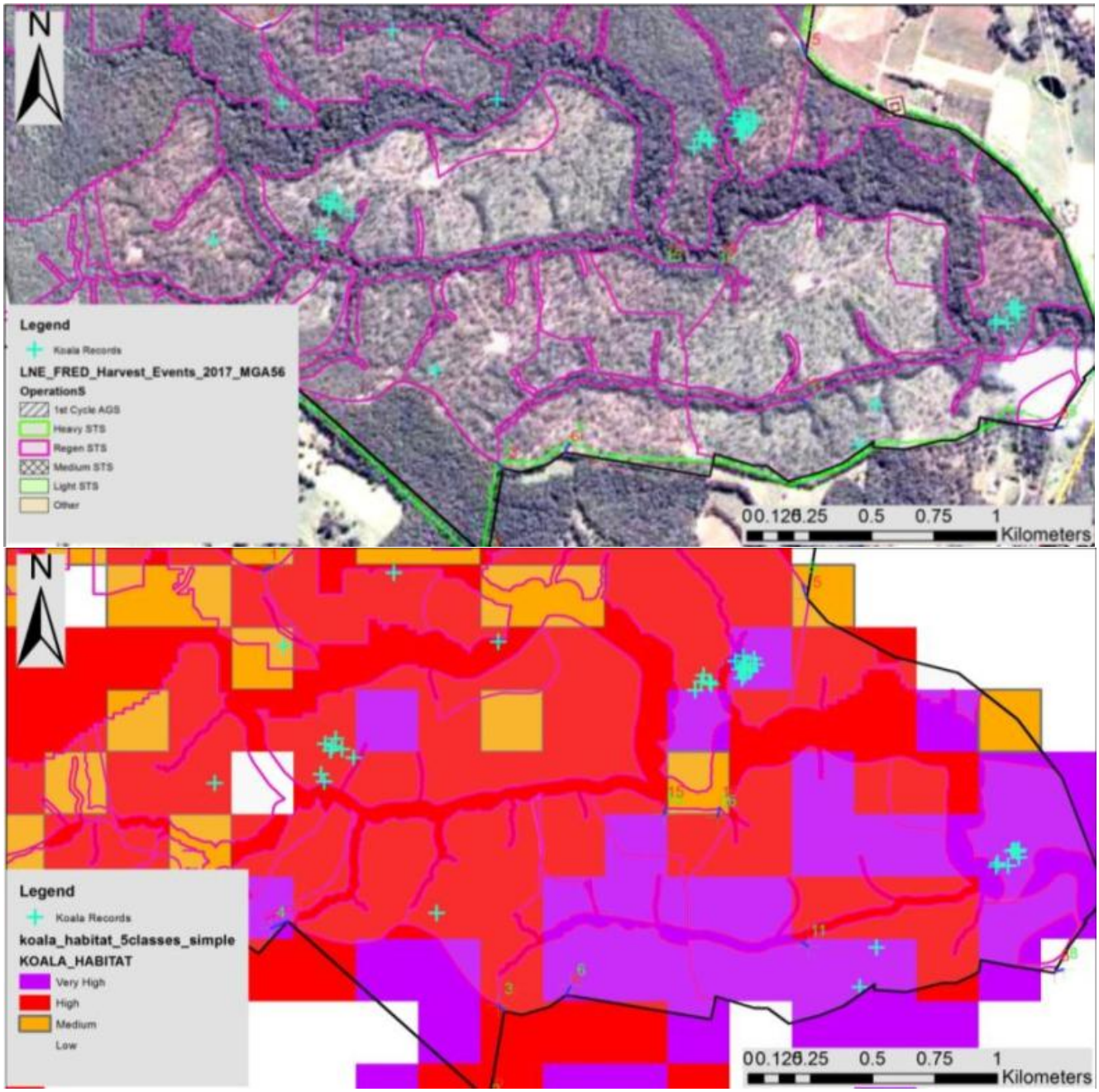
Single Tree Selection (STS) is the predominant logging regime applied in north east NSW's public forests, under this regime basal area removal is limited by the IFOA to 40%, yet starting in 2006 the Forestry Corporation began unlawfully practicing "medium:, "heavy" and "regeneration" STS . An examination of harvesting plans indicated that there is no clear definition of the various STS intensities, with "regeneration" STS involving average basal area removals ranging from 62-86% (average 75%), "heavy" STS from 50-85% (average 68%) and "medium" STS from 30-60%.(average 47%). It is however obvious that all the new STS regimes of "regeneration", "heavy" and "medium" are normally in excess of the IFOA definitions of STS as involving less than 40% basal area removal. From mapped logging intensities provided by the Forestry Corporation, NEFA's review *Clearing Koalas Away* (Pugh 2017) found:

> *A comparison of the mapped treated areas with modelled Koala habitat displays the same trend as other data, with the highest quality habitat subjected to the most intensive logging and conversion to quasi plantations. The "regeneration" and "heavy" STS treated areas are comprised of 39% high quality Koala habitat, with 244 koala records within treated areas. The "medium" STS treated areas are comprised of 28% high quality Koala habitat with 473 Koala records. While the patch clearfelling regime of Australian Group Selection is not allowed in Koala Intermediate Habitat because of its impacts. it is telling that 64% of the AGS treated areas are high quality Koala habitat.*

Despite this being a blatant rorting of the intent of Single Tree Selection the EPA refuse to do anything about it because they claim it is the Minister's responsibility to enforce the IFOA. The Minister for the Environment acknowledged, through a letter written by the Environment Protection Authority (EPA 2016b) on his behalf, that this type of harvesting as "*practiced by the FCNSW, is not consistent with the definition and intent of STS (Single Tree Selection) in the Integrated Forestry Operations Approval (IFOA) as well as FCNSW's own silvicultural guidelines*."

As identified in Clearing Koalas Away (NEFA 2017):

> *Since 2006 in the Lower North East region. the Forestry Corporation have subjected 74,906 ha to the unlawful logging practices of 'medium', 'heavy' and 'regeneration' Single Tree Selection involving 41-100% basal area removal. This is comprised of 23,742 ha (32%) of high quality Koala habitat and 717 Koala records.*
>
> *Regrettably it is clear that both the Conservation and Management Strategy and NSW Recovery Plan requirements relating to identifying and protecting important habitat areas, identifying improved and standardised survey methods, and monitoring and reviewing the effectiveness of mitigation measures, are not being complied with on public lands.*



Example of "regeneration" STS of high quality Koala Habitat in Cairncross SF, undertaken in 2012-13. There are 40 Koala records in this limited area dating back to 1980, with numerous records in 2011, 2012 and 2013 as it was being cleared. It is astounding that such obviously important Koala habitat was allowed to be virtually clearfelled. Even if no Koala High Use Areas were identified, the area qualified as an Intermediate Use area, with the intensive logging clearly illustrating the ineffectiveness of the current prescription.

In 2017 the Office of Environment and Heritage (OEH) analysed Koala records *"to delineate highly significant local scale areas of koala occupancy currently known for protection",* which they term Koala Hubs. A review of gross logging disturbances from satellite images (Pugh 2019) identified that the Forestry Corporation logged 2,546 ha of Koala Hubs from 2015-2018, with some 430 ha of Koala hubs logged since they were identified (see Forestry Case Study 4 - Koala Hubs). This means that over the past 4 years 21% of the loggable area of Koala Hubs within native forests on State Forests have been logged. The harvesting plans available online show that extensive areas of Koala Hubs are proposed for logging this year.

Given their abject failure to ensure compliance with the prescriptions, the EPA became intent on abolishing survey requirements for most threatened species and remove the need for the Forestry Corporation to have to do anything when threatened species are found. This extended to removing the need for the Forestry Corporation to search for Koala scats and identify Koala High Use Areas. The EPA (2014) undertook a biased and selective review of the Forestry Corporations survey data to justify stopping surveys for most species:

> *The NSW Government believes that the targeted survey approach used in the current IFOAs can be highly inefficient and that improvements in environmental outcomes over the past 15 years as a result of the surveys has been negligible, particularly when compared to the significant cost and effort required to undertake them.*

The Forestry Corporation claim to spend millions of dollars every year undertaking the required surveys, though they have little to show for it. A major part of the problem is that they use their own poorly trained staff to do most surveys. They are simply not capable of identifying many of the species they are meant to be looking for. They also suffer from a lack of will to find anything, which was particularly obvious at Royal Camp SF where the Forestry Corporation Mark-up Surveys failed to locate any Koala scats in an area with unusually abundant Koala scats, amongst the highest density of Koala scats on State forests in the Clarence-Richmond catchments.

It is apparent that very few Koala High Use Areas have been identified. The Natural Resources Commission (2016) identify that "*Around 200 hectares of koala high use area has been protected over the past 15 years and tree retention requirements have been triggered on around 33 percent of compartments (130,000 hectares)*". NEFA accepts that the relatively low identification of Koala High Use Areas partially reflects the collapse of Koala populations on the north coast, though considers it also reflects the ongoing refusal by the Forestry Corporation to thoroughly search for Koala scats ahead of logging.

NEFA agrees that the areas of habitat protected around records of threatened species is inadequate, though they still manage to protect fragments of important inhabited habitat for our most vulnerable species. Pugh (2016) assessed 13 areas of State Forest, totalling 10,661 hectares, scattered throughout the Clarence and Richmond River catchments and found that mapped fauna exclusions around records of threatened species (or the default protection of modelled habitat) resulted in protection of 278 ha (3%) of the gross area, outside base exclusions (ie FMZ 2 and 3a) and riparian exclusions.

NEFA (2016) have established (i.e. Koreelah State Forest) that many key fauna locations are not currently being identified in pre-logging surveys by the Forestry Corporation. Similarly, NEFA (2016) have established that the Mark-up Surveys required to be undertaken during logging to identify Koala High Use Areas, threatened plants, wetlands, *Philoria* habitat, bat roosts, Quoll latrines and various other exclusions are rarely undertaken adequately. The paltry number of exclusions for threatened plants reflects the extremely poor survey effort by anyone who knows what they are looking for.

In NEFA's (2016) review the result for Koalas was amongst the poorest, despite NEFA recording Koalas in many of the areas. In Ellis SF the Forestry Corporation identified two Koala High Use Areas which were included in a single exclusion zone of 7.3ha and in Royal Camp SF the Forestry Corporation had found one Koala HUA of 1.4ha before NEFA intervened. With the addition of Koala HUAs identified in NEFA's limited surveys (and verified by the EPA) of a small part of the area the Royal Camp Koala HUAs would have increased to over 10ha outside other exclusions.

The EPA ignored our requests for Koala surveys to be undertaken by independent experts, and recklessly pursued their intent to get rid of the requirements to search for, identify and protect Koala High Use Areas, contrary to the advice of their own Koala expert panel (EPA 2016) that "*the primary intent and focus should be to identify the location, distribution and extent of areas that are supporting extant/resident koala populations*".

1 (b) (i) 3. The New Coastal IFOA

Given the failure of the EPA to ensure that the Forestry Corporation complies with the Koala prescriptions of the 1999 IFOA, and despite the advice of their own experts that the highest priority is to undertake pre-logging surveys to identify and protect areas of occupied habitat, the EPA persisted with their intent to remove the need for pre-logging surveys for Koalas in the new Coastal IFOA. The new IFOA came into force in late 2018, though currently most logging in north-east NSW is still being undertaken under the 1999 IFOA.

The EPA's (2014) aim was to get rid of most species specific prescriptions for threatened species and focus on a landscape based approach to reduce *"the need to locate threatened species through costly surveys".* They go so far as to assert that *"The government considers that relying on record-based triggers for species protection is an unnecessary risk to most threatened species"*. The absurdity of this claim is astounding.

The EPA intent was to abandon any need to undertake pre-logging surveys for Koalas and replace it with prescriptions applied to various classes of modelled habitat. Regarding the Koala prescription the EPA (2014b) plagiarised the Forestry Corporation (2013) when they state:

> *This condition focuses on the process for searching for the presence of koalas and activity levels rather than the objective of the condition, which is to protect important and currently occupied koala habitat and retain preferred koala browse trees. The current condition is very time consuming to implement and searches under different trees or on different days can produce a different result. Conditions such as these are difficult to enforce due to complexities associated with establishing whether a search was done "thoroughly" or what number and size of scats the person doing the search observed.*

The EPA (2014b) told the General Purpose Standing Committee No. 5 'Inquiry into the performance of the NSW Environment Protection Authority':

> ***Core koala habitat mapping***
> *The EPA is mapping core koala habitat so that it can be protected at the landscape level. This is intended to replace the existing presence/absence triggers and is a far more effective way of ensuring koalas and their habitat are protected.*
> ***Regulatory improvements to ensure koala protection***
> *As part of the proposed consolidated Coastal IFOA, the EPA and Forestry Corporation have committed to moving to regional koala habitat mapping. As noted above, the EPA has commenced broad-scale mapping of koala habitat. The outcome of this mapping project will be used to inform appropriate conditions, including exclusion zones, the protection of feed trees and other alternative provisions in the consolidated Coastal IFOA.*

The problem is that the EPA (2016) has only been able to produce a map capable of identify the presence-absence of Koalas and has been unable to identify core koala habitat. Without surveys

this only leaves them with the option of reverting to the Forestry Corporation's position where the Forestry Corporation is empowered to select bits and pieces of forests (away from drainage lines) that they choose as ""“wildlife clumps” using some undeveloped guidelines and the retention of various numbers of feed trees based on inaccurate habitat quality mapping.

In 2016 the EPA undertook a project overseen by an expert panel to review various approaches to map potential Koala habitat, with extensive groundwork to test the mapping. The project found that neither modelling nor ecosystem mapping were accurate enough to identify the "*occurrence of feed trees and therefore habitat class at the level of detail required for management in state forests*", with the panel unanimously agreeing that "*the primary intent and focus should be to identify the location, distribution and extent of areas that are supporting extant/resident koala populations*".

In his review of the EPA's (2016) Pilot Mapping Project, Smith (2015) stated:

> *It is currently uncertain whether current koala conservation protocols are sufficiently precautionary to protect koalas under modern harvesting methods. There have been no conclusive scientific studies of the impacts of modern harvesting methods on koalas. The simplest and most cost effective way of addressing this problem would be to re-survey all sites with koalas that have been subject to pre-logging surveys during the past 18 years and use the data to identify any effects of changes in forest structure, food tree abundance and logging disturbance.*
>
> *...*
>
> *Based on current knowledge, any precautionary Conservation Protocols applied to potential koala habitat in crown and private forests would need to mimic the effects of past low intensity harvesting practices. This primarily involves limiting the basal areas of stems removed across a range of size classes. Guidelines for achieving basal area limited harvesting been applied for many years to regulate private forestry operations on privately owned Protected Lands (Smith 2001,2010, copy supplied). These guidelines may serve as a useful basis for revision and wider application of existing koala Conservation Protocols*

In his review of the EPA's (2016) Pilot Mapping Project, Phillips (2015) stated:

> *Because of the need to incorporate koala socio-biology and disturbance history as fundamental considerations there is little value in relying on categorisation of koala habitat alone to inform management in areas subject to logging.*
>
> *...*
>
> *In my experience it suits Government for timber harvesting approvals and processes to remain obfuscatory, when there is no reason that they should be. How could such matters be addressed / overcome? Transparency of process along with acceptance and application of best practice techniques (as opposed to trying to reinvent the wheel with no axle to place it on).*
>
> *...*
>
> *note that the question of what is being protected has also been raised. I would have thought that this was a question that should not have required an answer when surely the most important thing to protect are remaining areas of habitat that are currently supporting resident koala populations. This consideration remains independent of the issue of habitat quality and so should be the primary objective of management.*

Without any attempt to review the status of Koalas on State Forests, and despite evidence that Koala populations are crashing under Forestry Corporation mismanagement (EPA 2016), and despite clear evidence that their proposed approach will not be effective, the EPA continued to

develop their flawed model and remained intent on implementing the Forestry Corporation's position of removing the need for scat searches and the protection for core Koala habitat on public lands. Nobody cares about the Koalas.

Despite the conclusion from their study that modelling is too inaccurate for regulation at the scale of individual logging operations, the EPA funded DPI Forestry (Law *et. al.* 2017) to complete their model, despite its being considered as inadequate by the expert panel. This model was intersected with an OEH (2016) likelihood model to identify high/high, moderate/high and moderate/moderate quality Koala habitat.

Because of differences between the EPA and Forestry Corporation the Natural Resources Commission (2016) was directed to resolve a prescription based on a "*modest increase in tree retention rates aim to minimise impacts on wood supply to best possible extent while recognising Government's policy initiatives and targeted investment in Koalas as an iconic species (**no net change to wood supply**)*".

The EPA (NRC 2016) proposed a retention rate of "*25 trees per hectare in High/high quality habitat, 20 trees per hectare in High/moderate quality habitat, and 15 trees per hectare in Moderate/moderate quality habitat*". The NRC over-rode the EPA to support a retention rate proposed by the Forestry Corporation specifying "*10 healthy trees per hectare with cell based application in High/high quality habitat, 5 trees per hectare with compartment wide application in High/moderate or moderate/moderate cells over 25 percent or more of compartmen*t".

Under the new prescriptions Koala browse trees are required to be greater than 20 cm diameter at breast height (DBH) (30cm DBH outside the north coast). The EPA (NRC 2016) proposed that "*retain trees with minimum 25 centimetre diameter DBHOB, prioritising primary browse species, then secondary browse species:*". The NRC over-rode the EPA to support the Forestry Corporation, deciding "*retain trees with minimum 20 centimetre diameter DBHOB, retaining trees where available with 50 percent primary browse species*".

The outcome is a map of very restricted highest quality Koala habitat and a broad map of compartments with more than 25% "moderate" quality Koala habitat. In the high quality habitat the requirement is to retain up to 10 browse trees >20cm DBH per hectare in the vicinity, and in moderate quality habitat the proposed requirement is to retain up to 5 browse trees >20cm DBH per hectare.

Under the new Koala prescription the area of State Forests for which 10 trees/ha >20 cm dbh will need to be retained is just 36,152ha (out of almost a million ha) and the area where 5/ha will need to be retained is 212,073 ha. Requirements under the 1999 IFOA for 5/ha Koala feed trees in intermediate use habitat was already triggered on around 33 percent of compartments (NRC 2016) so overall tree retention is likely to be lower.

In their submission to the new logging rules, the Office of Environment and Heritage (2018) complained that the new Koala feed tree retention rates are less than half the number and of a smaller size than proposed by the Expert Fauna Panel, concluding that the increased logging intensity proposed under the new rules is expected to impact Koalas through diminished feed and shelter tree resources:

> *Koalas are selective both in their choice of food tree species and in their choice of individual trees. The scientific basis for proposed tree retention rates in the Draft Coastal IFOA is not clear, and the rates are less than half those originally proposed by the Expert Fauna Panel.*

While Koalas will use small trees, research has shown that they selectively prefer larger trees. In our experience, the proposed minimum tree retention size of 20cm dbh will be inadequate to support koala populations and should be increased to a minimum of 30cm dbh. Many Koala food trees are also desired timber species, so there is a high likelihood that larger trees will be favoured for harvesting, leaving small retained trees subject to the elevated mortality rates experienced in exposed, intensively-logged coupes.

Koalas require large areas of connected habitat for long-term viability. The increased logging intensity proposed under the draft Coastal IFOA is expected to impact Koalas through diminished feed and shelter tree resources. Animals will need to spend more time traversing the ground as they move between suitable trees that remain, which is likely to increase koala mortality.

It is evident that the EPA list of feed species fails to include numerous browse species. This means that where there are less than 5 or 10 browse trees per hectare, alternative unlisted browse trees are allowed to be logged rather than retained.

43% of the mapped high quality Koala habitat on State Forests is within the North Coast Intensive zone and thus intended for clearfelling. Illegal logging in these forests over the past decade has focussed on replacing Koala feed trees with Blackbutt.

In abandoning any measures to ascertain whether Koalas are present in an area, the EPA have deliberately abandoned any measures to identify and protect resident Koala populations and will instead often provide their limited protection to uninhabited and unsuitable habitat while allowing logging of the best habitat left. The Forestry Corporation can now log high-use koala habitat at their whim.

Under the new Coastal IFOA the need to retain 3-5 *"mature or late mature individuals"* as Eucalypt Feed Trees will also be removed. The new rules only require the retention of 5 mature trees per hectare within compartments within 2km of existing (<20 yr old) records of Swift Parrot and Regent Honeyeater. Together these requirements, based on 2019 records (less than 20 years old), encompass 16,856 ha (3.2%) of the general purpose logging area (FMZ4) in north-east NSW. There will no longer be any requirements to protect mature Eucalypt Feed Trees in most logging areas, the loss of these larger trees will have a significant impact on Koalas. NEFA estimates that under the new Coastal IFOA at least some 2-2.5 million mature trees in north-east NSW have had their required protection rescinded.

In accordance with the existing TSL exclusion areas are required to be established around the records of Brush-tailed Phascogale (20ha) and Squirrel Glider (8ha). Under the new Coastal IFOA the exclusion areas already protected for these species will be retained, though there will no longer be requirements to survey for and protect additional areas. Many other exclusion zones for other threatened species are also being removed. Taken together these will reduce the habitat available for Koalas.

The impacts on Koalas from these changes to the Coastal IFOA will be greatly amplified by the Coastal IFOA's reduction in buffers to headwater streams from 10m down to 5m, the almost doubling of allowable logging intensity, and the removal of the need to protect recruitment habitat trees (mature trees required as future hollow-bearing trees). NEFA estimates that protection will be removed from some 22,000 ha of riparian buffers north from the Hunter River. The loss of vital riparian refuges and more mature trees will significantly compound impacts on Koalas.

The NSW Government is also proposing to log some 15,000 ha of currently protected oldgrowth forest over the next 20 years. The loss of the mature and oldgrowth trees in remapped areas will significantly compound impacts.

Despite north-coast Koala populations crashing by 50% over the past 15-20 years, in part due to the logging of core Koala habitat and the loss of mature feed trees through logging, the Forestry Corporation and EPA are removing the need to identify and protect occupied Koala habitat. They are prioritising the protection of virtual Koalas over real Koalas, while targeting half of the high quality modelled habitat for the most aggressive logging and conversion into quasi-plantations. This is clearly not compliant with the Commonwealth Conservation and Management Strategy and NSW Recovery Plan requirements.

1 (b) (i) 4. Monitoring

Monitoring of changes over time in response to different management is a key requirement of Ecologically Sustainable Forest Management (ESFM). When monitoring is used as a tool to improve management it is termed Adaptive Management. As laudable as Adaptive Management is, and while Governments like to pretend that they practice it, most often it is just used as a smokescreen to justify inappropriate activities.

The application of ESFM and Adaptive Management were key undertakings of the 2000 North East NSW RFA, though in practice there has been very little monitoring. Prescriptions for threatened species have never been monitored to assess their effectiveness. While there were numerous reductions in protections for threatened species over the life of the 1999 IFOA, there were no increased protections. None of the reductions were based on monitoring of the effectiveness of prescriptions and none of changed prescriptions were subject to trials to assess their effectiveness before being implemented.

In relation to biodiversity Forests NSW (2005) ESFM Plan notes:

> *Forests NSW will use adaptive management principles and actions within State forests to complement the management of the CAR reserve system.*
>
> *…*
>
> *During operations, site specific conditions are continually assessed, results recorded, the appropriateness of operational conditions reviewed and plans amended where necessary.*

NEFA have come across no evidence of this, quite to the contrary the Forestry Corporation does not learn from its mistakes, which is exemplified by their ongoing refusal to undertake the scat searches necessary to identify Koala High Use Areas. We are most concerned that neither the EPA nor Forestry Corporation have bothered to assess the effectiveness of any fauna prescriptions over the past 15 years and improve them accordingly. The deal between the Forestry Corporation and NPWS to remove monitoring requirements for Koalas from the TSL in 1999 says it all. Rather than applying adaptive management as a routine practice we find that Forestry Corporation use it as an excuse to continue logging in blind ignorance - because they don't want to know the consequences of their actions.

As part of the CRA process an ESFM Biodiversity Workshop was held at Coffs Harbour in August 1998 to review the conservation protocols for fauna (DUAP 1998). The workshop included a variety of experts, agency staff and stakeholders. From the recommendations that were made at the workshop, a few of these were unanimously supported, including:

- *Monitoring is critically important and complex and should not be put into the 'too hard basket' — therefore an action is required immediately (pre RFA). The monitoring program should include the conservation protocols but not be limited to these. Monitoring in conjunction with predictive capacity is required.*
- *Monitoring is not an end in itself but should be used to validate the predictive models/or assumptions of the future*

NEFA actively promoted the need for monitoring of the effectiveness of prescriptions as a key outcome of the IFOA, and we were reassured this would be done. The need to wait for monitoring results has become an ongoing excuse for inaction as the monitoring is never done. Ignorance is used as the excuse for continuing with business as usual while Koala populations plummet. Adaptive Management has become the refuge of rogues.

There were dramatic changes to the 1997 TSL Koala prescription in 1999. The need to undertake pre-logging surveys to identify high use areas was removed and replaced with surveys at the time of logging, the need to search for scats within 2m of a tree was reduced to 1m, the recognition of any area where any 2 out of 10 consecutive trees search was identified as a high use area was changed to require a trigger tree (ie sighting, >20 scats, mother and baby) and 3 out of 10 trees consecutively searched with scats, the need to exclude logging from within 50m of high use areas was reduced to 20m, the need to protect individual trees with >20 scats was removed, and the need to protect ten primary browse trees (or secondary browse species if primary are unavailable) per hectare in intermediate use areas was reduced to 5 per hectare.

There is no evidence that a single one of these significant reductions in protections for Koalas was based on any monitoring of impacts on Koalas, or any trials of their effectiveness, rather they were simply aimed at reducing the area of forest affected to make more forest available for logging..

This is exemplified by the 1999 changes to the TSL Koala prescription removing the clause relating to monitoring (TSL p139) of Koalas:

> ***Monitoring:***
> *Koala monitoring will be conducted as part of the general monitoring procedures planned by SFNSW. Compartment monitoring may be advantageous to Districts for future planning in areas that have positive Koala records and prior management.*
>
> *At the initial stage the state wide monitoring of Koala populations will require a comprehensive compilation of the location and extent of high use areas. The monitoring program will be designed to give information on the effectiveness of these prescriptions in meeting their objectives.*
>
> *The survey methodology for detecting Koalas and determining high use areas (contained in these prescriptions) may be reviewed in the light of findings from the monitoring program.*

Despite monitoring having been a requirement for 2 years it appears that none was undertaken and the subsequent changes purely based upon increasing timber yields.

In 2003 'Condition 5.2.c) vi Koala Mark-up Searches' was revoked:

> *iv If, while conducting the Star search any of the features listed in condition 5.2.2 (c) i. above are located along a transect, the original Star search must be completed and another Star search must begin from this point or area.*

This change was to stop the need to do additional star search for each additional high use tree found. This has the effect of stopping star seaches from identifying the full extent of Koala HUAs in all directions, thereby further reducing the area of forest protected. Other changes at that time allowed trees to be felled into Koala HUAs. Once again there was no monitoring or trials.

Further changes in 2013 had the effect of removing the need for compliance with a Pine Creek Local Koala Management Plan.

In his review of the EPA's (2016) Pilot Mapping Project, Kavanagh (2015) stated:

> *A priority for the project should be to gain a better understanding of the responses of the Koala to disturbance, in particular to logging. This is crucial for the development of appropriate management prescriptions to apply within areas proposed for logging. Regardless of the predictions of the models and maps described above, the appropriate management responses to predicted high population density, or occurrences of preferred Koala habitat, are still unknown. This is because there has been no rigorous, experimental, study in the coastal forests of NSW that has documented the effects of logging on the Koala.*
>
> *An interim (but less conclusive) approach may be to investigate and collate the results of post-logging assessments of Koala presence within RFA (Regional Forest Agreement) coupes that have been previously assessed and logged within the past 16 years. It should be noted that all current and proposed logging prescriptions to manage/conserve Koalas on Crown Lands and in Private Native Forests in this region are precautionary only, with no sound scientific basis for their application.*
>
> *...*
>
> *Regardless of the predictions of this map, or any other map, the appropriate management responses to predicted high population density, or occurrences of preferred Koala habitat, are still unknown. This is because there has been no rigorous study in the coastal forests of NSW that has documented the effects of logging on the Koala. All current and proposed logging prescriptions to manage/conserve Koalas on Crown Lands and in Private Native Forests are precautionary only, with no sound scientific basis for their application.*

The need for monitoring identified by Smith (2015) and Kavanagh (2015), has (not unsurprisingly) been reiterated by the Chief Scientist:

> *In many cases, the reliance on traditional point-in-time surveys (such as scat surveys conducted according to licence conditions under IFOAs) has proven ineffective at providing data on population trends, as they are not designed for comparative or repeat surveying (Woosnam-Merchez, Cristescu, Dique, Ellis, Beeton, Simmonds, & Carrick, 2012; Slade & Law, 2016). A robust monitoring program is essential to understand the impact of interventions and activities at a landscape scale and at specific sites and how populations respond over time. A targeted monitoring program is especially important in remote areas that may not be regularly visited by the public or researchers.*
>
> *All major infrastructure projects and natural resource management activities have a local impact on the environment. However, further information is required on how this impacts the broader koala population over time. Monitoring is essential to manage a range of threats. It is also important that effective monitoring of actions is undertaken to ensure that management decisions are founded on 'best available science'.*

It is blatantly clear that the survey methodologies applied under IFOA licence conditions for Koalas are not robust or repeatable as the scat searches are applied in an ad-hoc manner by poorly trained and unwilling foresters who often make no attempt to systematically search areas and usually don't record what they find. Even in the rare event that they find a Koala High Use Area there is no attempt to collate the results or permanently record them (because they don't want to have them recognised next time they log). The fact that most foresters appear antagonistic to the need to look for and protect Koalas means that none of their results can be relied upon.

What is most alarming is that for years it has been apparent that the Koala prescriptions have largely been ineffective, meaning that Koalas have only received token protection for the past 20 years. This is exemplified by the Forestry Corporation only identifying some 200 ha of Koala High Use Areas out of the hundreds of thousands of hectares logged over this time. Despite this there have been no attempts to change the prescription to improve its effectiveness and enforceability. Even when the Forestry Corporation offered to place a minimum size limit (30cm dbh) on retained Koala feed trees the EPA failed to implement it.

Given that Forestry have been pretending to be operating under the premise of Adaptive Management for the past 20 years, it is outrageous that they now have totally changed the Koala prescription in the Coastal IFOA, in contravention of expert opinion and without any monitoring or trials. Given the high likelihood that the new prescription will result in a significant reduction in Koalas it is hard to fathom what the performance measures could be - no more than a 70% reduction in Koalas?

The pretence that we can continue to log Koala habitat under a new intensified regime while some form of undoubtedly token monitoring is undertaken is truly outrageous. At the very least there should have been a trial of the new prescriptions to assess their effectiveness before they were adopted.

There have been a variety of systematic surveys using repeatable methodologies undertaken at various locations across the forest estate over the past 30 years by reputable experts that could be rapidly resurveyed if there was a will to identify population trends. Though the idea of continuing business as usual while Government agencies continue to pretend that they intend to do monitoring sometime in the future is no longer acceptable.

1 (b) (ii) the impacts on koalas and koala habitat from the Private Native Forestry Code of Practice

In NSW some 35-38% of the remaining forests are privately owned and 29% are leasehold (Prest 2003). Private Native Forestry (PNF) is centred on north-east NSW where private forests constitute 46% of the area of commercial forests and provides a third to half of sawlog production in north east NSW (Prest 2003). This means that a large proportion of Koala habitat also occurs on private property and is actively being logged.

The Endangered Fauna (Interim Protection) Act put it beyond doubt in 1991 that Koalas were required to be protected in Private Native Forestry (PNF) operations, there followed a long period of inaction on behalf of Government agencies while PNF continued unabated. When SEPP 46 was introduced in 1995 it included an exemption for PNF (outside 'protected lands') that was carried over into the Native Vegetation Conservation Act in 1997 and resulted in all PNF operations (outside 'protected lands') being undertaken without any constraints to protect threatened fauna, including Koalas, because DLWC chose to ignore sustainability and threatened species (including Koala) requirements.

SEPP 44 was introduced in 1995 with the objective of identifying and protecting core Koala habitat on private lands, but since then only 5 Comprehensive Koala Plans of Management have been prepared, and only 2 of these identify core Koala habitat across Local Government Areas. So after 24years there is still no protection for core Koala habitat on most private lands.

It is clear that the NSW Recovery Plan's objective to *Conserve koalas in their existing habitat* by identifying and protecting 'core Koala habitat' in accordance with SEPP 44 and by LEP zoning has not been implemented. If there is any will to protect Koalas then it is essential that significant resources be put into mapping core Koala habitat across priority private lands and retaining the current requirement to exclude logging from core Koala habitat.

In 1998 DLWC developed best management principles for logging, which were replaced with "*Interim Guidelines, A Guide to Managing Private Native Forests in North-east NSW*" in 2000. These made no mention of Koalas and had no requirements to identify or protect Koalas in any way. The application of these was still effectively limited to 'protected lands'.

It wasn't until 2007 that PNF Code of Practices that made mention of Koalas were introduced and applied to all PNF logging operations. The Department of Environment and Climate Change was put in charge of the implementation of the Code though the DLWC staff who had been responsible for lax regulation for years were transferred to implement it.

After 16 years of obfuscation and delay since the legal requirement was identified, there was finally some protection for Koalas in PNF operations, though this was mostly theoretical. The Koala prescription established a need to exclude logging from identified core Koala habitat, the retention of 15 potential feed trees (30cm dbh) per hectare where there is evidence of Koalas, and set a high threshold (finding 20 scats) for the establishment of 20m exclusion zones around specific trees being used by Koalas.

Though, as intended, as core Koala habitat has only been mapped in limited areas, there are few existing records of Koalas on private lands and no requirements in the PNF Code to survey for

Koalas, the prescription is likely to have achieved very little in practice, as exemplified by the contempt for Koalas displayed by the Forestry Corporation and EPA at Whian Whian.

The veil of secrecy surrounding private property logging hinders public accountability and encourages lax enforcement by captured regulatory agencies. The glimpses we have had of the regulator's performance since 2007 reveal numerous transgressions including approving thousands of hectares of core Koala habitat identified in a KPoM for logging, wrongly remapping thousands of hectares of oldgrowth for logging, wrongly remapping critically endangered lowland rainforest for roading, and turning a blind eye while roads are pushed through exclusions areas for Koalas and threatened plants.

It is astounding that with its significant and extensive environmental impacts that PNF is exempt from the requirement to prepare a Development Application that addresses environmental impacts. PNF operations must be subject to the same level of assessment and public scrutiny as all other developments on private land, including the preparation and public exhibition of a Development Application or equivalent assessment. When neighbours raise genuine concerns they must be dealt with fairly, openly and justly, rather than belligerently, if there is a genuine attempt to gain community acceptance. Though most importantly there needs to be a genuine attempt to manage forests on an Ecologically Sustainable basis that protects environment values, including threatened species and streams, and logs in a careful and selective manner.

In potential Koala habitat where core Koala habitat has not been identified it is essential to require pre-logging surveys for Koalas and to fully protect any core Koala habitat found, as well as any trees with evidence of use by Koalas (scats, scratches, sightings) and appropriate buffers.

As with public forestry, for decades regulatory agencies have refused repeated requests from a diverse range of stakeholders and experts to monitor the effects of PNF on Koalas in order to assess and improve the effectiveness of prescriptions.

Regrettably it is clear that both the Conservation and Management Strategy and NSW Recovery Plan requirements relating to identifying and protecting important habitat areas, identifying improved and standardised survey methods, and monitoring and reviewing the effectiveness of mitigation measures, are not being complied with on private lands.

There is still no meaningful protection for Koalas on private lands subject to logging. If the Government is serious about the survival of Koalas then meaningful measures need to be applied to stop the open-season on Koala habitat on private properties. This must apply a precautionary approach, involving:

- **Providing greater transparency and public accountability by requiring Development Applications for PNF as is required for all other significant developments.**
- **Requiring pre-logging surveys to identify the distribution of Koalas, and other threatened species, and core Koala habitat (where it hasn't been identified in a CKPoM)..**
- **Maintaining the prohibition on logging of core Koala habitat, and fast-tracking its identification in CKPoMs;**
- **Adoption of precautionary prescriptions in potential Koala habitat and habitat linkages that require the retention and restoration of multi age forests and mature feed trees.**

- **Subjecting prescriptions to scientific scrutiny and monitoring to assess their effectiveness and identify needed improvements.**
- **Providing incentives to private property owners who agree to provide permanent protection to core Koala habitat.**

1 (b) (ii) 1. Pre-PNF Code

Some controls over logging of protected lands, steep lands and selected riparian areas, has existed since 1972, with areas outside these basically unregulated. It is apparent that the National Parks and Wildlife Act 1974 established the need for people undertaking activities likely to cause harm to species, such as Koalas, to obtain a licence. Though this was not clearly established to apply to PNF until the introduction of the Endangered Fauna (Interim Protection) Act 1991.

That Endangered Fauna (Interim Protection) Act 1991 was introduced in response to a court challenge by NEFA and a finding that, on both public or private land, logging was unlawful without a licence granted under the National Parks and Wildlife Act 1974 to take or kill threatened species (including the Koala) were required for logging operations in NSW. Of the hundreds of PNF operations subsequently undertaken, Prest (2003) found that from 1991-1995 only 9 PNF operations were licensed by the NPWS, and that from 1997-2000 only 3 s.91 licences were issued by NPWS.

In 1992 a Legislative Council (opposition) amendment to the Timber Industry (Interim Protection) Act inserted a framework for regulating private forestry that would be activated by the making of a regulation. The regulation was never made.

In 1995 State Environmental Planning Policy No. 44, 'Koala Habitat Protection' (SEPP 44) was introduced (see next section). Also in 1995 SEPP No. 46: 'Protection and Management of Native Vegetation' was introduced as an interim measure to regulate clearing of private lands, it required landholders to seek development consent prior to logging or clearing though included a variety of exemptions from requiring development consent, including for 'authorises' plantation establishment and for PNF:

> *Private Native Forestry. The clearance of native vegetation in a native forest in the course of its being selectively logged on a sustainable basis or managed for forestry purposes (timber production).*

SEPP 46 was replaced by the Native Vegetation Conservation Act in 1997 which carried on the PNF exemption. The poor wording of the PNF exemption effectively allowed any logging operation "*for forestry purposes*" to claim an exemption, and left it open for those "*who wish to use an exemption to make a "self-assessment" as to its scope, and to lawfully commence clearing or logging under exemption without informing DLWC*" (Prest 2003). While DLWC publicly tried to pretend that the exemption only applied to "sustainable" logging, Prest (2003) identifies that DLWC's (2000) internal 'Review of Exemptions' report stated

> *the wording suggests that non-sustainable forestry is also permissible under this exemption ... Due to the location of "or" in the exemption there is no other interpretation possible ... This exemption in effect, allows any clearing of native forests without consent so long as timber is being produced.*

Prest (2003) considers it probable that the intent of the exemption was originally to encourage sustainable logging but that the alternative "managed for forestry purposes" "*was added at the last*

minute following lobbying from rural and timber interests". One DLWC officer was later to complain "*This exemption is so ... lacking in any definition that logging of non-protected lands is effectively unregulated by the NVCA. It would be absolutely impossible to convict anyone for alleged breaches that involve forestry*" (Prest 2003).

As a result, irrespective of their nature, 100% of PNF operations outside 'protected lands' in the North Coast and Hunter regions claimed the PNF exemption (Prest 2003), and despite SEPP 44 nothing what-so-ever was required to be done to protect Koalas. Prest (2003) found:

> *PNF was the most important cause of native vegetation "clearing" within the category of all types of approved vegetation clearing between 1999-2001 inclusive. If PNF logging under exemption were to be included ... it is abundantly clear that PNF would have been, by a considerable margin, the most important cause of native vegetation clearing in those regions.*

For example in 2002 PNF approvals for protected lands accounted for 81.2% of the area approved for clearing in the North Coast region, with the PNF exemption accounting for many times this (Prest 2003).

It is revealing that Prest (2003) found that while the DLWC North Coast and Hunter regions just told people wanting to undertake PNF to apply the exemption, at their worst "*turning a blind eye to the impact of logging under exemption*", in the Sydney-South Coast Region DLWC negotiated with landholders to obtain concessions relating to their logging operations in order to obtain the exemption. Similarly of all the applications for PNF on protected lands in the North Coast and Hunter regions from 1997-1999 not one was refused.

The Native Vegetation Conservation Act 1997 also allowed for the preparation of a Code of Practice (COP) as an exemption. Due to the broadness of the PNF exemption, it was recognised by some DLWC staff that a COP for PNF was required to at least provide some semblance of regulation.

Prest (2003) undertook a review of regulation of private forestry in NSW over the period 1997-2002, and concluded:

> *It was found that PNF was infrequently regulated under the Native Vegetation Conservation Act, primarily due to a problematic exemption for specified types of PNF. In the North Coast and Hunter regions the exemption was claimed by 100% of PNF operations (on land tenures where it was available). PNF was found to be infrequently regulated by local government under Local Environment Plans (64.5% of 107 local governments did not regulate PNF in the main rural zone). The safety net mechanism of licensing under the Threatened Species Conservation Act was infrequently applied with only five licences granted for PNF. Regarding law enforcement, a low level of prosecution activity was found to have taken place.*

Prest (2003) considers:

> *The findings support the proposition that in practice NSW law was inadequate to ensure ecologically sustainable forest management, due to the poorly designed and integrated statutory framework. They also provide some evidence to support the proposition that the applicable laws were generally implemented with a light touch, generally expressing a* laissez faire *approach to PNF in most regions (with some exceptions).*

In 1998 DLWC developed best management principles for logging which included a wide variety of habitat retention requirements and exclusion areas for biodiversity and threatened species, as well as limiting canopy removal as a key component of ecologically sustainable logging.

It is revealing that DLWC did not consider that any of the PNF applications they considered throughout NSW from 1997-2002 were likely to have a significant effect on any threatened species as no Species Impact Statements were required (Prest 2003).

In 2000 the North East NSW Regional Forest Agreement committed the State Government to producing a Code of Practice for timber harvesting of native forests on Private Lands by 2005, The Government gave the task to the Forestry Advisory Council. A consultancy report (Andrew Smith 2000) was prepared for DLWC which developed draft guidelines for ecologically sustainable forestry, though due to lobbying of the Minister and Director General by timber industry interests it was ignored. Smith (2000) required the exclusion from logging of 25% of wet and dry sclerophyll forests when koalas are found, reduced logging intensities as well as limits on clearfelling techniques.

DLWC then commissioned Bruce Cole Clarke to prepare a paper on operating standards for PNF. This paper was prepared in consultation with DLWC and timber industry representatives, conservation groups were excluded. In August 200 DLWC released their "*Interim Guidelines, A Guide to Managing Private Native Forests in North-east NSW*" as a fait accompli. There was no mention of Koalas. NEFA (Susie Russell 4 January 2001) commented to the media:

> *Under the Department's proposals I would be free to drive a bulldozer into the middle of a Koala colony and cut down most trees with Koalas in them. I would still be complying with DLWC's best operating standards and thus exempt from the Threatened Species Conservation Act*

The Nature Conservation Council (Pugh 2001) strongly recommended " *that a monitoring program be incorporated into the implementation of DLWC's best operating standards*" and "*that DLWC establish a number of sites to measure pre and post logging values, so as to gauge the efficacy of prescriptions*". At that time NCC proposed retention and restoration of multi-aged forests, along with the Forestry Commission/NPWS original prescription for Koalas as existing best practice:

> *Establish an exclusion zone encompassing all Koala high-use areas (as determined by appropriate surveys) and 50 metres around all high use areas.*

The National Parks and Wildlife Service, who had been excluded from development of the draft Code, submitted (August 2002):

> *NPWS is not supportive of the proposed exemption in its current form given the extent and level of harvesting proposed, the definition of old growth forest and rainforest, the inconsistency of prescriptions proposed from public land and private land, and the list of items in Schedule 1. In particular, the proposed draft exemption and operating protocols are not considered to be of minimal environmental impact and are inconsistent with other definitions and prescriptions.*
>
> *NPWS maintains its position that there should be consistency in protective measures for threatened species across all land tenures. The threatened species provisions of the IFOA reflect the negotiated outcomes of experts from within SFNSW and NPWS. These measures seek to provide a balance between conservation of threatened species and ecologically sustainable forest management. …. NPWS reiterates its view that the conditions of the IFOA should be applied across all land tenures with appropriate modification to certain aspects to reflect the intensity of the operation.*

At that time DLWC did have guidelines that required flora and fauna surveys where a PNF operation seeking consent (ie on protected lands) involved removal of more than 70% of the canopy or covered over 200ha. Otherwise existing records were relied upon.

Along with many others, NCC (Pugh 2001) also emphasised the need for surveys:

> *As part of the planning process pre-logging surveys by a qualified fauna survey professional must be undertaken at the appropriate season and use methods which maximise the likelihood of locating those of the following species, nest, dens, roosts and high use areas that are likely to occur on the property;*

Prest (2003) points out that the requirement of Section 118D of the National Parks and Wildlife Act only makes it an offence to damage habitat of a threatened species "*if the person knows that the land concerned is habitat of that kind*", commenting that that this "*encourages private landowners and forestry operators working on private land to deliberately avoid investigation of threatened species issues prior to commencing work"*: Ignorance is bliss.

The Native Vegetation Conservation Act 1997 also intended to overcome the piecemeal approach that had developed over the years for native vegetation management by establishing Regional Vegetation Management Committees (RVMCs) to develop holistic Regional Vegetation Management Plans. With no resources to undertake required studies, grossly inadequate vegetation mapping, lack of direction and conflicting advices from the DLWC, and prolonged delays the process was a shambles. The RVMPs were required (s.27 (2)) to provide for adequate protection of core koala habitat within the meaning of SEPP 44 for koala-habitat protection, though DLWC never provided any data or methodology to allow the identification of core Koala habitat to occur.

The Regional Vegetation Management Plan process was abandoned, along with numerous draft plans, with the Native Vegetation Act 2003. Years of voluntary work by the RVMCs was thrown out.

On 25 July 2006, the Department of Natural Resources released for public exhibition a draft Code of Practice for Private Native Forestry. Following over 1500 submissions and extensive criticism from both conservationists and loggers the Minister intervened by withdrawing the draft and referring it to his Natural Resource Advisory Council with instructions to prepare a new code.

1 (b) (ii) 2. The PNF Code of Practice

The Private Native Forestry Code was introduced by the NSW Government in August 2007 and sets the minimum operating standards for harvesting in private native forests. These were made as a Regulation under the Native Vegetation Act 2003, with four Codes of Practice for separate geographic regions. Under the Code, broadscale clearing for the purpose of private native forestry is taken to be “sustainable” and “improve or maintain” environmental outcomes (even when it causes extensive environmental degradation) if:

- it complies with the requirements of the PNF Code, and
- any area cleared in accordance with the Code is allowed to regenerate and is not subsequently cleared.

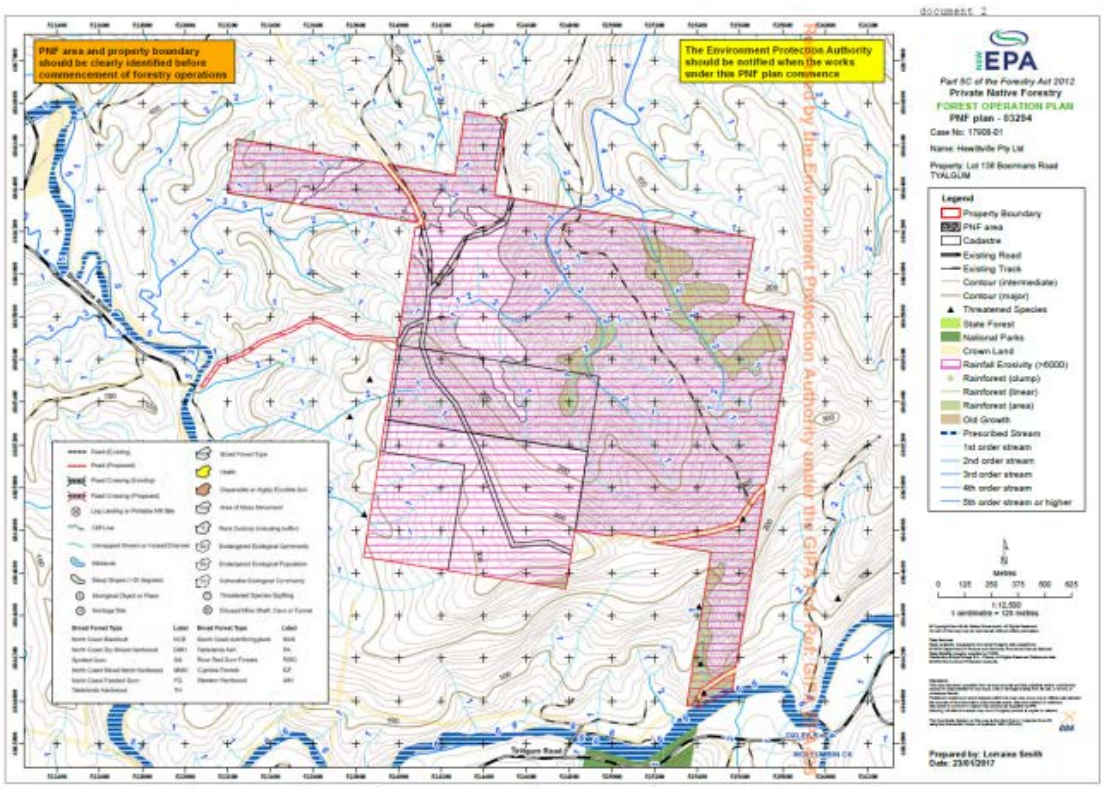
The regulation came into effect on 1st August 2007. The announcement included $30 million restructuring funds for the timber industry. These were only meant to be an interim measure while the Government developed a new Act to regulate private native forestry over the next few years.

In 2007 the NSW Government finally gazetted a set of weakened mandatory rules to control logging on private land in The regulation came into effect on 1st August 2007. The announcement included $30 million restructuring funds for the timber industry. These were only meant to be an interim measure while the Government developed a new Act to regulate private native forestry over the next few years.

The Regulation requires that all logging operations on private land require a Property Vegetation Plan (PVP) or a development consent that complies with the Codes of Practice. A PVP could be approved for up to 15 years.

The Department of Environment and Climate Change was put in charge of the implementation of the Code of Practice. At the time NEFA were concerned that most of the important duties under the Code were given to ex-Department of Natural Resources staff within DECC who had a long history of promoting logging industry interests and being antagonistic towards conservation outcomes. These same staff and attitudes were later transferred to the EPA, and their roles in remapping oldgrowth for logging, remapping endangered rainforest for roading, identifying core Koala habitat for logging, and turning a blind eye while a road was pushed through exclusions areas for Koalas and threatened plants later confirmed NEFA's concerns that it remains a captured bureaucracy. Given the secrecy that surrounds this unit, we can only guess at the magnitude of their crimes,

Under the Native Vegetation Act 2003, harvesting and associated forestry operations conducted for the purposes of PNF require an approved PNF Property Vegetation Plan (PNF PVP). PNF operations under a PNF PVP must be conducted in accordance with the PNF Code of Practice (the Code). The Code has been granted biodiversity certification under the Threatened Species Conservation Act 1995 (TSC Act). This means that once a PVP has been approved, landholders do not need to separately apply for a licence under the TSC Act.



Forest Operation Plan (obtained under GI(PA) request) for a property at Tyalgum. Note that the only identified features are mapped rainforest and stream orders. It is a token plan.

The PVP process is just a simplistic desk-top approval that does little to redress environmental constraints. Those observed by NEFA simply show CRA mapped rainforest and oldgrowth (except where it has been remapped by OEH) and stream orders. There is no environmental assessment or surveys for threatened species. They do nothing to identify potential Koala habitat. They are token assessments.

The PNF Code of Practice is the regulatory mechanism. There is nothing in the EPA's guidelines relating to Private Native Forestry that require surveys for any threatened species. Rather the species-specific protections identified in the code only apply to a 'known record' on Wildlife Atlas or 'site evidence' where a landowner may incidentally come across evidence of a threatened species.

For koalas, the specific provisions for the PNF Code of Practice are:

(a) Forest operations are not permitted within any area identified as 'core koala habitat' within the meaning of State Environmental Planning Policy No. 44 – Koala Habitat Protection

(b) Any tree containing a koala, or any tree beneath which 20 or more koala faecal pellets (scats) are found (or one or more koala faecal pellets in Koala Management Area 5) must be retained, and an exclusion zone of 20 metres (50 metres in Koala Management Area 5) must be implemented around each retained tree.

(c) Where there is a record of a koala within an area of forest operations or within 500 metres of an area of forest operations or a koala faecal pellet (scat) is found beneath the canopy of any primary or secondary koala food tree (see Table I below), the following must apply:

(i) A minimum of 10 primary koala food trees and 5 secondary koala food trees must be retained per hectare of net harvesting area (not including other exclusion or buffer zones), where available.

(ii) These trees should preferably be spread evenly across the net harvesting area, have leafy, broad crowns and be in a range of size classes with a minimum of 30 centimetres diameter at breast height over bark.

(iii) Damage to retained trees must be minimised by directional felling techniques.

(iv) Post-harvest burns must minimise damage to the trunks and foliage of retained trees.

Clause (a) is next to useless as of the five Comprehensive Koala Plans of Management approved over the past 24 years, the Coffs Harbour and Ballina CKPoMs are the only ones to identify core Koala habitat across an LGA and the Kempsey CKPoM only identifies two very small areas (see '1 (c) 1. Comprehensive Koala Plans of Management' for details).

In 2011 the North Coast Environment Council identified that from 2007-2010 the Private Native Forestry (PNF) Division of the NSW Department of Environment, Climate Change and Water (DECCW) had approved 60 separate logging applications covering almost 2000 hectares of the 19,000 ha identified core koala habitat in the Coffs Harbour CKPoM contrary to SEPP 44 (see 2.3.3. Council Case Study 3: Coffs Harbour CKPoM core Koala habitat). It is probable that before then logging was being undertaken in core Koala habitat using the PNF exemption

Clauses (b) and (c), like all species specific provisions in the PNF Code of Practice, are triggered by either the existence of koala records in the Atlas of NSW Wildlife or the identification of the

presence of koalas (or evidence of their presence) by the landholder and/or a logging operator. There are very few records in the Atlas of NSW Wildlife for private lands.

There is nothing in the EPA's guidelines relating to Private Native Forestry that require surveys for any threatened species. Rather the species-specific protections identified in the code only apply to a 'known record' on Wildlife Atlas or 'site evidence' where a landowner may incidentally come across evidence of a threatened species.

Most PNF logging operations are undertaken in areas where there have been no surveys for threatened species and thus there are no "known" records. Therefore the reliance is on incidental "site evidence" which is unlikely to be accidentally found for most threatened species, and even where evidence (such as quoll or Koala scats) may be found and identified by an experienced person, the landowner or contractor have a clear financial incentive not to admit to it. This means that while the PNF code has many potentially useful prescriptions for threatened species they are practically useless.

The callous disregard of the Government agencies for Koalas is exemplified by the fact that it was NPWS (later incorporated into DECCW) who in 1999 identified core Koala habitat in the Coffs LGA in accordance with SEPP 44, then it was DECCW that in 2007 finalised the PNF Code of Practice that specifically excluded core koala habitat from logging, and it was DECCW that in 2007 began systematically approving logging of core Koala habitat in the Coffs Harbour LGA in contravention of the PNF Code, with 2,000 of the 19,000 ha of identified core Koala habitat approved for PNF by 2010.

It is clear that the Recovery Plan's objective to *Conserve koalas in their existing habitat* by identifying and protecting 'core Koala habitat' in accordance with SEPP 44 and LEP zoning has been a failure (see 1 (c) 1).

NEFA's limited experience with PNF operations, and the frequent complaints we receive, prove to us that there is little oversight of operations and minimal protection applied for Koalas.

NEFA (Pugh 2014) became involved with logging by the Forestry Corporation of a private property at Whian Whian (adjacent to the Nightcap National Park) when neighbours tried to have their concerns regarding Koalas addressed (see 2.2.1. Private Case Study 1: Whian Whian private forestry). Discussions with Forestry Corporation on 14 September 2013 revealed that they had found two Koala High Use Trees on the property and were thus applying the Private Native Forestry Code of Practice requirement to retain 10 primary koala food trees and 5 secondary koala food trees per hectare.

Concerns that this property is of exceptional value for Koalas and that Koala's were not being adequately protected were heightened when a brief assessment by NEFA of trees in the vicinity of the boundary located 5 Koala high use trees, none of which had apparently previously been searched. One of the Koala high use trees found had not been previously searched despite having a new road constructed right next to its base.

When NEFA (Pugh 2014) learned that the Forestry Corporation were proposing to construct a new road we surveyed the marked route and identified that it passed through, and within 20m of, 8 Koala high use trees (>20 scats), over 60 vulnerable Red Bopple Nut *Hicksbeachia pinnatifolia,* and 3 NSW Endangered Clear Milkvine *Marsdenia longiloba.* NEFA wrote to the EPA on the 22

September 2013 to request the immediate and urgent imposition of a Stop Work Order in accordance with Section 37 of the Native Vegetation Act 2003.

The EPA sent a team in to oversee the Forestry Corporation, though refused to stop work. They EPA did not bother to check NEFA's records, yet spent 2 days wandering around the proposed route with the Forestry Corporation while they identified a new route.

Three days after our request for a Stop Work Order the new track was constructed. Subsequent inspections by NEFA (with botanists) found that the track had been illegally constructed through what should have been 20m exclusion zones for 3 Koala high use trees, 7 NSW Endangered Clear Milkvine, 12 vulnerable Arrow-head Vines, and 8 vulnerable Red Bopple Nuts, most of which had been identified and tagged with pink tape (by either NEFA or the Forestry Corporation) prior to track construction. One of the Koala high use trees that had been identified by the Forestry Corporation in the presence of the EPA had the track constructed within 15m and debris within 12m without its exclusion boundary being marked, one 3.2m from the track had been checked by the Forestry Corporation in the presence of the EPA but had not been identified despite subsequent inspections showing abundant scats, and one had been identified by NEFA but could not be subsequently verified due to scats being removed. Two Clear Milkvine were killed, one injured and 3 are missing. One Arrow-head Vine later died.

Over the course of events NEFA (Pugh 2014) found and reported a total of 16 Koala high use trees with 20 or more Koala scats beneath them. The Community Surveys of the weekend of 27-29 September found an additional 10 Koala high use trees with limited searching, bringing the total to 26 such trees in an area where the Forestry Corporation had only identified 2. A total of 8 Koala high use trees (and numerous threatened plants) were found to have had roads and tracks constructed within 20m of them.

This large number of high use trees proves that there is an active breeding Koala colony on the property, with evidence of males, females and young, that largely escaped the attention of the Forestry Corporation. There can be no doubt that the property constituted high quality core Koala Habitat but the EPA didn't care.

There was a 2 year window of opportunity for the EPA to legally pursue this matter, and they used most of this time up before they issued the Forestry Corporation with two Penalty Notices (each with a fine of $5,500) on the 11 September 2015 for constructing their track through what should have been 20m exclusion zones for a Koala High Use Tree and the Endangered vine Clear Milkvine.

They were issued an Official Caution for violating buffers of 4 Red Bopple Nuts, with violations of 6 Arrow-head Vine buffers noted. This is half the breaches documented by NEFA.

The Forestry Corporation stated they intended to vigorously dispute the fines on the grounds that their intent *"was discussed with EPA staff on site during the operation".* In other words, the EPA knew they were going to construct the illegal road and, at best, did nothing to stop them.

Given that the EPA had almost used up their 2 years for legal action, the Forestry Corporation simply bided their time before telling the EPA that they would not pay the fines and would rather dispute them in court. By then, the EPA claim, it was too late to defend the fines in court. Given the EPA's complicity in the construction of the illegal road it is no wonder they waited so long to take action so that they could avoid court.

Following complaints from locals NEFA (2017) decided to undertake an initial assessment on 9th September 2017 of a private property at Tyalgum near Mount Warning from the Crown Road Reserve that runs through it (see 2.2.1. Private Case Study 2: Tyalgum private forestry). No threatened species had previously been identified on the property. From our brief inspection NEFA identified 2 Koala High Use Trees (one of which had a road constructed up to its base) and detected the presence of two Marbled Frogmouths and one Masked Owl. We also identified a systematic failure to implement erosion mitigation prescriptions and illegal logging in an Environmental Zone,

The EPA confirmed the presence of the Koala High Use Trees, though refused to require Koala surveys elsewhere on the property to identify additional Koala High Use Trees for the implementation of the required 20m buffers..

Though, as with all prescriptions for threatened species, the fundamental question is whether the prescription is effective in reducing logging impacts to an insignificant level, or even whether it has any beneficial effects. As with public lands, the NPWS, DLWC and EPA have been applying prescriptions for threatened species in a haphazard way since the inception of the Endangered Fauna (Interim Protection) Act 1991 on the premise that the prescriptions would avoid "a significant effect". Though, as far as we are aware, there has never been any attempt to assess the effectiveness of prescriptions - the agencies just don't care.

Regrettably it is clear that both the Conservation and Management Strategy and NSW Recovery Plan requirements relating to identifying and protecting important habitat areas, identifying improved and standardised survey methods, and monitoring and reviewing the effectiveness of mitigation measures, are not being complied with on private lands

One of the biggest problems NEFA encountered with private land logging at Whian Whian (Pugh 2014) was the total secrecy involved. Legally we were not allowed to trespass on private property once we were asked to leave, which created dilemmas when we knew there were likely to be Koala High Use Trees and threatened plants along the route of a road that the Forestry Corporation were intending to bulldoze the next day, and the EPA had made it clear they were going to do nothing to stop them. Our survey found 8 Koala High Use Trees, over 60 vulnerable plants and 3 endangered plants on the route.

The curtain of secrecy surrounding PNF is intended to hide what is going on from public view. While it is recognised that there needs to be a degree of confidentiality, the lack of any independent scrutiny has enabled the EPA to become a captured agency and encouraged bad practices.

From his review of forestry self-regulation in Tasmania, Prest (2003) considered that it contained insufficient safeguards and "*insufficient measures to counteract the strong incentives to under-report threatened species matters*", noting that when combined with secrecy provisions:

> *the system of self-regulation can create an environment in which external review, evaluation and critique are unwelcome. In such a context, conditions are created in which it is possible, or even expected, for participants to turn a blind eye to breaches of the Act and Code.*

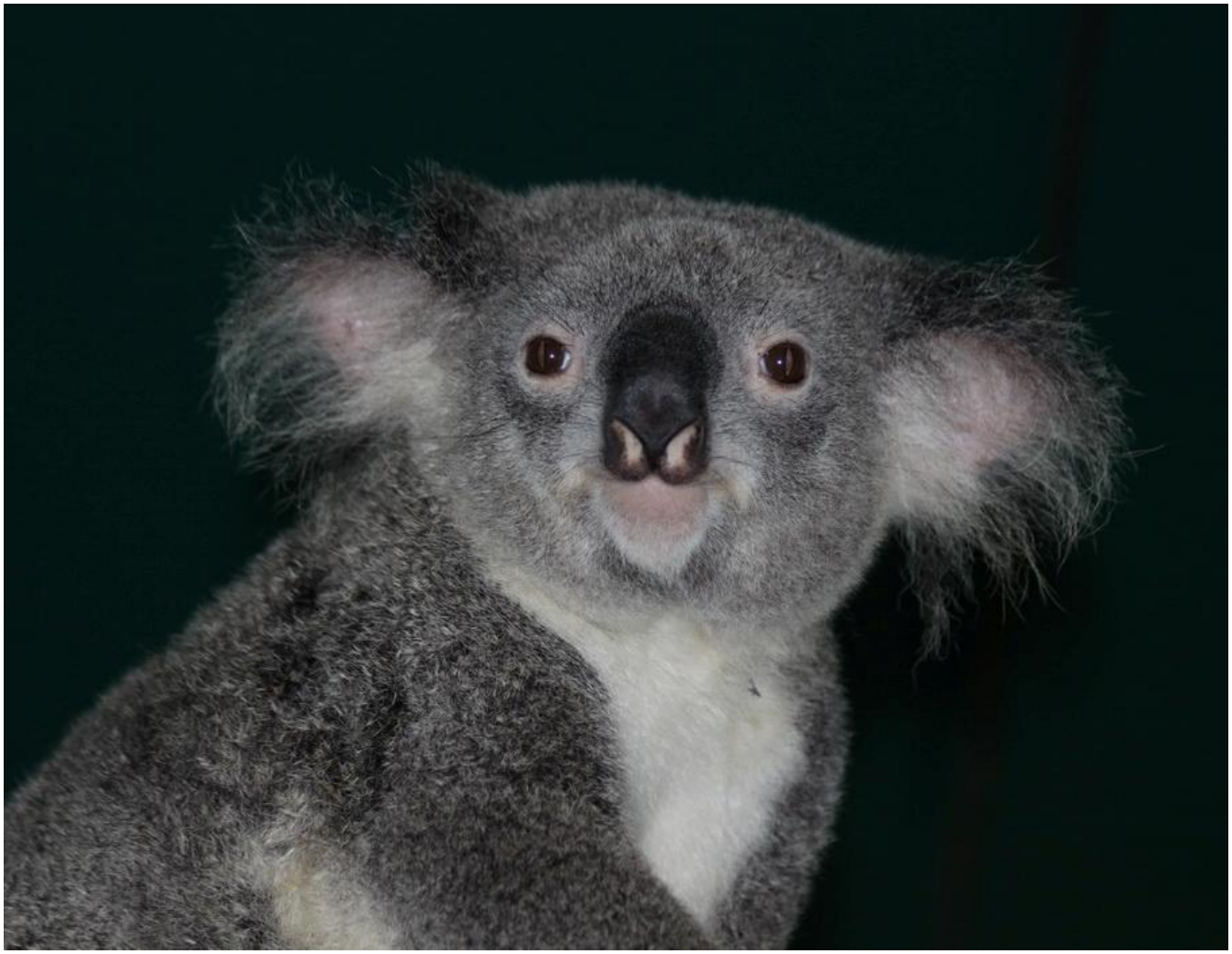
While we supposedly have an independent regulator in NSW, this seems to sum up the situation in NSW. Prest (2003) identifies that there is a danger when the regulator identifies those they are meant to regulate as their "customer" or "client". Our experience at Whian Whian was that the EPA perceived their role being to facilitate the Forestry Corporation's activities (regardless of the consequences) while regarding the locals who were complaining as the problem. Prest (2003) suggests that "*the institutional solution is to separate roles and responsibilities between the*

regulator and the service provider, by creating an Office of the Forest Regulator separate to extension services".

Prest (2003) also identifies that that "'*soft' techniques for behaviour change, although vital, must take place within a context of the threat of coercive action to ensure compliance. Threats and inducements must be perceived as real, not a mere bluff*". The EPA appear unwilling to regulate private forestry, they are a captured agency.

It is considered that as well as effective regulation there needs to be incentives in the form of stewardship payments to protect core Koala habitat on private property. To improve regulation of PNF in NSW, Prest (2003) makes a number of recommendations, including:

> *offering financial incentives and other inducements for biodiversity conservation and for positive land-management actions to private landholders, in order to overcome existing countervailing incentives to destroy biodiversity.*



1 (b) (iii) the impacts on koalas and koala habitat from the old growth forest remapping and rezoning program

The National Forest Policy (1992) required that "*relevant State agencies will, as a matter of high priority, undertake assessments of forests for conservation values, including old-growth values*" and that a " *comprehensive, adequate and representative reservation system to protect old-growth forest and wilderness values will be in place by the end of 1995*". The NFPS defines old-growth forest as:

> *Forest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, roading and clearing. The definition focuses on forest in which the upper stratum or overstorey is in the late mature to over mature growth phases.*

The national forest reserve criteria (JANIS 1997) adopt the operational definition:

> *Old-growth forest is ecologically mature forest where the effects of disturbances are now negligible.*
>
> *In applying this interpretation to a forest ecosystem within a region, the following principles will apply:*
>
> - *Ecological maturity is defined by the characteristics of the older growth stages*
> - *If data are available on the structural, floristic, and functional qualities that would be expected to characterise an ecologically mature forest ecosystem, these data should be used in the assessment of the significance of disturbance effects.*
> - *Negligible disturbance effects will be evident in most forests by a significant proportion of trees with age - related features and a species composition characteristic of the ecologically mature forest ecosystem.*

After decades of debate over how to define oldgrowth and rainforest they were mapped by Aerial Photographic Interpretation across all land tenures in the Comprehensive Regional Assessment (CRA) under the supervision of an expert panel and a committee comprising the principal agencies and non-government interest groups.

The mapping rules were developed specifically to apply to the 1:25,000 photos available at that time. Broadly, forest stands with more than 30% of the tree crowns identified as senescing (dead branches visible) and less than 30% as regrowth were classed as senescing. For forest types dominated by species that do not display obvious senescence as they age no threshold for senescence was applied.

On public lands only High Conservation Value oldgrowth forest was protected, with other oldgrowth remaining available for logging. The protected HCV oldgrowth was zoned for protection and given legislative protection as Special Management Zones under the Forestry Act. It was counted as part of the national Comprehensive, Adequate and Representative reserve system.

Under DECCW's Old Growth and Rainforest Private Native Forestry assessment protocols a private landowner can a request a review of oldgrowth and rainforest as mapped in the CRA. on private land. While the private land remapping is primarily a secretive process, NEFA's experiences with it give us no faith that it is being undertaken in a professional or objective manner by the Office of Environment and Heritage (OEH) (see below).

Though the principal problem is that OEH have changed the criteria and methodology for mapping oldgrowth. They do not account for tree species that do not develop senescent crowns (meaning species that do not generally develop dead branches in the crowns - such as Brush Box), reduce the regrowth threshold from less than 30% to less than 10% (automatically deleting extensive areas of oldgrowth), use higher resolution imagery that increases the visibility of regrowth (and therefore its percentage), and undertake dubious disturbance assessments.

It is outrageous that oldgrowth mapping criteria based on the percentages of regrowth, mature and senescent tree crowns visible on 1:25,000 wet film photographs are now applied to high-resolution ADS40 imagery where more regrowth trees in the understorey are now visible. It is even more disturbing that the agencies did not recognise the need to develop new criteria for the new imagery.

NEFA were dismayed when we found out in 2018 that contrary to numerous assurances from the EPA and Ministers, the Government was intending on remapping oldgrowth for logging using the discredited private property process. This was only being considered by the Government because the Natural Resources Commission (NRC 2016) claimed a timber shortfall of up to 8,600 cubic metres per annum over the next 100 years. We soon realised that they had only identified the shortfall by excluding plantation hardwoods from their calculations, and that with plantations included there is actually a growing surplus.

Not only are the NRC intending to apply the new mapping criteria and methodology, they have changed the CRA oldgrowth targets to make more HCV oldgrowth forests potentially available for logging. They amalgamated regions, removed the 100% target for rare and depleted oldgrowth, added some unknown categories of private lands as reserves and amalgamated forest types to increase the area of oldgrowth claimed to have met targets by 42%.

By applying the new criteria and methodology, as well as dubious disturbance assessments, the NRC (2018) remapped 88% of HCV oldgrowth out of existence in their trials. They also applied the new private property rainforest mapping criteria to remove 62% of mapped rainforest.

The outcome of these multiple attacks is that of the 103,000 ha of HCV oldgrowth in Informal Reserves on State forests, up to 58,600ha (57%) may be opened up for logging using the NRC's targets, criteria and methodology. Of the 81,567ha of mapped rainforest up to 50,571 hectares could be opened up for logging. The EPA assessed that with application of various exclusions 21,170ha would potentially available for logging, of which 14,700 ha (70%) was likely to be actually logged. They assumed this would meet their timber requirements for 20 years, so after then they would need to log more to meet their 100 year targets.

The rationale for needing to log oldgrowth are the impacts on available sawlogs from timber supplies due to protections for Endangered Ecological Communities and Koalas. EECs were already protected (and presumably accounted for). Under the new Koala prescription the area of State Forests for which 10 trees/ha >20 cm dbh will need to be retained is just 36,152ha (out of almost a million ha) and the area where 5/ha will need to be retained is 212,073 ha. With requirements for 5/ha Koala feed trees in intermediate use habitat already triggered on around 33 percent of compartments (NRC 2016), and no need to protect Koala High Use Areas, it is hard to fathom how the revised Koala prescription can be considered to have any increased impact.

Irrespective of definitions and thresholds, those stands mapped as oldgrowth are the most intact stands remaining on State Forests as they are dominated by old and mature trees and have not been logged for at least 20 years (if ever). They provide refuges in a sea of regrowth and essential

stepping stones linking National Parks. The larger mature and senescent trees are preferred by Koalas (see 1 (a) 3. Loss of Large Trees) and the loss of these important resources will have a significant impact on any Koalas present.

Of the 29,464 ha of "commercial" oldgrowth identified as potentially available for logging some 10,306 ha (35%) is identified as medium to high quality Koala habitat, which indicates that around a third of the oldgrowth proposed for logging is likely to be medium to high quality Koala habitat. Due to the limitations of the model, and the fact that it doesn't accurately identify the location of occupied high quality habitat, it is essential to consider that impacts will depend on how much occupied habitat is affected.

The impacts are expected to be far more significant than indicated by their aerial extent as the patches of remaining oldgrowth are likely to be keystones in supporting populations partially using logging areas. For example in their Koala study Law et. al. (2017) consider:

> *Resilience of koalas to recent, heavy harvesting is most likely explained by the landscape mosaic of forest types and disturbance history in north-east NSW; especially the level of harvest exclusion in the landscape. Over the last 20 years exclusions averaged ~ 40% of the State forest area in the region [7]. In our study, about 50% of the 1 km area surrounding our recent, heavy harvest sites received this treatment in the last 10 years. The remainder comprised temporary off-set zones, but also permanent riparian buffers, old growth and rainforest exclusion areas and habitat protection for owls. In addition, large trees (40–80 cm dbh) provide important shelter and browse for koalas [31, 32]. Within the harvest area, scattered habitat trees, recruit/seed trees and feed trees for other species assist in providing a scattered uneven age structure, even where harvesting is heavy [7].*
>
> *...*
>
> *Koala high-use areas supported nearly three times the bellow rate (3.1 bellows night^{-1}) as other treatments*

The impacts on Koalas from these changes to the Coastal IFOA will be greatly amplified by the Coastal IFOA's reduction in buffers to headwater streams from 10m down to 5m, the almost doubling of allowable logging intensity, and the removal of the need to protect recruitment habitat trees (mature trees required as future hollow-bearing trees). On its own the removal of protection for 3-5/ha mature eucalypt feed trees will result in the loss of some 2-2.5 million mature trees in north-east NSW. NEFA estimates that protection will be removed from some 22,000 ha of riparian buffers north from the Hunter River. The loss of many exclusion areas required for other species utilising eucalypt forests will compound impacts, such as the loss of the 20ha exclusion areas around records of Brush-tailed Phascogale and 8ha around Squirrel Gliders. The loss of vital riparian refuges, other exclusions and most mature trees will significantly compound impacts on Koalas.

Irrespective of definitions and thresholds, those stands mapped as oldgrowth are the most intact stands remaining on State Forests as they are dominated by old and mature trees and have not been logged for at least 20 years (if ever). The loss of these key refugia, combined with the loss of Koala High Use Areas and the other significant reductions in habitat retention in the new Coastal IFOA are expected to have significant impacts on Koalas in the forests affected.

Having agreed to these areas being protected, out of greed the logging industry wants them back. According to the Forestry Corporation's own data there is no resource shortfall and no justification for removing these forests from the already inadequate reserve system for

logging. The NSW Government should immediately rule out this assault on north east NSW's oldgrowth, rainforest and CAR reserve system.

1 (b) (iii) 1. Remapping of oldgrowth on Private Forests

Under DECCW's Old Growth and Rainforest Private Native Forestry assessment protocols a private landowner can a request a review of oldgrowth and rainforest as mapped in the CRA. on private land, where landholder initiated reassessments of mapped as old growth forest in 667 cases resulting in a 65 percent reduction in the area of mapped old growth forest (from 45,000 hectares down to 16,000 hectares), and a 23 percent reduction in the mapped area of rainforest (from 18,000 hectares to 14,000 hectares). (NRC 2018).

A 2010 internal review of DECCW's (now OEH) methodology for remapping oldgrowth forest found it was fundamentally flawed and that a significant amount of the mapped oldgrowth was being wrongly deleted. Webster (2010) found that *"the protocol implementation is working very well for rainforest"*, but that implementation for *"old-growth is highly variable and problematic and has apparently resulted in some areas of old-growth being potentially available for harvest"* . Transect assessments resulted in PNF old-growth classification in 4 out of 5 areas that were not correctly identified by DECCW assessments as being old-growth, 80% of the time OEH were getting it wrong.

NEFA considered that by then over 8 thousand hectares of mapped oldgrowth forest were likely to have been remapped as not being oldgrowth, and had thus been made available for logging, in numerous 15 year Property Vegetation Management Plans. The reviewer hoped that improved imagery and hardware, combined with fieldwork, and regular peer review would increase the accuracy and reliability of DECCWs remapping.

Though aside from their failure to accurately apply their methodology, the more fundamental problem was that they had tightened the decision rules for mapping oldgrowth (i.e. reducing the regrowth threshold from less than 30% to less than 10%) and were applying rules developed for 1:25,000 aerial photographs to higher resolution imagery. The high-resolution ADS40 imagery now being used allows for greater visibility of under-canopy trees, and thus far more regrowth trees are visible than is the case with 1:25,000 aerial photos. It is plainly wrong to use decision rules developed for 1:25,000 aerial photos for very different imagery that allows a higher proportion of regrowth to be viewed. New mapping rules need to be developed specifically for ADS40 imagery that allows for a higher threshold for regrowth.

On behalf of NCC, John Edwards and myself attended an EPA workshop on oldgrowth delineation in the Private Native Forestry PVP process on 22 November 2012. It was aimed at showcasing how OEH had improved their oldgrowth field assessments, though it revealed a fundamentally flawed field assessment process that was strongly criticised by all stakeholders, as well as ongoing mapping problems. OEH had still not rectified the manifest deficiencies in their remapping.

It was alarming that OEH's Science Division (SD) were refusing to map oldgrowth of species not displaying senescent characteristics typical of Blackbutt. I reported to the EPA (Pugh 2012):

> *Growth-staging is based on the typical growth stages of Blackbutt and the presence of dead branches and uneven crowns in senescent trees. These are what are used to define oldgrowth trees and thus oldgrowth forests. These characteristics are shown to varying degrees by eucalypts, but not by non-eucalypts such as Brush Box, Turpentine and some Angophoras. This has been identified as a key issue for over 20 years in the north-east*

forests. Despite this, SD still had no decision rules for identifying oldgrowth stands of these forest types. ...

...

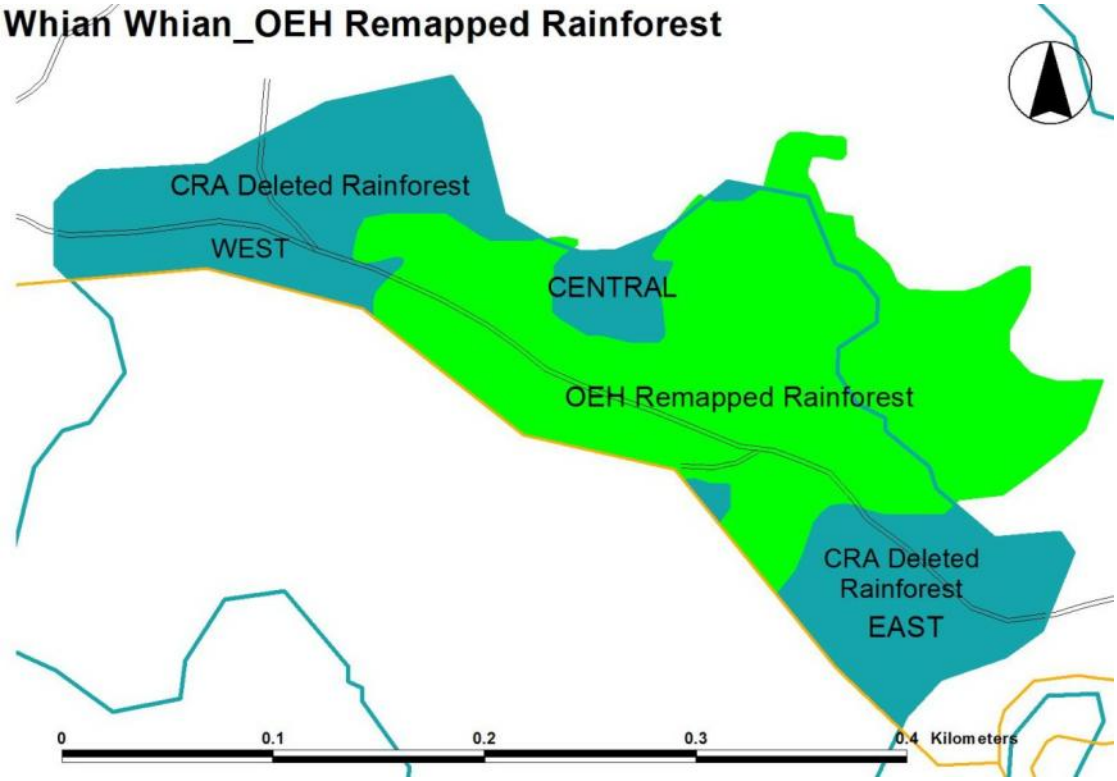
Given that SD have no decision for forest types showing atypical growth forms there are real concerns that significant stands of oldgrowth forests, particularly those dominated by Brush Box and Turpentine, are being missed. It was recommended that decision rules to delineate the oldgrowth stage for these species be developed urgently.

It is reprehensible that the current rules still do not allow for species not displaying obvious signs of senescence in their canopies. This was the reason that the CRA adopted different API decision rules for different interpretability classes (which OEH seem not to understand). The refusal to rectify the decision rules all these years later displays a high level of antipathy towards protecting oldgrowth forest.

On the field inspection it was also concerning that "*The selection of field transects and plots for verification is extremely problematic as they are chosen subjectively and in at least one case (if not both) plots were located outside the mapped polygon. The assessment of significant disturbance appeared to have been wrongly assessed on one of the three plots inspected within mapped oldgrowth and another was dubious. Based on the small sample reviewed it is not considered that field verification is undertaken in a rigorous or objective manner*".

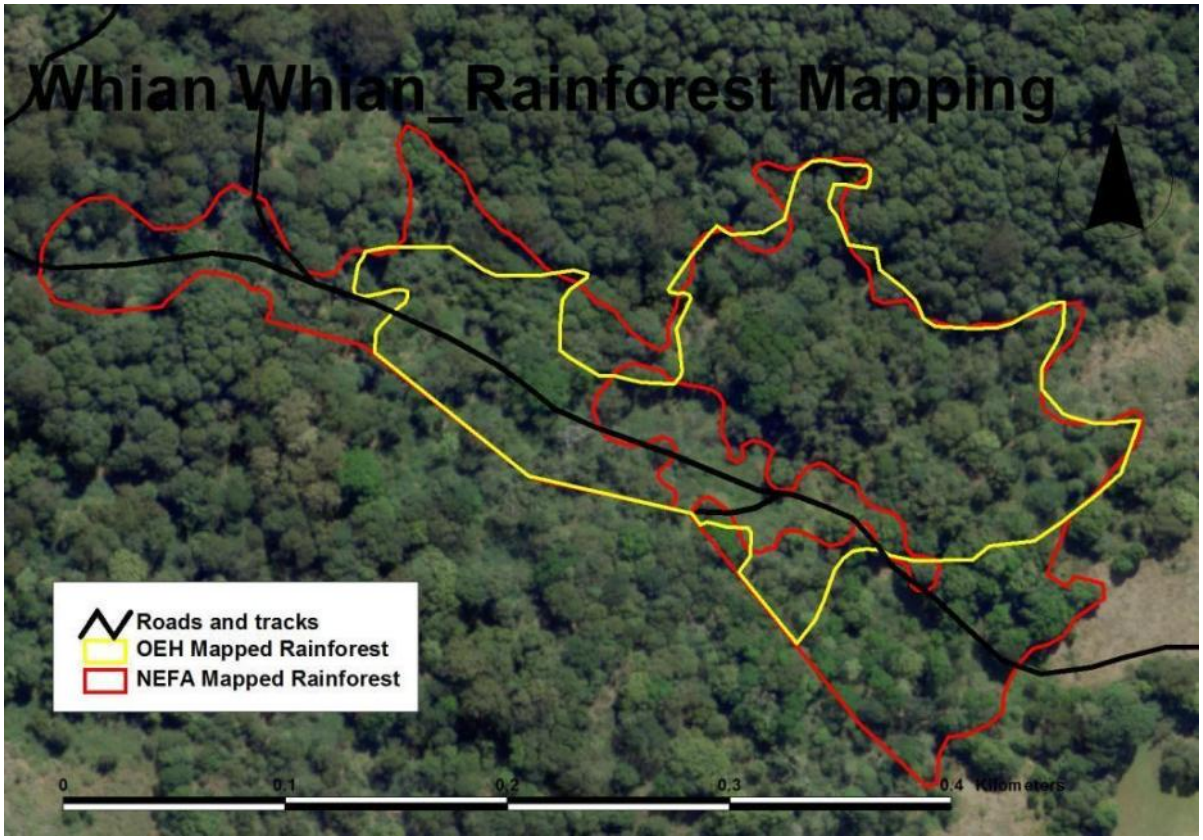
NEFA's concerns about the remapping process were heightened when we found the that OEH had remapped obvious Critically Endangered Lowland Rainforest of Subtropical Australia under the *Environment Protection and Biodiversity Conservation Act 1999* as either cleared land or part of the logging area at Whian Whian in 2013 (Pugh 2014). This proved that OEH had still not rectified the manifest deficiencies in their remapping, and that to the contrary, even with state of the art imagery and equipment there was something very wrong.

In May 2012 as part of the preparation of the PVP, the OEH, at the request of the EPA and Forestry Corporation, reviewed the rainforest mapping. In this process they redrew the rainforest boundary. The 4.9 hectares of rainforest mapped on the property in the stand along the road, was remapped as 3.3ha by OEH, with 2.5 ha deleted and 0.9ha added by an extension of the boundary to the north. The deleted rainforest was reassigned either to the loggable area or as cleared land. The FC constructed the main access road through this stand of rainforest for 520m, with this reducing to 250m with the remapping. It appeared that the rainforest had been deleted to facilitate the roading.



MAP: OEH remapping of the CRA mapped rainforest resulted in the deletion of a western, central and eastern patches. Note that most of the stand occurs on the adjacent property (outlined in blue).

In deleting these rainforest patches the Government agencies removed all protection from them and their inhabitants, reallocating the western and central stands for logging and the eastern stand as cleared land.



Mapping by OEH and NEFA overlaid on aerial photo, note the south eastern patch classed as "cleared" by OEH and the central lantana dominated area classed as non-rainforest by NEFA.

Examples of Lowland Subtropical rainforest remapped by OEH as either cleared land (right) or assigned to the logging area (left).

NEFA engaged an API expert and botanist to remap the rainforest in the vicinity of the access road using Aerial Photographic Interpretation (API). This was done by applying the definition in the PNF Code and the methodology specified in the "Identification of Rainforest, Field Guide" (NRM Field Assessment Guidelines: Rainforest Identification). In accordance with the Field Guide NEFA undertook transects to determine crown separation ratio using two "zig zag transects" (Field Guide 3.2). From this process, floristic assessments, and consideration of the criteria, it was clear the deleted rainforest qualified as both the Endangered Ecological Community (EEC) Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion under the NSW Threatened Species Conservation Act, and the Critically Endangered Lowland Rainforest of Subtropical Australia under the *Environment Protection and Biodiversity Conservation Act 1999*.

Despite the comprehensive and detailed evidence we presented (Pugh 2014) the EPA flatly refused to investigate our complaint and when we submitted a freedom of information request (GI(PA) Act) both the EPA and OEH refused to provide any documents on their remapping on the grounds that there was "*a public interest consideration against disclosure of information*" because the remapping of public data by a public agency was "*personal information*" and its release may cause harm to a person. This was remapping of rainforest that had been identified in a public process (the CRA) and was now being remapped out of existence.

1 (b) (iii) 2. Remapping of oldgrowth on State Forests

After decades of debate over how to define oldgrowth and rainforest they were mapped by Aerial Photographic Interpretation in the Comprehensive Regional Assessment (CRA) under the supervision of an expert panel and a committee comprising the principal agencies and non-government interest groups.

Broadly, forest stands with more than 30% of the tree crowns identified as senescing (dead branches visible) and less than 30% as regrowth were classed as senescing. For forest types dominated by species that do not display obvious senescence as they age no threshold for senescence was applied.

Disturbance indicators (tracks, canopy gaps, weeds, dieback, log dumps etc) and logging history were then combined with the senescing growth stages to identify negligibly disturbed forests that qualified as candidate old-growth forest.

Oldgrowth forest identified as core habitat for 21 threatened species for which oldgrowth provides optimal habitat and/or making a significant contribution to the full suite of reserve targets (high 'summed irreplaceability') was deemed High Conservation Value (HCV) oldgrowth forest.

As an outcome of the 1998 IFOA and 2000 RFA stands of HCV oldgrowth over 10ha but too small or fragmented to be included in new national parks, along with most patches of rainforest over 2ha, were included in Special Management Zones (SMZs) protected under the Forestry Act. They were identified as Informal Reserves and part of the Comprehensive Adequate and Representative (CAR) reserve system. They were counted as contributing towards all national reserve targets (ie oldgrowth, forest ecosystem, national estate, fauna, flora) and, because of the timber constraints applied, their protection was at the expense of additional formal reserves. Mapped HCV oldgrowth forests in the Upper North East are also legally protected as a heritage item under the NSW Heritage Act 1977.

FCNSW were left with 57,000 ha of mapped oldgrowth forest to log.

Along with 42,500ha of new reserves, some 22,000ha of oldgrowth (identified by NEFA as remaining unlogged at that time) were protected by inclusion in SMZs in the 2003 Icon Decision, in return for industry being given access to buffers around exclusion areas (which Forestry claimed more than compensated for the new reserves) and new 20 year Wood Supply Agreements (WSAs).

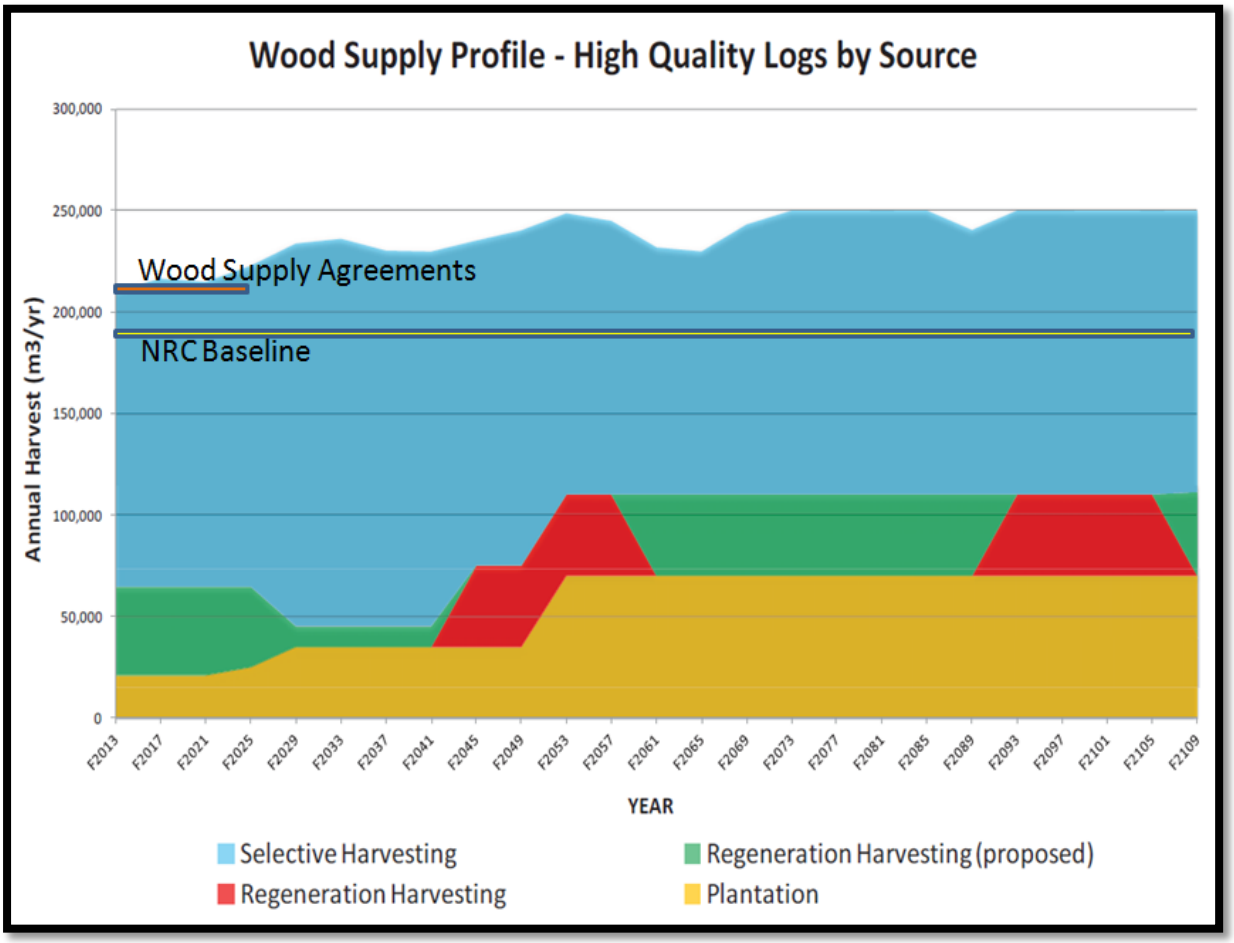
A key commitment of the NSW Government has been that the new Integrated Forestry Operations Approval (IFOA), will result in "*no net change to wood supply and no erosion of environmental values".* There were numerous reductions in environmental constraints that were agreed between the agencies, or imposed by the Natural Resources Commission (NRC) at the behest of the Forestry Corporation, in negotiating the new IFOA on the basis of the need to maintain current timber yields for the next 100 years.

Even then the NRC (2016) claimed that "*it is not possible to meet the Government's commitments around both environmental values and wood supply",* maintaining there would be a shortfall in commitments from north-east NSW of 7,600 to 8,600 m^3/yr of High Quality Logs (HQL) due to protections for Endangered Ecological Communities and Koalas. To make up this claimed shortfall the Government decided to log oldgrowth forests and rainforest protected in the reserve system.

I was shocked when the NRC informed me that their "*assessment was based on ~180,000 m^3/pa harvest volume (avg over 100 years) supplied from the native forest estate only*", noting:

> *180,000m^3/yr is the average annual HQ supply estimated to be available when modelling native forest growth over a 100 year planning timeframe (from the model where TEC mapped area are excluded from net harvestable area).*

Wood Supply Agreement (WSA) commitments of HQL are based on yields from both native forests and hardwood plantations. The decision to establish over 10,000 ha of new hardwood plantations as an outcome of the RFA was specifically to increase the supply of HQL in the long-term. It is thus perplexing as to why the NRC excluded them in their assessment. By doing so they turned an identified average yield of 237,000 m^3/yr of HQL over the next 100 years, a surplus of 10,000 - 20,000 m^3/yr (depending on whether small poles are included) above current WSAs, into a claimed potential shortfall in commitments from north-east NSW of 7,600 to 8,600 m^3/yr of HQL. (see section 8 of A Review of North East NSW Timber Predictions and Yields from Public Forests Over the Past 20 Years).



'Figure B: Projected wood supply profile' (from NRC 2016) overlaid with current Wood Supply Agreements of 220,000m^3 (which could include 10,000m^3 of non-HQL small poles) and the 180,000m^3 baseline derived by NRC excluding plantations. Note the increasing availability of plantation timber over time.

With plantations included there is no shortfall in HQL resources and thus no need to log protected HCV oldgrowth. According to Forestry data there is more than enough timber to satisfy current allocations that last until 2023 (the life of most WSAs), even if they are extended indefinitely.

In a shoddy process the NRC changed the CRA oldgrowth targets, as well as the CRA mapping criteria and methodology. They amalgamated regions, removed the 100% target for rare and depleted oldgrowth, added some unknown categories of private lands as reserves and amalgamated forest types to increase the area of oldgrowth claimed to have met targets by 42%.

For mapping they adopted the discredited criteria that are applied to Private Native Forestry (PNF). In the NRC's oldgrowth remapping trials they did not account for tree species that do not develop senescent crowns and reduced the regrowth threshold from less than 30% to less than 10% (automatically removing 13% of oldgrowth), used higher resolution photography that increases the visibility of regrowth (and therefore its percentage), undertook dubious disturbance assessments and thereby remapped 88% of HCV oldgrowth out of existence.

The NRC similarly used a different definition of rainforest than what was applied in the CRA, with NRC noting "*The primary difference is that the PNF definition excludes areas with emergent non-rainforest species that exceed 30 percent of the upper crown cover"* (including brushbox and turpentine). The trial remapping removed 62% of mapped rainforest.

The outcome of these multiple attacks is that of the 103,000 ha of HCV oldgrowth in Informal Reserves on State forests, up to 58,600ha (57%) may be opened up for logging using the NRC's criteria and methodology. Of the 81,567ha of mapped rainforest up to 50,571 hectares could be opened up for logging

The NRC have particularly targeted stands dominated by Brushbox and Turpentine for exclusion from both rainforest and identification as oldgrowth (because oldgrowth trees of these species don't typically display senescence).

NEFA does not accept the NRC's new targets, definitions, mapping criteria or methodologies as being valid or consistent with the national forest reserve criteria (JANIS). NEFA does accept that there may be some minor cases of mapping errors and that there was some logging of stands before they were protected, though this is true for the whole of the reserve system, and NEFA does not accept this as a valid reason for removing such areas from the CAR reserve system.

Irrespective of definitions, NEFA considers those forests mapped as oldgrowth are of immense value as the most intact stands of forests left on State Forests as they:

- are part of the CAR reserve system.
- are dominated by oldgrowth and mature trees.
- have escaped the intensive logging of the past 20 years.
- have been identified as high conservation value for multiple attributes
- provide important habitat attributes and refugia for numerous threatened fauna not provided for by regrowth
- provide essential corridors and stepping stones between national parks.
- are important carbon storehouses

Over 20 years ago there was a process to apply the national forest reserve criteria (JANIS) to identify a CAR reserve system that was based on the best available information at that time. In 1998 the NSW Government Agencies identified (MaxJANIS) that we needed over a million hectares of State Forests and Crown Lands in north-east NSW to be protected to reasonably meet those targets.

We were precluded from meeting the JANIS reserve targets because the timber industry did a deal with the Government to guarantee the timber commitments that then existed for 20 years. This limited the area that was allowed to be included within national parks because of the timber costs. The patches of HCV oldgrowth and rainforest agreed for protection in Informal Reserves were at the expense of Formal Reserves. While the timber industry supported the outcome, NEFA did not because we ended up without a true CAR reserve system and without all oldgrowth forest being protected.

Over 20 years later the forests added to the Formal Reserve system in north east NSW are only half of what was identified by Government Agencies as needed in 1998. The Informal Reserves do not rectify all the reserve system's inadequacies, though they make a significant contribution towards better satisfying many JANIS targets, protecting patches of intact forests, maintaining wildlife populations and improving reserve connectivity.

The NRC maintain that "*remapping and rezoning former old growth areas*" should only proceed "*If there is a verified shortfall in wood supply*". It is verified that there is no shortfall so the NSW Government should immediately rule this out.

Oldgrowth remapped for logging by NRC in Clouds Creek State Forest.

1 (c) the effectiveness of State Environmental Planning Policy 44 - Koala Habitat Protection, the NSW Koala Strategy and the Biodiversity Conservation Act 2016, including the threatened species provisions and associated regulations, in protecting koala habitat and responding to key threats,

Some Local Government Areas have had a long-term role in regulating Private Native Forestry, though this usually involved few constraints (Prest 2003). Perhaps the most significant impact that Local Government has on Koalas is through their zoning, Development Control Plans, and Development Application processes. Though they also affect Koalas through their own land management and infrastructure projects.

This submission focuses on aspects of SEPP 44 and Local Environment Plan zoning. The NSW Koala Recovery Plan (2008) places significant emphasis on protecting Koala habitat on private land through SEPP 44 and Local Environment Plans (i.e. *Actions 1.13, 1.15, 1.19, 1.20*).

State Environmental Planning Policy No. 44 (Koala Habitat Protection) came into effect in 1995 with the aim to "*encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline:*

a) *by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and*
b) *by encouraging the identification of areas of core koala habitat, and*
c) *by encouraging the inclusion of areas of core koala habitat in environment protection zones*".

SEPP 44 identifies two classes of habitat:

> ***"core koala habitat"*** *means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.*
>
> ***"potential koala habitat"*** *means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.*

Under the provisions of SEPP 44 local councils cannot approve development on lands greater than 1ha without an investigation of potential and core koala habitat. To this end SEPP 44 requires councils to address koala conservation through either Individual Koala Plans of Management (IKPoM) for a specific site/development, or Comprehensive Koala Plans of Management (CKPoM) that will apply to part or the whole of a Local Government Area. A site-specific IKPoM must accompany any development application (DA) where core koala habitat is found to occur. However, if a CKPoM has been approved for the area, then individual DAs do not need to include an IKPoM –

as long as the DA is consistent with the requirements of the CKPoM. An applicant may still prepare an IKPoM if they so choose.

SEPP 44 encourages Councils to systematically identify areas of 'core koala habitat, stating that councils "should" conduct koala surveys, and take the results regarding core koala habitat into account when making environmental protection zones and development control plans.

The focus of SEPP44 on core Koala habitat is blatantly obvious and thus the highest priority has to be to identify core Koala habitat. This need was reaffirmed by the Native Vegetation Conservation Act 1997, 27 (2) which required:

> If, in preparing a draft regional vegetation management plan, any part of the land to which the plan is intended to apply is core koala habitat within the meaning of State Environmental Planning Policy No 44—Koala Habitat Protection, the plan must make provision, consistent with any guidelines under that Policy, for appropriate protection and management with respect to that habitat.

The NSW Government did assist Coffs Harbour Council to identify core Koala habitat in their 1999 CKPoM, though subsequently seems to have developed an aversion to core Koala habitat. In all the years up to up until the Ballina CKPoM was adopted only a few hectares of core Koala habitat were identified in CKPoMs, presumably because the requirements to protect it are seen as an impediment to clearing, logging and development. Of the 5 CKPoMs that have been prepared over the past 24 years only 2 identify core Koala habitat. This is a lousy performance.

Even then the identified core Koala habitat was treated with contempt. It was the NPWS and their successors who helped Coffs Harbour prepare their CKPoM in 2000, then in 2007finalised the PNF Code of Practice that specifically excluded core koala habitat from logging, and then in 2007 began systematically approving logging of core Koala habitat in the Coffs Harbour LGA, with 2,000 of the 19,000 ha of identified core Koala habitat approved by 2010. It is highly probable that prior to 2007, NPWS and DLWC turned a blind eye to its logging

Individual Koala Plans of Management (IKPoM) have had limited effectiveness. The principal problems are that they are only required to be prepared at the end of the planning process after land is rezoned and developments have been approved, they are only required for Council decisions, they are prepared by developer's consultants and thus biased, and they can over-ride CKPoMs.

The excuse of leaving consideration of Koalas up to a future process, such as a site specific KPoM, has been proven to fail as it allows for significant destruction of core Koala habitat and degradation of Koala corridors to occur before the impacts and mitigation measures are considered. It is shutting the door after the horse has bolted.

Similarly approving a development subject to monitoring of impacts is a furphy as DoPE have proven they ignore the outcomes, though most significantly they are unwilling to limit activities once they are approved irrespective of the results of monitoring. It is also apparent that once a development is approved then often 'development creep' occurs where variations are used to increase the scale and impact of the development. It is the death of a thousand cuts

If the intent of SEPP 44 is to be achieved it is essential that when development is proposed that affects potential or known core Koala habitat or movement corridors that the impact on Koalas is considered and mitigated at the very first step in the planning process (i.e. masterplan and rezoning stage).

The restrictive definition of core Koala habitat creates problems as it is not flexible enough to account for additional areas of high quality Koala habitat that do not satisfy the restrictive species and criteria. For example in its preparation of a draft CKPoM Byron Shire Council identified potential Koala habitat that was verified in local studies. Following complaints from a Councillor that this did not comply with SEPP 44 definitions, the delineation of "potential Koala habitat" was changed to comply with SEPP 44, resulting in 206 ha of native vegetation that were identified as Class A or B Koala habitat in Council's mapping being removed, and areas not identified as Koala habitat being elevated to "potential habitat" , the draft KPoM notes:

> *Additionally some areas of important koala habitat, such as scattered individual koala food trees, or areas containing koala food trees but not meeting the SEPP 44 definition will not be included in the koala habitat maps.*

There needs to be allowance for flexibility in SEPP 44 to vary the identification of potential and core Koala habitat where this is justified in local Koala habitat studies.

It is clear that the only way of ensuring protection of core Koala habitat is to firstly identify it and secondly zone it for environment protection. While this was the clear aim of SEPP 44 it appears that NSW Government agencies, after an initial success, have colluded to obstruct the process and undermine the outcomes.

SEPP 44 requires that a local environmental plan include land identified as a core koala habitat within an environmental protection zone, or to identify land that is a core koala habitat and apply special provisions to control the development of that land. I

The five Northern Councils of Tweed, Byron, Ballina, Lismore and Kyogle encompass identified Australian and world Biodiversity Hotspots, have the most threatened species in NSW, and are identified key refuges for Koalas. The councils went through lengthy processes to fulfil policy and strategy requirements to identify high conservation value native vegetation, including Koala habitat, for inclusion in environmental zones, After the proposed zones had been exhibited in 2012 the Government intervened to delete all environmental zones and environmental clauses from the final LEPs. They were classed as deferred matters, meaning the old zones and old LEPs apply to those areas.

After a prolonged process in 2015 DoPE released criteria that only allow land to be included in Environmental Zones if the "*primary use of the land is considered to be environmental conservation".* This, and the detailed environment information required, effectively prohibits core Koala habitat outside pre-existing E zones from being included *within an environmental protection zone* unless a landowner agrees that they already manage it for conservation. This directly contravenes SEPP 44 and effectively prohibits far north coast Councils from including most core Koala habitat in Environmental zones. So far both Kyogle Shire Council and Lismore City Council have totally abandoned environmental zones, while the others are still trying to work out if anything can be protected. The Government now seems intent on rolling this out across NSW.

Ballina Shire Council's attempts to protect Koala habitat from poorly regulated logging by requiring consent in their LEP was rejected by the DoPE, who will not countenance any alternative means of protecting core koala habitat.

The ability to protect core Koala habitat in the Environmental Zone 2 over private lands needs to be urgently reinstated for Far North Coast Councils, irrespective of a landowner's management intent, and the right to protect it in E2 zones maintained elsewhere in NSW.

The preparation of Comprehensive Koala Plans of Management in accordance with SEPP 44 is the most efficient and effective means of identifying potential Koala habitat and habitat links, identifying core Koala Habitat for protection, and detailing appropriate development controls. It is essential that core Koala habitat be identified up-front in the planning process if there is an intent to protect it.

Core Koala Habitat needs to be defined to encompass recent sightings OR evidence of Koala presence (i.e. scats, distinctive scratch marks) OR historical records of a population. It is essential that areas of "land with a resident population of koalas", and high quality habitat with evidence of an historical presence, are given the highest protection. Allowance needs to be made for the inclusion of locally significant feed trees.

The NSW Government needs to take on the responsibility for identifying and mapping potential and core Koala habitat (including habitat links), provide clear guidelines for the implementation of SEPP 44 and allocate sufficient resources to complete the preparation and finalisation of Comprehensive Koala Plans of Management within 10 years.

To avoid artificial borders and incomplete coverage it would be preferable to prepare Comprehensive Koala Plans of Management for OEH Areas of Regional Koala Significance (ARKS), or sub-populations within them (Paull et. al. 2019). These may comprise a number of Local Government Areas or only part of one. Ideally they would cover all land tenures and identify core Koala habitat, potential Koala habitat, habitat linkages and priority areas for revegetation.

The need to comply with the aims of SEPP 44 and prepare site specific IKPoMs must be one of the first steps in any planning process by all approval authorities. IKPoMs need to be prepared independently of developers and subject to review by an independent expert panel. IKPoMs should be required to be compatible with CKPoMs (including exhibited drafts).

In accordance with SEPP 44, Councils should be encouraged to protect Core Koala Habitat in E2 zones in Local Environment Plans, on public lands it should preferably be incorporated into National Parks, or where this is not appropriate included in FMZ2 zones on State Forests. The ability of the northern Councils to protect identified Koala habitat in Environmental Zones should be reinstated.

Landowners need to be provided with incentives for long term protection and enhancement of core Koala Habitat and corridors.

1 (c) 1. Comprehensive Koala Plans of Management

SEPP 44 also encourages Councils to systematically identify areas of 'core koala habitat, stating that councils "should" conduct koala surveys, and take the results regarding core koala habitat into account when making environmental protection zones and development control plans.

SEPP 44 also allows Shire-wide KPoMs to be prepared, often termed Comprehensive KPoMs, for approval of the Director General of Planning. In the 24 years since SEPP 44 came into force five CKPoM plans have been adopted and approved by the Department of Planning and Environment, with two only for parts of Local Government Areas. Of these, only the Ballina and Coffs Harbour KPoMs identify 'core koala habitat' across the LGAs, with the Kempsey plan only identifying it in two small areas. Elsewhere various classes of Koala habitat has been identified.

The callous disregard of the Government agencies for Koalas is exemplified by the fact that it was NPWS (later incorporated into DECCW) who in 1999 identified core Koala habitat in the Coffs LGA, then it was DECCW that in 2007 finalised the PNF Code of Practice that specifically excluded core koala habitat from logging, and it was DECCW that in 2007 began systematically approving logging of core Koala habitat in the Coffs Harbour LGA, with 2,000 of the 19,000 ha of identified core Koala habitat approved by 2010 (see Council Case Study 4: Coffs Harbour CKPoM core Koala habitat). It is highly probable that prior to 2007, NPWS and DLWC turned a blind eye to its logging. It is also apparent that after 1999 core Koala habitat continued to be cleared. It is yet to be seen whether the Ballina CKPoM will be equally ineffective.

The other three CKPoMs identify various classes of Koala habitat but fail to identify core Koala habitat anywhere, except for in two small areas near Kempsey. Instead leaving it up to further assessment to identify.

The Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) **was** developed throughout the 1990's, endorsed by Council in 2001, and approved by the Department of Planning in 2002. The plan only maps preferred and secondary koala habitat and 'core koala habitat' is only mentioned once in the plan.

The Kempsey Council **Comprehensive Koala Plan of Management (CKPoM)** for the Eastern Portion Kempsey Shire LGA came into effect in 2011, covering the coastal third of the LGA. It only identifies core koala habitat for two small areas within the study area, instead identifying 'preferred' koala habitat elsewhere.

The Lismore Council Comprehensive Koala Plan of Management for south-east Lismore (CKPoM) covers part of the southeast of the LGA, was 18 years in the making and was approved by the NSW Department of Planning in 2013. It includes indicative maps of *preferred koala habitat* and does not identify core koala habitat, rather specifying a process to identify it. There is a map that identifies core Koala habitat around Lismore though it is only referred to as an example of the methodology.

There are a large number of Councils that are in the process of preparing draft CKPoMs for all or parts of their areas that have not progressed after years of stuffing around by both Councils and DoPE. It is apparent that the principal failure has been the lack of meaningful support for Shire wide mapping since Coffs Harbour. Some grant funding has been available to councils through the *Saving our Species* program, though the process followed has been ad hoc.

The Government's intent to fundamentally change SEPP 44, including re-defining the definition of core Koala habitat, is likely to throw these draft CKPoM into disarray, which given previous history is likely the intent.

It also needs to be recognised that the Councils overseeing preparation of CKPoMs have political agendas that do not necessarily coincide with the aims of SEPP 44. For example Byron Shire Council, at the 4 August 2016 Ordinary Meeting, resolved (Resolution 16 -435) to amend the draft Byron Coast CKPOM and submit it to the Director of the Department of Planning and Environment for approval in accordance with SEPP 44

This adopted draft KPoM represents a significant weakening of the original 2013 draft CKPoM because it removed limits on what Council could approve within 50m of core Koala habitat and within Koala habitat linkages, leaving no limits to which Koala habitat can now be destroyed provided offsets or financial compensation are provided.

The definition that habitat buffers "*means a 50m wide strip of land*" around "*any mapped area of Preferred Koala Habitat*" (ie potential Koala habitat) was dropped and no distance is now specified, making it very ambiguous. Similarly the requirement that "*Council cannot approve a development application to which this section applies unless it is satisfied that the proposal will not impact on the associated area of Preferred Koala Habitat*" was removed and replaced with vague limitations.

The first draft of the CKPoM identified 5.6 Strategic Linkage Areas that are a subset of Council's mapped wildlife corridors, *which "means a broadly defined but indicative area of land approximately 200m wide that has been identified for the purposes of facilitating the movement of koalas within and between* [Koala Management Precincts]". These were removed and replaced with existing broad wildlife corridors that are not specifically targeted at Koalas. The identification of explicit corridors for Koalas, both between and within KMPs, is considered to be an essential action. The requirement that "*Council cannot approve any development application to which this section applies unless it is satisfied that the proposal will not sever or otherwise interfere with the movement of koalas within a SLA*" was deleted.

It is also apparent that many councils have no intent to prepare CKPoMs for political reasons.

1 (c) 2. Individual Koala Plans of Management - the Byron Experience.

Before Council can grant consent to a Development Application (DA) it must determine whether potential Koala habitat exists on a site and then must "*satisfy itself whether or not the land is core Koala habitat*". If core Koala habitat is identified then a IKPoM must be prepared and Councils determination of the DA must not be inconsistent with the plan.

IKPoM's are only required at the last stage in the development process, after the land has been zoned for development, masterplans have been approved, and/or a Development Control Plan has been prepared. It is akin to shutting the door after the horse has bolted, as by the time the DA is submitted most of the damage has been done. The Department of Planning use the need for future KPoMs an excuse for ignoring them at the rezoning and Development Control Plan stages.

Along the south-east coast of Byron Shire there are patches of core Koala habitat in a matrix of wetlands, urban areas, farmlands and music festival sites. An isolated population totalling some 240 Koalas has a tenuous hold on survival, having to disperse through tourist resorts, past urban areas and across the main roads in order to access the small patches of habitat essential for maintaining a viable population. To the north-east of Byron Shire (north of the Brunswick River) the Koala population has already been so diminished it is identified as an Endangered Population.

Both Tweed and Byron Shire Councils have prepared draft Comprehensive Koala Plans of Management (CKPoMs) though neither have been adopted by the State Government. Byron Shire Council resolved in August 2016 to submit its draft Byron Coast CKPOM to the Director of the Department of Planning and Environment for approval in accordance with SEPP 44, though the department refused to approve it.

As Council still does not have a legally recognised CKPOM its planning process relies on ad hoc individual KPOMs submitted with Development Applications. This has been extremely problematic and does not provide the co-ordinated regional approach required to conserve Koalas. This problem

has been encountered with numerous developments, it is the death of a thousand cuts. A few examples are presented below.

In 2009 the NSW Government took over control of a site to the west of Byron Bay proposed for the largest single urban development in Byron Shire's history, right in the middle of a vital Koala corridor (2.3.1. Council Case Study 1: West Byron urban development). The development site contains small patches of occupied core Koala habitat that are vital stepping stones for the dispersal of Koalas to the north and south of Byron Bay.

Bureaucrats in the Department of Planning were entrusted with the survival of Byron Bay's Koalas. They then proceeded to do everything they could to approve the development. They accepted the proponents claims without question, ignoring planning guidelines, expert advice, a draft Comprehensive Koala Plan of Management (CKPoM) and strong community opposition. They did not bother to seek independent expert advice, and at one stage were not even proposing that a Koala PoM should be prepared at a later stage. The outcome was to rezone 37% of the 5.5ha of core Koala habitat on the site for housing, another 31% was included in an E3 zone with a long list of allowable uses, and large areas around and up to the edge of the remaining core Koala habitat were zoned for medium density housing. Their draft Development Control Plan also proposed a network of roads and tracks around and through the core Koala habitat.

Two Development Applications were lodged for West Byron in 2018, both of which denied the presence of core Koala habitat on their sites - despite being identified as such in Council's draft Coastal KPOM (which the Government refuses to adopt). Only one developer reluctantly prepared their own Koala Plan of Management (KPoM). They decided to ignore many of the requirements for Koalas in Council's DCP and draft Coastal CKPOM, including the need to exclude dogs from the site. Instead they decided to not buffer Koala habitat and construct Koala proof fences around the habitat to be retained, which would severely reduce the ability of Koalas to disperse through the site, while creating potential Koala traps in the form of bottlenecks and cul-de-sacs.

There is everything wrong with a process that leaves the preparation of a KPoM up to the last step after much of the damage is done by rezoning significant areas of core Koala habitat for housing and infrastructure development. This is amplified by the developer then being allowed prepare their own patently deficient KPoM in contravention of Council's and Koala's requirements.

This is the major failing of SEPP 44. It is only after land is rezoned for development that Koalas are required to be duly considered. By then most of the damage has already been done, and nobody is likely to stop development proceeding and expanding irrespective of impacts on Koalas.

The use of a property known to have a significant Koala population at Tyagarah, near Byron Bay, for holding an annual 5 day Blues Festival for 20,000 people (Bluesfest) was approved in 2009 for a trial period until 2012 (2.3.2. Council Case Study 2: Bluesfest). A site-specific Koala Plan of Management (IKPoM) was approved with the Department of Planning requiring a further program of koala habitat assessment and monitoring of individual koalas on the site through radio-tracking.

The first festival was held in 2010 and the results of Koala monitoring showed at least four of the six koalas showed aversive behaviour (leaving their home ranges or retreating to the edge of their ranges away from the music), and 6 of 11 dying (some from the stress of capture). On the second monitoring in 2012 there was an overall population decline, only one recapture, 4 of 7 Koalas died, and a number of koalas showed aversive movements. On the third monitoring in 2013 there was a further population decline, there were no recaptures, 3 of 6 Koalas died and a number of koalas

showed aversive movements. On the fourth monitoring in 2014 there were 3 recaptures, 2 of the six Koalas died, one was removed from the site for treatment, and one lost its joey. There has been a consistent withdrawal of Koalas from habitat within the vicinity of the stage area, and a high mortality of those that stay.

The evidence is that core habitat has been converted into sink habit with high mortality and a declining population. The first consultant to Bluesfest expressed alarm at the aversive behaviour and high death rate, in part due to the capture process. Subsequent consultants attacked his credibility and ignored their own results by claiming there is no significant or lasting impacts. Despite the concerning results, in 2011 Bluesfest was given permanent approval. In 2015 Bluesfest was allowed to increase their number of festival days from 5 to 20 with an unlimited number of smaller events.

Even though the department's required monitoring revealed a declining population and high mortalities (in part due to the monitoring), undeterred, in February 2014 DoPI gave approval for a revised KPoM based on a fourfold increase in large events and unlimited smaller events, subject to yet more monitoring, this time aimed at reducing compensatory habitat. Advice to avoid more events in the breeding season, along with other mitigation measures, were ignored.

This is a rare example of monitoring actually being undertaken, though the alarming results appear to have had no effect on outcomes, aside from apparently increasing Koala mortality. While the department was provided with differing interpretations from experts, they appear incapable of undertaking an independent evaluation, instead uncritically adopting the proponents position.

This was repeated further to the north in the Tweed-Brunswick Endangered Koala Population.

As the last major link left between the coast and hinterland in this region, the Yelgun (Jones Road) corridor is of outstanding importance - particularly for maintaining the possibility of dispersal and genetic exchange between hinterland Koalas and the Tweed-Brunswick Endangered Population. A 1997 Commission of Inquiry identified the importance of protecting its existing and potential wildlife corridor values, and both the NPWS (2000) and Council (2004) identify it as a regionally significant corridor. Taxpayers have spent millions to get underpasses and an overpass to facilitate animals crossing the highway near this site. Despite this the Splendour in the Grass music festival was first approved for the site in 2009.

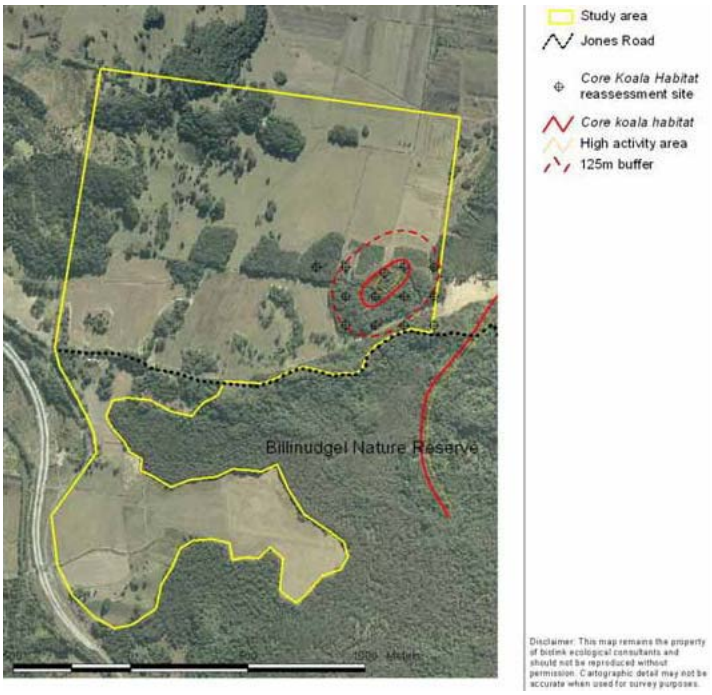
Based upon the evidence presented to the Commission of Inquiry for North Ocean Shores, Commissioner Cleland (1997) found that:

> *"… corridors can be considered important as it can be clearly drawn from the evidence that wildlife species live and move along corridors. Moreover, it is reasonable to conclude that as fragmentation of natural areas continues the remaining natural areas will become increasingly more important to maintain wildlife movements and ecological processes."*
>
> *"Of significant relevance in balancing wildlife corridor values and other land use consideration are the precautionary principle and the conservation of biological diversity. These principles reinforce the importance at this point in time of protecting the existing and potential wildlife corridor values in the Jones Road area.*
>
> *" … the conservation of biological diversity necessitates the maintenance of wildlife corridors to promote genetic exchange between populations of native species and to enhance species survival in the long term."*

Cleland recommended that the majority the wildlife corridor be zoned for environmental protection with the remainder zoned for agricultural protection. This was generally supported by government departments and community groups. (Cleland Inquiry, 1997)

In 1997 the RTA acknowledged the findings of the Cleland Inquiry in recognising the importance of the Marshall's Ridge wildlife corridor when upgrading the Pacific Highway. Considering it so significant they spent $3.5million on an overpass, some $400,000 on two underpasses and around $1 million on associated works. They also re-routed the highway to avoid the area and purchased compensatory habitat. Our taxes paid for this.

A koala habitat assessment was undertaken in 2007 as part of an application lodged with council for a proposed trial Splendour in the Grass music festival at the site, it identified an area of core Koala habitat in the central east of the site.



Due to the presence of core Koala habitat, a KPoM was prepared by Biolink Ecological Consultants in 2008 for the purposes of the proposed trial event - the reassessment recorded significantly lower levels of Koala activity in the vicinity and the disappearance of core Koala habitat (Biolink 2008). Given "*the recorded disappearance of habitat and observed decline in Koala presence*", in giving its approval the Department of Planning decided to only require a revised KPoM prior to the commencement of any events carried out at the site.

Given the presence of primary Koala habitat, the previous identification of core Koala habitat, and the fact that this is a regionally significant corridor linking coastal and hinterland Koalas, it is outrageous that the required Koala Plan of Management was not required to be prepared until after the development was approved.

The project was granted a 5-year trial approval by the NSW Planning and Assessment Commission in April 2012 up until the 31st of December 2017 to allow for a large event of 25,000 people per day, a medium event of 15,000 people and a small event of 10,000 people per day.

In 2016 the Koalas of the coastal lowlands between the Tweed and Brunswick Rivers east of the Pacific Highway were identified as an Endangered Population under the Threatened Species Conservation (TSC) Act 1995.

In September, 2017 the Planning Assessment Commission (PAC) granted approval for a 20-month extension. In 2019 the Yelgun site was given permanent approval for two five day festivals for 50,000 and 35,000 people per day, three 'medium' event days for up to 25,000 people per day, five 'small' event days for up to 5,000 patrons per day, two 'minor' day-long community events for up to 1,500 people and extensive infrastructure.

Given the regional importance of the Yelgun corridor it should have been consolidated and expanded by plantings rather than having a music festival approved within it. The findings from the Bluesfest site show it is unlikely that the Yelgun corridor will ever be suitable for Koalas again.

1 (c) 3. Zoning core Koala habitat for protection

In order to give effect to the aims of SEPP 44 it is identified that Councils "should":

> *(a) survey the land within its area so as to identify areas of potential koala habitat and core koala habitat, and*
> *(b) make or amend a local environmental plan:*
> > *(i) to include land identified as a core koala habitat within an environmental protection zone, or*
> > *(ii) to identify land that is a core koala habitat and apply special provisions to control the development of that land, and*
> *(c) give consideration to preparing an appropriate development control plan for land that is or adjoins a core koala habitat.*

The 2016 draft Byron Coast Comprehensive Koala Plan of Management notes "*In this Plan potential koala habitat within a Koala Management Precinct is considered to meet the definition of core koala habitat*". An action of the draft Byron Coast Comprehensive Koala Plan of Management is "*Council shall amend Byron LEP 2014 to zone for Environmental Protection areas of core koala habitat*."

The Local Government areas of Tweed, Byron, Ballina, Lismore and Kyogle encompass the spectacular volcanic remnants of the Tweed Shield Volcano, centred on Mount Warning, and the Focal Peak Shield Volcano, centred near Mount Barney. The volcanic ranges support rainforests, and the sedimentary soils of the valleys eucalypt forests and wetlands. Heathlands, swamps, melaleuca wetlands, saltmarshes and mangroves characterise coastal vegetation.

These Local Government areas are part of "Border Ranges North and South", one of Australia's 15 outstanding biodiversity hotspots, areas which are rich in biodiversity but also under immediate threat. The supporting information states:

> *This sub-tropical and temperate hotspot is one of Australia's most diverse areas - and it is the most biologically diverse area in New South Wales and southern Queensland. It has a variety of significant habitats: subtropical rainforest, wet sclerophyll forest, mountain headlands, rocky outcrops and transition zones between forests.*
>
> *These habitats support a huge variety of bird and macropod species. Many are rare or threatened …*

This region's high population growth, with associated urban and tourist developments along the coast, is a major cause of habitat loss and fragmentation. Although most remaining natural areas are protected, they are under considerable threat from weeds, fire and recreational use.

The rainforests of the area are of international significance as evidenced by the inclusion of many of the National Parks in the World Heritage Gondwana Rainforests of Australia, with more recent national parks identified as qualifying for addition. The Big Scrub once covered 75,000ha and was Australia's largest area of subtropical rainforest. It is estimated that there is now only some 664 ha of the Big Scrub remaining as small fragments scattered across its former distribution.

As well as being identified as one of Australia's biodiversity hotspots, these landscapes have been branded as Australia's Green Cauldron, a centrepiece of national tourism as one of Australia's15 'National Landscapes' – *"places that capture the essence of our country - our most inspirational environments offering world class natural and cultural experiences"*. Tourism is a major driver of the regional economy.

The region has been extensively cleared, particularly floodplain and lowland vegetation.

The Border Ranges Rainforest Biodiversity Management Plan (2010) identifies that:

Currently a relatively small area of private and public land (less than one per cent) within the Planning Area is protected to varying degrees under a range of voluntary conservation covenants including Land for Wildlife, wildlife refuges, nature refuges or local government environmental protection zoning arrangements.

There is a need to increase the area of native vegetation, maintain and enhance linkages between remnant areas, and to ensure the retention and enhancement of remnant vegetation. It is particularly important to identify the high conservation value vegetation and habitats remaining in the region and ensure they are appropriately zoned.

Aside from SEPP 44, there are abundant planning directives that require the zoning of high conservation value vegetation for protection. For example the Far North Coast Regional Strategy (2006)includes the following actions.

Local environmental plans will protect and zone land with State or regional environmental, agricultural, vegetation, habitat, waterway, wetland or coastal values

...

Local environmental plans will include provisions to encourage habitat and corridor establishment in future zoning of Environmental Assets and Rural Land area.

New development adjoining or adjacent to farmland, extractive resources, waterways, wetlands and areas of high biodiversity value will incorporate buffers to avoid land-use conflict.

The Far North Coast Regional Conservation Plan (DECCW 2010) emphasises "*As outlined in this RCP and in the FNCRS, areas of validated high conservation value land should be protected in new LEP provisions"*.

Practice Note PN 09-002 (Environmental Protection Zones) states that:

The environment protection zones E2 through to E4 are applied where the protection of the environmental significance of the land is the primary consideration. Their importance for visitation, tourism and job creation should also be carefully considered.

Prior to applying the relevant zone, the environmental values of the land should be established, preferably on the basis of a strategy or from an environmental study developed from robust data sources and analysis. This is particularly important where land is identified as exhibiting high ecological, scientific, cultural or aesthetic values outside national parks and nature reserves. For example, in most cases, council's proposal to zone land E2 needs to be supported by a strategy or study that demonstrates the high status of these values. Under such a strategy or study, zoning would need to be appropriate and land uses would need to be capable of being sustained.

DEP identifies the E2 zone is to be for:

This zone is for areas with high ecological, scientific, cultural or aesthetic values outside national parks and nature reserves. The zone provides the highest level of protection, management and restoration for such lands whilst allowing uses compatible with those values

DEP identifies the E3 zone is to be for:

This zone is for land where there are special ecological, scientific, cultural or aesthetic attributes or environmental hazards/processes that require careful consideration/management and for uses compatible with these values.

Byron Council's 2004 Biodiversity Strategy identifies core Koala habitat as being of very high conservation value and thus proposed that high quality required be included in E2 where mapped.

Following public controversy over environmental zoning in new LEPs, in September 2012 the then Minister for Planning announced that there would be a six months review of E zones just for Tweed, Byron, Ballina, Kyogle and Lismore Local Government Areas. The Minister for Planning then removed all environmental zones (E2 Environmental Conservation, E3 Environmental Management and E4 Environmental Living zones) from far north coast LEPs after they were exhibited. These proposed EZones are now in limbo in the gazetted LEP's as "deferred matters". Within these deferred areas the old LEP zoning and requirements apply, meaning that Councils now have two different LEPs in operation.

The 'Northern Councils EZone Review Interim Report' was completed in September 2013, though was not released for public comment until May 2014. The review supported the inclusion of environmental zones and overlays in far north coast Local Environmental Plans provided they were based on clear criteria and accurate mapping, noting that "*where high conservation value features or other 'special' features occur in each council, they should be mapped and zoned appropriately as an EZone*".

While the EZone review supported the protection of high conservation value native vegetation, it ignored the requirements of SEPP 44 by recommending:

Ballina SC, Byron SC and Tweed SC are currently preparing Koala Plans of Management for the coastal zones within their respective councils. Each council should insert a clause into the relevant SILEP that regulates development in areas of Koala habitat (identified on an accompanying Koala habitat overlay) upon completion of the relevant Koala Plans of Management.

Lismore, Tweed, Byron and Ballina have now undertaken Koala habitat assessments over parts of their lands and identified core Koala habitat. Overlays provide inadequate protection for such areas. In accordance with SEPP 44 these lands should be given the highest protection in an E2 zoning.

After the Minister for Planning excluded environmental zones from Ballina's LEP, Council became concerned with the increasing logging of Koala habitat under PNF approvals. Which led to the council to vote in late 2014 to amend the Ballina Local Environment Plan 1987 to introduce a requirement for council consent for anyone undertaking private native forestry (PNF) in the shire. Council staff prepared a planning proposal to amend the LEP, which was lodged with the NSW Department of Planning and Environment for a 'Gateway determination' in January 2015. DoPE reject the planning proposal, so Council resolved to submit a review application. The Echonet, May 25, 2015 reported:

> *Cr Paul Worth, who led the charge against PNF, said there was limited assessment of ecological and amenity impacts associated with EPA approvals.*
>
> *He said PNF was an emerging activity in the Bagotville, Meerschaum Vale, Wardell, Coolgardie and the broader Blackwall Range localities.*
>
> *He said those areas had been identified by the council as ecologically significant, important from a scenic amenity perspective, and also contained important habitat for threatened species such as koalas.*
> *...*
> *'In the absence of the planning proposal being able to proceed, there is a risk of an open ended continuation of private native forestry with very limited regulation and further adverse impacts in relation to amenity, ecology, soil erosion, sedimentation, noise, traffic and roads,' staff have warned in their report.*

The 'Northern Councils EZone Review, Final Recommendations Report' (DoPE 2015) notes

> *E2 and E3 zones will only be applied if the primary use of the land is considered to be environmental conservation (E2) or environmental management (E3) and the land has attributes which have been verified to meet the criteria for an E2 or E3 zone*

The "primary use" has become the pre-eminent consideration. For a Council to establish that the primary use is for "*environmental conservation or management, the environmental values of the land and vegetation need to be demonstrated and the absence of any agricultural or other land use confirmed*". Even the highest value vegetation (ie the Federally Critically Endangered Lowland Rainforest of Subtropical Australia occurs on private land in the Tweed, Byron, Ballina and Lismore LGAs), can only be zoned for E2 if either the landowner agrees or Councils can first prove that it is already primarily managed for conservation. This establishes a threshold that requires Councils to have evidence of a landowner's management intent, such as a conservation agreement or signed statement.

Land currently zoned for environmental protection (7a, 7b, 7j 7k and 7l) can be zoned as E2 or E3, without considering primary use, provided that it meets the criteria for that zone (many currently zoned lands are likely not to satisfy the new criteria).

Even with restricted criteria, Councils now have verify that vegetation satisfies the criteria in a process effectively requiring property level assessments, unless a landowner volunteers part of their land for an EZone. An E2 or E3 zone or other mapped planning controls cannot be applied to land unless the attributes that meet the E2 or E3 criteria have been verified on that land. For

environmental values verification requires either biodiversity field inspections and ground surveys conducted by an appropriately qualified person or supporting flora and fauna reports conducted by a suitably qualified person "guided by the *Draft Framework for Biodiversity Assessment*, NSW Office of Environment and Heritage (2014) and the *Draft Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities*, NSW Department of Environment and Conservation(2004)", where the fieldwork is less than 5 years old. Basically both approaches effectively require detailed flora and fauna surveys for each property in order to place an EZone over it. Recent aerial photography mapping can only be used in conjunction with such surveys.

The *Framework for Biodiversity Assessment* quantify and describe the impact assessment requirements and offset guidance that apply to Major Projects, while the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* are for determining whether a proposed development, activity or action is likely to have a significant effect on threatened biodiversity. These identify minimum survey effort required for assessing the environmental impacts of developments involving the clearing or significant modification of native vegetation and the habitat of threatened species, their requirements for detailed site surveys are an unnecessary requirement for deciding whether to zone an area of native vegetation for environmental conservation or management. This intentionally establishes a level of assessment that Councils cannot afford to undertake, assuming the landowner will even allow them to.

A vegetation map will be allowed to be used as an overlay (for consideration when giving development consent), but only after it has been verified in the above manner.

The thresholds now proposed make it unrealistic for Council's to be able to zone land for E2 or E3, or even use vegetation as an overlay, unless a landholder agrees (with agreement, land that doesn't satisfy the criteria can be zoned E2 or E3). This also applies to existing conservation zones unless the Council can afford to undertake the detailed assessments necessary to map and verify criteria.

Extensive agriculture (grazing, cropping) will be allowed with consent in E2 zones and without consent in E3 zones.

This effectively contravenes SEPP 44 and prohibits far north coast Councils from implementing one of its core objectives.

The DoPE state:

> *The Final Recommendations will initially apply only to the five Far North Coast councils. The Department of Planning and Environment will investigate the implications of these recommendations for the rest of the State. However, if other councils in the State are reviewing the application of E zones, then the principles contained in these recommendations can be used.*

Since then Kyogle Shire Council and Lismore City Council have determined to remove all environmental zones from their LEPs. The process of trying to zone areas for environmental protection has now become prohibitive, it is yet to be seen whether Tweed, Byron and Ballina will be able to overcome then Planning Minister, Rob Stokes, legacy. High conservation value vegetation, including core Koala habitat, will no longer be zoned for protection in those parts of one of the world's biodiversity hotspots and one of NSW's strongholds for Koalas.

1 (d) identification of key areas of koala habitat on private and public land that should be protected, including areas currently at risk of logging or clearing, and the likely impacts of climate change on koalas and koala distribution,

When announcing the new Koala Strategy on 7th May, 2018, the Government's press release stated:

> *The centerpiece of the NSW Koala Strategy is setting aside large swathes of land where koalas can thrive and new habitats can be created.*
>
> *"It is absolutely vital that we protect land where koalas currently live - and secure land where new koala colonies may exist in the future," said Environment Minister Gabrielle Upton.*
>
> *"Initially, 24,538 hectares of State forest will be set aside for koalas – with more to come.*

Regrettably the only criteria applied by the NSW Government appears to have been selecting non-commercial areas of State Forests, with no regard for Koala habitat or Koala Hubs.

A NEFA review (see reports on https://www.nefa.org.au/koalas) of the NSW Governments 12 proposed Koala Reserves which underpin their Koala Strategy identifies :

- Ten are already protected as part of the informal reserve system (as FMZs 2 and 3)
- Only 3 have high quality Koala habitat as modelled by DPI-Forestry identified within them, and 2 of these have no recent records to substantiate the models.
- Four have no records of Koalas, and only 2 have records within the past 10 years.
- Only 3 contain Koala Hubs, totalling just 181 ha (0.9%) of the Koala Hubs on State Forests.
- Only 3 can in part be justified to contain high quality Koala habitat, and these exclude adjacent areas of high quality habitat

Four of the new Koala reserves (Barrington Tops, Carrai, Mount Boss, and Meryla) are totally outside the OEH ARKS and two (Corrabare, Olney) are mostly outside ARKS. Of the 12 new Koala Reserves only 3 contain Koala Hubs: Mount Lindesay 90ha, Watagan 36ha, and Belanglo 55ha. By comparison the proposed Great Koala National Park has 8,697 ha (44%) of the Koala Hubs on State Forests.

On the available evidence only three of the Koala Reserves specifically warrant protection for Koalas: Mount Lindesay, Watagan, and Belanglo. In these cases it is apparent that their effectiveness would be greatly enhanced by expansion to include adjacent areas of identified high quality Koala habitat on State Forests. It is also apparent that Mount Lindesay was only chosen because it is suffering from chronic logging dieback and in urgent need of rehabilitation.

In 2018 the Government proposed 12 new Koala Reserves from State Forests, though these were mostly selected from areas where logging was already excluded, or where the forest was severely affected by dieback. Only 3 of the chosen areas are considered to be justifiable on the basis of Koala habitat. Regrettably the only criteria applied by the NSW Government

appears to have been selecting non-commercial areas of State Forests, irrespective of Koala occupancy.

In 2017 OEH analysed Koala records to identify areas of "*currently known significant koala occupancy that indicate clusters of resident populations known as Koala Hubs*". A total of 567 Hubs were identified. totalling 101768 hectares, or around 0.13% of NSW. These occur across all tenures, with 19,785ha on State Forests and 66,162ha on private lands. These are by definition key areas of koala habitat that should be protected, though they are currently being targeted for logging on State forests.

WWF (Paull et. al. 2019) applied a similar method, using broader criteria, to identify 341,776 hectares of state forests as high priorities for inclusion in the reserve system to protect koalas. In addition 71,094 hectares of Crown, NSW Government and Australian Government lands is identified as known high priorities for the protection in national parks or to be managed as components of regional systems of retained habitat.

One million hectares of lands within the WWF Koala Hubs occur on private lands, encompassing some 508,265 hectares of potential priority habitat for koalas, which "*need to be the immediate focus of measures and incentives to protect koala habitat from clearing, urbanisation, private native forest logging, further fragmentation and other threats. Within these areas there is a need to identify and protect core koala habitat and increase connectivity between patches*".

This is considered to be the best available data for identifying Koala reserves on the scale needed based on Koala records. This confirms the proposed Great Koala National Park as the highest priority single area in NSW for Koala protection.

NEFA's surveys, and those of others, have so far proven Royal Camp, Carwong, Gibberagee and Braemar State Forests on the Richmond River lowlands to contain significant populations of Koalas. The areas of significant Koala occupancy all adjoin the Richmond River floodplain. These lowland forests are dominated by Spotted Gum with significant numbers of the Koala preferred feed trees of grey gums, grey box and/or red gums. The evidence is that the remnant forests on the Richmond River lowlands are, at least in part, of regional, or national, significance for Koalas.

1 (d) 1. Koala Hubs

The Office of Environment and Heritage (OEH) has been involved in developing data on Koala habitat with the aim of implementing recommendations of the Independent Review into the Decline of Koala Populations in Key Areas of NSW (NSW Chief Scientist and Engineer 2016), specifically:

- *Identify key koala populations and management areas which have the potential for long term recovery and viability*
- *Identify priority threats to key koala populations at the population scale*
- *That government agencies identify priority areas of land across tenures to target for koala conservation management and threat mitigation*

The OEH reports and data prepared in response to the Chief Scientist's recommendations were released to the National Parks Association under a Government Information (Public Access) request.

For one of their assessments OEH (undated) have analysed Koala records *"to delineate highly significant local scale areas of koala occupancy currently known for protection",* noting:

> *These areas are not designed to be an exhaustive account of all koala presence across NSW, but rather define areas of currently known significant koala occupancy that indicate clusters of resident populations known as Koala Hubs.*
>
> *A total of 567 Hubs were identified. Altogether, 101768 hectares, or around 0.13% of NSW is mapped as Koala Hubs.*

As identified by Rennison and Fisher (2018):

> *The fickle nature of koala distribution patterns in NSW highlights the importance of investing significant effort to identify lands currently occupied by koalas, and to focus on the protection of koalas where they reside, rather than protecting habitat as a surrogate for koala occupancy.*

	Mapped Koala Hubs NSW		Mapped Koala Hubs NE NSW		Great Koala NP (proposed)		NSW New Koala Reserves (2018)	
	(ha)	% hubs	(ha)	% NSW	(ha)	% NSW	(ha)	% NSW
National Park	15,904	16	10,532	66	2,521	16		
State Forest	19,785	19	15,522	79	8,697	44	181	0.9
Private	66,162	65	51,463	78	0			
TOTAL	101,851		77,517	76	11,218	11	181	0.2

Tenure of Koala Hubs in NSW (Note there are some small differences to OEH figures due to GIS reporting).

Of the OEH mapped Koala Hubs in NSW, 35,656 ha (35%) occur on public lands. Some 19,785 ha (55%) of these are on State Forests. It is considered that greater survey effort in hinterland areas will significantly increase the number of Koala hubs identified and better delineate their extent.

The Koala Hubs on State Forests are those areas OEH considers are "*highly significant local scale areas of koala occupancy".* While not exhaustive and inadequate on their own, on the basis of available data, these are known to be the very highest priority areas for Koala protection and thus should be the core areas of any reserve system for Koalas and excluded from logging (WWF have undertaken a more inclusive analysis and identified a proposed Koala reserve system based on this approach).

Given this data was available to the Government it is astounding that it was apparently ignored when identifying Koala Reserves in 2018.

This disregard for the OEH Koala Hubs is reflected in the Forestry Corporation's logging of 2,546 ha over the period 2015-2018, with some 430 ha of Koala hubs so far logged since they were identified. Many more are proposed for logging in current harvesting plans, (see Forestry Case Study 4).

Of the total area of Koala Hubs on State Forests in north-east NSW 5,130 ha is within the proposed North Coast Intensive Zone, which will be open to widespread clearfelling.

1 (d) 2. Richmond Lowlands

NEFA's surveys, and those of others, have so far proven Royal Camp, Carwong, Gibberagee and Braemar State Forests to contain significant populations of Koalas.

The areas of significant Koala occupancy identified by NEFA all adjoin the Richmond River floodplain. These lowland forests are dominated by Spotted Gum with significant numbers of the Koala preferred feed trees of grey gums, grey box and/or red gums.

In 2012 the North East Forest Alliance (NEFA, Pugh 2012) stopped the Forestry Corporation illegally logging a Koala High Use Area in Royal Camp SF, with 4 other Koala HUAs about to be logged. The EPA found that the Forestry Corporation had not adequately looked for Koala scats and had logged 61 trees and constructed 405m of snig tracks within a Koala High Use Area.

When the Forestry Corporation resumed logging nearby a few days later NEFA again caught them out. The EPA confirmed that the unrepentant Forestry Corporation had not adequately looked for Koala scats and had logged 7 trees and constructed 230m of snig tracks within another Koala High Use Area. The Forestry Corporation continued logging and were found by NEFA to have logged another Koala HUA.

When the Forestry Corporation proposed to begin logging in compartment 13 in 2013, claiming no Koalas were present, NEFA (Pugh 2014) found extensive Koala HUAs within the proposed logging area. Based on his inspections of Royal Camp State Forest, wildlife expert David Milledge concluded:*"The level of Koala activity revealed by these searches is amongst the highest I have recorded in my experience of over 20 years conducting Koala scat surveys in coastal and escarpment forests in north-eastern NSW. This highlights the significance of Royal Camp State Forest in supporting a dense local Koala population and possibly one of the most important on public land in the region".*

The Environment Protection Authority again confirmed NEFA's findings, informing the Forestry Corporation that they found "*areas that indicate koala high use that is ongoing and contemporary",* noting "*Based upon these findings and recent findings made from investigations undertaken in compartments 14, 15 and 16 of Royal Camp State Forest, the EPA considers these areas contain koala habitat and play an important role to Koala populations in the region".*

The then Minister for the Environment requested the EPA to determine the regional significance of the koala population, with the subsequent report by Dr. Steve Phillips (2014) for the EPA finding a resident koala population within Royal Camp that *"should be considered important at all levels of assessment"* due to the koala populations of the encompassing Richmond Valley LGA being found to be *"endangered on the basis of international, national and state-based conservation criteria".*

In August 2014 the Forestry Corporation engaged Jim Shields to search for Koalas using a sniffer dog, they detected 14 Koalas at a mean density of 0.36/ha in 11 hours of searching.

There are also numerous Koala records in Carwong State Forest. Pre-logging fauna surveys in 1998 found Koala scats throughout the forest, with numerous high use trees, including many with both small and large scats indicating the presence of females with young.

Based on Koala records, in November 2014 NEFA first proposed the creation of the 2,100 ha Sandy Creek National Park incorporating both Royal Camp and Carwong State Forests.

The EPA (2016) study of 4 key areas of State forests known to once have good Koala populations once again verified that Royal Camp and Carwong State Forests have significant populations of resident Koalas:

> *The activity results and Phillips' (2013) report both indicate that Royal Camp and Carwong state forests support extensive areas of koala occupancy and habitat utilisation, and that in compartment 13, at least 50% of the habitat is utilised and conforms to optimal utilisation of secondary habitat by a low density population. The project found that 80% of Carwong and 58% of Royal Camp State Forest is utilised, which supports Phillips' (2013) results. On this basis it can be concluded that habitat in Royal Camp and Carwong is source habitat, where reproduction exceeds mortality on average over time.* (p84)

It is further noted (p86):

> *In relative terms, Carwong appeared to be the least disturbed by logging and fire. Having both wildfire and multiple recent logging events absent for approximately 20 years, appears to correlate with overall highest occupancy compared with other pilot areas that have experienced multiple, more recent silviculture treatments. This result aligns with Smith's (2004) findings that koala prefer areas of least disturbance.*

It is also important to recognise that these forests are regionally, if not nationally, significant as a study of Koalas across the Richmond Valley LGA (Phillips and Weatherstone 2015) identified *"two "Important Populations" as defined for purposes of the Federal Government's Environmental Protection and Biodiversity Conservation Act 1999",* as "*key source populations for breeding and/or dispersal*", including "*Habitat to the north of Rappville in the general vicinity of Royal Camp and Carwong State Forests and associated lands".* They also found:

> *Extent of Occurrence of koalas across the RVLGA has remained relatively unchanged over time. However, further analyses of habitat occupancy rates has indicated a statistically significant decrease over the last 3 koala generations of ~33% in the amount of habitat actually being occupied by koalas. This trajectory, if left unchecked, will lead to increasing endangerment of the RVLGA's koala populations over coming years.*

In February 2019 NEFA inspected Gibberagee State Forest soon after logging commenced. We found a widespread breeding colony of Koalas, as shown by most Grey Gums having distinctive Koala scratches and trees with >20 Koala scats. It was evident that the Forestry Corporation were not undertaking the required Koala scat searches to identify Koala High Use Areas in breach of their Threatened Species Licence and were not retaining the 5 Koala feed trees per ha as required in Intermediate Koala Habitat. There were also systematic breaches of habitat tree requirements.

In 2017 we had demonstrated non-compliance with the TSL in another part of Gibberagee, SF yet the Forestry Corporation had continued to log in contravention of the TSL, and the EPA had refused to require compliance - not even bothering to report on breaches until years after the logging was complete. Given this we decided to have a forest action on 13 February 2019, which was resolved when the Forestry Corporation agreed to a site inspection within a week with NEFA, and the EPA if they agreed, to inspect the breaches we had identified. The EPA declined a site inspection with us and a week later the Forestry Corporation reneged on their agreement.

NEFA returned on Sunday 24 February 2019 to audit recent logging. This involved a detailed audit of approximately 6 ha logged since February 13 and random assessments of adjoining areas currently being logged. We found that that the Forestry Corporation were still refusing to comply with their legal obligation to search for Koala scats and Koala High Use Areas ahead of logging, locating

3 Koala high use trees that had not been identified by the Forestry Corporation with >20 Koala scats (111, 21 and 42 scats) around their bases in areas that had been logged while the EPA were investigating. Our appeals for the EPA, the Environment Minister and the Premier were in vain.

We had another action at Gibberagee on 4 and 5 March to try and force pre-logging surveys for Koalas. To resolve the dispute we offered to fund a one day trial using a scat detection dog to identify Koala High Use Areas. The Forestry Corporation refused our offer, though logging was temporarily stopped.

We returned to undertake another Koala scat search, finding that the Forestry Corporation were still refusing to undertake scat searches and identifying a Koala High Use Area in an area yet to be logged. In a token gesture the Forestry Corporation agreed to protect 1ha of the Koala High Use Area, accept that the forest is Intermediate Koala Habitat and to retain the required 5 Koala feed trees per ha, and resumed logging of Koala High Use Areas in May.

On 28 July 2019 NEFA undertook scat surveys over an area of about 3 hectares in Braemar State Forest scheduled for imminent logging and identified 42 trees with Koala scats, including 14 with >20 Koala scats. These included different sized scats indicating the presence of a male, female and young.

The full extent of this Koala HUA is obviously far greater, extending outside the assessed area, likely joining up with the 0.9ha Koala High Use Area identified by Forestry. It is apparent that there are likely to be other Koala HUAs within the logging area.

It would seem from this small, but highly significant, sample that Braemar State Forest, at least in part, is of equivalent importance to the nearby Braemar State Forest.

From our findings there can be no doubt that remnant forests with good numbers of grey gums, grey box and red gums, adjoining the Richmond River floodplain, provide habitat that is of immense importance to the regional survival of Koalas and provide significant habitat for a variety of other threatened species.

It is obvious that the habitat value of these forests for most species has been significantly diminished by past logging and grazing, and that exclusion of these activities will allow habitat values to improve over time, notably for Koalas. It can only be expected that as feed trees age that Koala populations will increase in line with the increasing resources they will provide. The importance of these forests for maintaining Koalas in an era of increasing droughts and heatwaves cannot be under-stated.

2. Case Studies

Six case studies of Government mismanagement of Koalas are presented. The case studies relate to management of public land for forestry, private land for forestry, rezoning of private land for urban development, management of the impacts of a music festival and contempt for core Koala habitat. These all display an abject failure of Government policy, management and regulation. Though the most worrying aspects are the widespread disregard for well-intentioned laws, policies, and strategies, a failure to impartially consider the evidence, and a callous disregard for the fate of Koalas.

These are but a few examples of the wider failure of Government to implement meaningful and effective controls to stop the ongoing decline of Koalas, on both public and private lands. They are a few of the more prominent failures of Government policy on the north coast we have documented, and undoubtedly only represent the tip of the iceberg of abuse of Koalas. We recognise that similar examples will exist throughout NSW, most of which will never see the light of day.

2.1. Forestry Case Studies

2.1.1. Forestry Case Study 1: Pine Creek State Forest

In 1990 "*little was known about the status and distribution of Koalas in the Coffs Harbour local government area, except that it was identified as containing one of the biggest populations in NSW*" (Lunney *et. al.* 1992). NPWS undertook a study:

> *The study found that the density of Koalas has decreased and is now low, and that the population continues to decline. The distribution of koalas is shrinking and is now concentrated in a few local areas....The koala in Coffs Harbour is now almost gone from most of its previous strongholds ...Without an active conservation program, Coffs Harbour faces the prospect that the koala will become unviably rare in this district within 20 years at the current rate of loss and will be at risk of local extinction.*

Smith (2004) recounts how in 1995 he was told of logging being undertaken in Pine Creek State Forest (near Coffs Harbour) in contravention of the Coffs Harbour Urunga Management Areas EIS (SFNSW 1995) which excluded clearfelling from areas with koalas and koala feed trees under a protocol developed in consultation with the NSW National Parks and Wildlife Service that required surveys for evidence of koalas and other threatened species before logging, noting:

> *Site inspections revealed the most destructive and intensive clearfelling that I have ever observed in a State Forest in northern NSW, including the removal of koala feed trees (grey gums with abundant scratches and scats) in contravention of NSW National Parks and Wildlife Service (NPWS) section 120 licence conditions that then regulated harvesting impacts on threatened fauna . ...Extensive gap clearfelling can be considered destructive because it reduces or eliminates habitat for mature, oldgrowth and hollow dependent fauna ... In this case the clearfelling was effectively land clearing.*
>
> *A survey for koalas and koala scats around the edges of logged areas and stumps within clearfelled areas concluded that "the evidence of high levels of koala activity is so abundant in the logged compartments that it could not have been missed by anyone genuinely searching for evidence of koalas" (Moon 1995). Following inspections by officers of NPWS, harvesting operations were suspended in Pine Creek State Forest under the provisions of the Endangered Fauna (Interim Protection) Act 1991 and clearfelling in Pine Creek was*

publicly condemned in local and state media. Approval to recommence harvesting Pine Creek State Forest was made conditional on the development of a joint SFNSW/NPWS plan of management for koala conservation and timber production. An inquiry into gap and cluster silviculure (gap clearfelling) was also announced by the Minister for Land and Water Conservation.

From his study in Pine Creek State Forest (which was undertaken within a production forest with no areas of undisturbed forests for comparison) Smith (2004) considered that Koalas could persist in areas subject to selective logging but not intensive logging, commenting:

This result suggests that variation in koala scat abundance is best predicted by a combination of inter-related floristic, structural, and logging history variables. This gradient was interpreted to be one of increasing koala abundance with increasing tree stocking, increasing uneven-aged structure, increasing predominance of medium sized and mature stems, and increasing tree species richness, associated with a history of patchy and frequent low intensity selective logging and TSI.

...

Koalas appear to favour uneven-aged forests which have developed after a long history of low intensity, single tree or large diameter-limited harvesting. Koala scats were also most abundant in portions of compartments with few or no new stumps or no evidence of recent logging (within the last 10 years). This observation is consistent with the predictions by Smith et al. (1995) that koalas may require long periods (10-20 years) for population growth and recovery after displacement by moderate to intense logging because of their low reproductive potential

...

Creation and maintenance of koala habitat in production forest will require a new approach to harvesting and silviculture based on the low intensity, single tree selection and diameter limited harvesting practices more typical of those carried out in the past. Plantation development and creation of plantation-like structure in native forest is not compatible with maintenance of natural koala densities.

In 1997 Smith (2004) reports he put forward a number of management recommendations to State Forests for Pine Creek State Forest, involving a zoning based on Koala presence and:

A package of recommendations to sustain koala populations within production forests, including the setting of limits to timber yields, maintaining a minimum stocking of mature and older trees and feed trees, reservation of a minimum 15% of koala habitat in each logging compartment and harvesting at intervals of not less than 15 years in timber production zones,

State Forests subjected Smith's 1997 recommendations to unprecedented *"review, scrutiny and intensive criticism",* leading Smith (2004) to comment:

I concluded that SFNSW, at that time, was not an appropriate authority for independent review of threatened forest species research. It stood to benefit financially by finding reviewers that would reject findings that might constrain wood production.

...

Key recommendations for integration of koala conservation and wood, particularly the need to maintain the low intensity harvesting instead of Australian Group Selection and gap harvesting were rejected. Approximately 12 months later, dissatisfaction with the Pine Creek Koala Plan of Management and insensitivity in its implementation prompted the local community (Pine Creek Koala Support Group) and NEFA (North East Forest Alliance) to put

forward a proposal in 1998 to transfer the best koala habitat in Pine Creek to national park. This proposal was in large part adopted by the NSW Government in 2003 ...

... In my opinion, this result is almost entirely due to failure of SFNSW to reverse timber over supply commitments and adopt new, low intensity harvesting practices and minimum stocking standards that prevent over-cutting of natural forests and their conversion to tree farms.

In 1995 in response to community concerns NEFA exposed clearfelling by (then) State Forests of NSW of an area of known core Koala habitat in Pine Creek State Forest. A subsequent inspection by NPWS considered *"the evidence of high levels of koala activity is so abundant in the logged compartments that it could not have been missed by anyone genuinely searching for evidence of koalas".* Andrew Smith who had done the fauna assessment for the State Forests' Coffs Harbour Urunga Management Areas EIS, which excluded clearfelling from areas with koalas and koala feed trees under a protocol developed in consultation with the NSW National Parks and Wildlife Service, described it as "*the most destructive and intensive clearfelling that I have ever observed in a State Forest in northern NSW*". When as part of the 1997 *Pine Creek Koala Plan of Management* Smith put forward management recommendations "*for integration of koala conservation and wood*" in the forest they were attacked and rejected by State Forests.

The Forestry Corporation's refusal to implement agreements with the NPWS, and commitments of their own EIS, to survey for Koalas ahead of clearfelling operations in Pine Creek State Forest in 1995, and the subsequent clearing of Koala habitat, is testimony to the long-term nature of the organisation's contempt for the conservation of Koalas in NSW. Their subsequent refusal in 1997 to accept expert recommendations to modify their logging practices to reduce impacts on Koalas exemplifies the Forestry Corporation's blind obsession with obtaining timber irrespective of the environmental cost.

2.1.2. Forestry Case Study 2: Royal Camp State Forest

In July 2012 the Forestry Corporation maintained that they had undertaken the required Markup Survey (TSL 5.1., 5.2.1.) and Koala Markup Search (TSL 5.2.2) in Compartment 15 of Royal Camp State Forest and commenced logging. It was identified as an "intermediate use" area, and a Koala High Use Area had been identified in Compartment 14 the previous year (before a controlled burn got out of control and burned any evidence of Koala scats elsewhere in the logging area).

On NEFA's (Pugh 2012) initial audit of logging between 4th and 5th August 2012, not one Koala feed tree was found to be marked specifically for retention within Compartment 15, and in most areas the marked hollow-bearing and recruitment trees (which can double as Koala feed trees) were far too few and of the wrong species to satisfy this requirement. Marked trees were primarily in the vicinity of tracks and the boundary of exclusion areas, indicating that Mark-up Surveys had not been conducted throughout the logging area. Forests NSW had apparently made no effort to comply with the requirement to mark 10 primary browse trees per 2 ha.

NEFA (Pugh 2012) found abundant evidence of Koala use of feed trees in Compartment 15, such as distinctive scratch marks on the trunks of numerous trees, Koala faecal scats under many trees, and a sighting of a Koala when spotlighting. In our brief inspection NEFA located 4 areas that met the criteria for Koala High Use Areas. One area near log dump 20 was in the process of being logged, another near log dump 19 had been marked up for logging which was about to commence,

and the two others near log dump 25 were proposed for logging in the near future. The area being logged had logging extending into it on three sides, and almost the entire area was within 300m of log dump 20 and within 100m of active logging.

NEFA (Pugh 2012) also found significant scat evidence of Koalas, including some that appeared to be from a mother and baby, in the small part of compartment 16 inspected, identifying that this indicated further Koala high use areas. Subsequent checks by both the EPA and Forestry Corporation confirmed the presence of Koala High Use Areas in all the localities we had identified.

After our complaint, and while the EPA audit was supposedly underway, the Forestry Corporation burnt off substantial parts of the logged area of Compartment 15, thereby destroying the evidence of any remaining Koala scats in those areas and any further evidence of Licence breaches.

In total, with a follow-up assessment on 9th August, we located 23 trees with >20 scats beneath them within the Koala High Use Area being logged, including three with large and small scats indicating the presence of at least one mother and young, and 22 additional trees with 1-19 Koala scats beneath them. The range of ages of scats showed long-term usage until very recently. While the Forestry Corporation had identified no Koala high use trees on our first visit, by the 9 August they had marked at least 7 high use trees with >20 scats. Given that many of the scats were clearly visible on the surface it beggars belief that anybody could have even undertaken a cursory look and not seen any.

Logging resumed in compartment 16 on 9 August. On the 19 August NEFA inspected the eastern part of compartment 16, and located Koala scats under 20 trees, with three of these reduced to stumps in recent logging. More than 20 Koala scats were found under four trees and more than 50 under another. One Koala High Use Area was found to have had logging within it. Searching was limited by logging debris and ground disturbances. We thoroughly searched over 100 potential Koala feed trees and stumps for Koala faecal scats and saw no evidence that anyone else had previously searched in the long grass, leaves and bark around the bases of these trees before us (even trees marked as K trees and those with >20 scats). In the older logged area no Koala feed trees had been marked, though many Koala feed trees were marked in recently logged areas. Despite our findings logging continued.

On 23 September NEFA undertook an audit to the north-east of log dump 5 in compartment 16. Logging had been undertaken subsequent to our August 20 Audit Report. We searched a total of 103 preferred Koala feed trees (Grey Gums and Grey Box) for Koala scats. Scats were found under 16 trees, with two of these having >20 scats beneath them. The two high use trees had not apparently been identified before and had clearly not been subject to star searches. Our subsequent searches in this area revealed another Koala High Use Area that had logging undertaken around and within it. Of the 103 potential Koala feed trees we searched for scats only 7 had been obviously searched before.

The EPA found that 61 trees had been logged and 405m of snig tracks constructed in the koala high use exclusion zone that should have been imposed near log dump 20. In compartment 16 the EPA concluded that 7 trees were logged and 230m of snig tracks constructed within another Koala High Use Area near log dump 7, which had occurred after logging had resumed on 9 August. The EPA (2014b) later identified the problem as

> *The EPA identified the root cause of the breaches of the licence as the Forestry Corporation's failure to undertake searches for evidence of koala in compliance with the licence. The EPA considered that if searches are inadequate or not undertaken at all, the*

default protection provisions in the licence become ineffective. That is, if you don't look, you don't find and if you don't find, you don't protect.

Regional Forester Craig Busby (28/8/12, see Pugh 2014) told the EPA "*There are some grey areas in the licence about thoroughly doing the search. It is about what thoroughly means - our searches look under trees it doesn't say to get on your hands and knees and scrape the surface - it just says thoroughly*". Craig Busby's email to CEO Nick Roberts of 7 November 2012 stated (Pugh 2014):

We are still in dispute with EPA over the interpretation of "thoroughness" of searching and techniques used and are standing our ground based upon the fact that we have not changed our techniques since the introduction of the TSL.

In February 2013 the foresters responsible for the scat-searches and marking-up in Royal Camp told the EPA that they hadn't changed the way they searched for Koala scats and would not (Pugh 2014).

In April 2013 Regional Forester, Craig Busby, told the EPA that they had done the required pre-logging surveys and not done anything wrong, stating (Pugh 2014):

FCNSW marked up at least 300m in advance of harvesting operations right across the subject harvesting area ...Marking (including koala mark-up searches) in the vicinity of dump 20 took place around 16-18 July ...

... no triggers for star searches were found at the time of pre-harvest mark-up around log dump 20. ...The techniques for pre-harvest koala mark-up searches has been audited by the EPA many times since the introduction of the TSL. The EPA's current interpretation of the relevant TSL condition is inconsistent with historical practices.

... no features indicating a koala high use area were located in the vicinity of dump 20. ...Therefore FCNSW did not knowingly harvest within a high use area nor the associated 20m exclusion zone.

Despite the Forestry Corporation displaying no remorse or contrition, on 28 June 2013 the EPA issued FCNSW three penalty notices (and fines on $300 each) for contravening a threatened species license (TSL), including:

- undertaking specified forestry activities (timber harvesting) in koala high use areas - TSL 6.14(c)(i)
- undertaking specified forestry activities (timber harvesting) in koala high use exclusion zones - TSL 5.1(a)(i)
- failing to conduct a thorough search for, record and appropriately mark koala high use and intermediate use areas – TSL 5.2.1(a)(b)

The EPA informing the Forestry Corporation (Pugh 2014):

3. The EPA investigation identified significant breaches in contravention to the TSL. Specifically, EPA officers identified that:

a. Specified forestry activities including the felling of 61 trees in a koala high use exclusion zone and the construction and operation of snig track, an approximate length of 405m in a koala high use exclusion zone east of log dump 20, in compartment 15; and

b. Specified forestry activities including the construction and operation of snig tracks that crossed koala high use areas east of log dump 20, in compartment 15.

c. *FCNSW staff member responsible for the compartment mark up and koala searches did not conduct koala searches in certain areas in the compartment including part of the area that was subject to specified forestry activities in a koala high use area, east of log dump 20, in compartment 15.*

The EPA informing the Forestry Corporation (Pugh 2014):

> *3. The EPA investigation identified significant breaches in contravention to the TSL. Specifically, EPA officers identified that:*
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> > *Specified forestry activities including the felling of 61 trees in a koala high use exclusion zone and the construction and operation of snig track, an approximate length of 405m in a koala high use exclusion zone east of log dump 20, in compartment 15; and*
> >
> > *Specified forestry activities including the construction and operation of snig tracks that crossed koala high use areas east of log dump 20, in compartment 15.*
> >
> > *FCNSW staff member responsible for the compartment mark up and koala searches did not conduct koala searches in certain areas in the compartment including part of the area that was subject to specified forestry activities in a koala high use area, east of log dump 20, in compartment 15.*

The penalties were taken to be inconsequential by the Forestry Corporation and they continued to deny any wrongdoing or display any contrition. On 12 July 2013 ABC North Coast reported:

> *But regional manager Craig Busby says the breaches were administrative, and akin to staying too long in a parking lot.*
>
> *He says they involved the identification of koala droppings beneath trees.*
>
> *"The environmental interest groups were excavating koala scats, so it's an indication that they were there historically," Mr Busby said.*
>
> *"We know they were there historically, but largely we look for fresher scats on the surface and that's where the discrepancy is.*
>
> *"So we're working with the EPA to work out what the true definition of a koala high-use area is and we'll continue to do that.*
>
> *"I can understand that there's a perception in the community that ($300) would be a light sort of fine.*
>
> *"The reality is that the fines reflect the environmental outcome.*
>
> *"Look in terms of the fines, they're administrative, they're like staying in a parking lot for a little bit too long, but the reality is there has been no environmental harm to koalas in that area."*

While referring to Private Native Forestry, the comment by Prest (2003) is equally relevant to the Forestry Corporation:

> *Breaches of environmental law in the rural context are often perceived as minor or technical breaches. They are seen as neither criminal in nature nor morally reprehensible. Landholders may view environmental impacts as minor, unproven or as an unintended by-*

> *product of economically beneficial activities. In such a context, it is inherently difficult to secure high levels of voluntary compliance, particularly where that compliance would come at an economic cost to the landholder.*

At Royal Camp the Forestry Corporation had been logging for months in what was undoubtedly core Koala habitat before we stopped them. They were actively logging a Koala High Use Area, and about to log another 3 that we identified at the time. Over the preceding months there had been widespread removal of Koala feed trees, most likely within a number of Koala High Use Areas (the Forestry Corporation identified one such area to the EPA but they refused to inspect it (Pugh 2014)). The Forestry Corporation went on to log another 2 Koala High Use Areas (one of which the EPA refused to investigate). The reaction of the EPA was to treat this as a minor offence, with the only reaction amounting to a total of $900 in fines for a single Koala HUA. All other offences (Yellow-bellied Glider, habitat trees, stream crossings etc.) were forgiven, with many of our complaints (including ones shown to the EPA) not even investigated. With such lax enforcement it is no wonder that the Forestry Corporation considered the offences inconsequential, and went on to repeat them.

In 2013 NEFA became alarmed that the Forestry Corporation was proposing to commence logging in Compartment 13 of Royal Camp SF. The Forestry Corporation's draft Harvesting Plan identified "nil" Koalas. On 4 July 2013 NEFA inspected the area because of our concern that they may again log Koala High Use Areas. On one day we located 34 trees with Koala scats about their bases. Of these trees, 11 were found to be Koala high use trees on the basis that 10 had >20 Koala scats about their bases and another because it had scats of two different sizes, indicating the presence of a mother and young. Two Koala High Use Areas were identified.

Based on his inspections of Royal Camp State Forest for NEFA, wildlife expert David Milledge (NEFA 2014) concluded:*"The level of Koala activity revealed by these searches is amongst the highest I have recorded in my experience of over 20 years conducting Koala scat surveys in coastal and escarpment forests in north-eastern NSW. This highlights the significance of Royal Camp State Forest in supporting a dense local Koala population and possibly one of the most important on public land in the region".*

A subsequent inspection by the EPA (Aboud 24 July 2013) of the two Koala High Use Areas found on 4 July 2013 in compartment 13 by NEFA confirmed their presence and located abundant additional high use tree locations. Leading the EPA to conclude:

> *Based upon these findings and recent findings made from investigations undertaken in compartments 14, 15 and 16 of Royal Camp State Forest, the EPA considers these areas contain koala habitat and play an important role to Koala populations in the region. The EPA consider compartment 13 to have areas that indicate koala high use that is ongoing and contemporary.*

The then Minister for the Environment requested the EPA to determine the regional significance of the koala population, with the subsequent June 2014 report by Dr. Steve Phillips for the EPA finding a resident koala population within Royal Camp that *"should be considered important at all levels of assessment"* due to the koala populations of the encompassing Richmond Valley LGA being found to be *"endangered on the basis of international, national and state-based conservation criteria".*

In August 2014 the Forestry Corporation engaged Jim Shields to search for Koalas using a sniffer dog, they detected 14 Koalas at a mean density of 0.36/ha in 11 hours of searching.

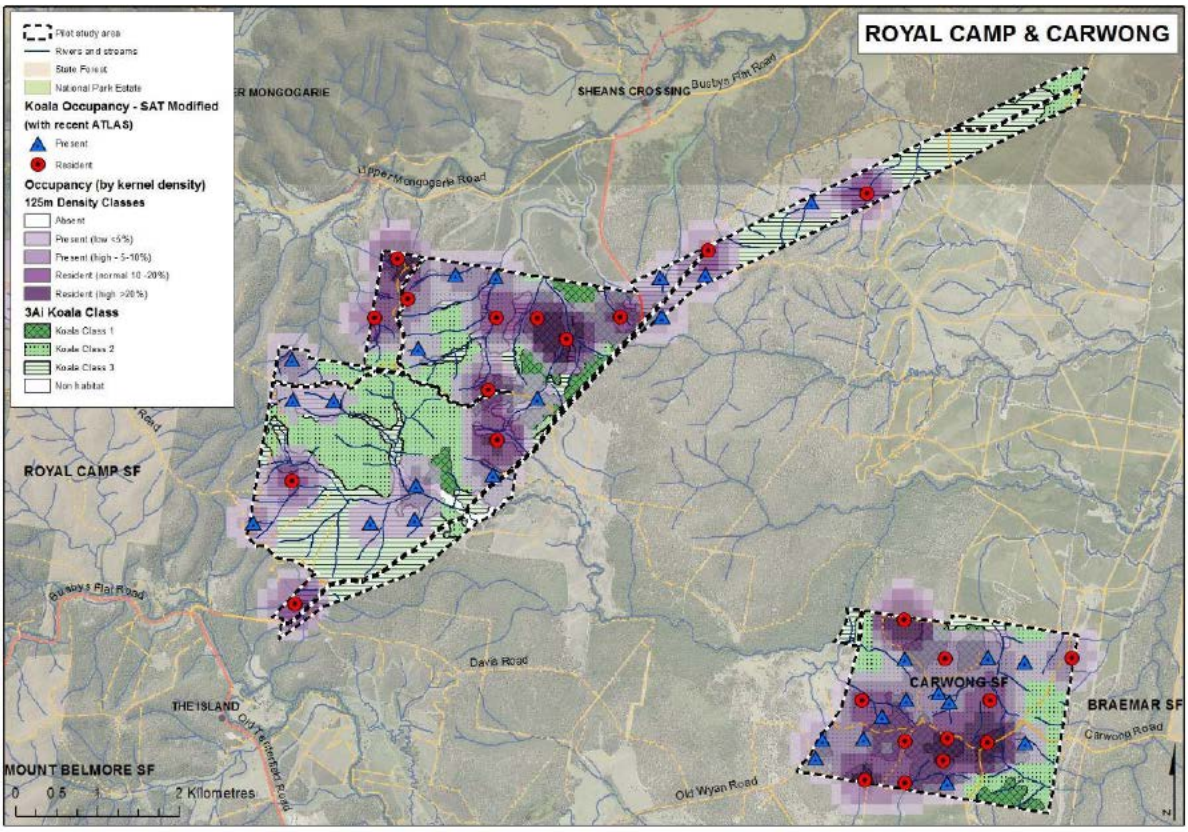
Based on Koala records, in November 2014 NEFA proposed the creation of the 2,100 ha Sandy Creek National Park, comprised of two parts, including part of Royal Camp State Forest (compartments 13-16, 1,500ha) and the whole of Carwong State Forest (600ha).

The EPA (2016) study of 4 key areas of State forests known to once have good Koala populations once again verified that Royal Camp and Carwong State Forests have significant populations of resident Koalas:

> *The activity results and Phillips' (2013) report both indicate that Royal Camp and Carwong state forests support extensive areas of koala occupancy and habitat utilisation, and that in compartment 13, at least 50% of the habitat is utilised and conforms to optimal utilisation of secondary habitat by a low density population. The project found that 80% of Carwong and 58% of Royal Camp State Forest is utilised, which supports Phillips' (2013) results. On this basis it can be concluded that habitat in Royal Camp and Carwong is source habitat, where reproduction exceeds mortality on average over time.* (p84)

It is further noted (p86):

> *In relative terms, Carwong appeared to be the least disturbed by logging and fire. Having both wildfire and multiple recent logging events absent for approximately 20 years, appears to correlate with overall highest occupancy compared with other pilot areas that have experienced multiple, more recent silviculture treatments. This result aligns with Smith's (2004) findings that koala prefer areas of least disturbance.*



Records and potential Koala habitat (based on Plant Community Type) identified by EPA (2016) for Sandy Creek National Park proposal.

It is important to recognise that a study of Koalas across the Richmond Valley LGA (Phillips and Weatherstone 2015) identified *"two "Important Populations" as defined for purposes of the Federal Government's Environmental Protection and Biodiversity Conservation Act 1999",* as "*key source populations for breeding and/or dispersal*", including "*Habitat to the north of Rappville in the general vicinity of Royal Camp and Carwong State Forests and associated lands".* They also found:

> *Extent of Occurrence of koalas across the RVLGA has remained relatively unchanged over time. However, further analyses of habitat occupancy rates has indicated a statistically significant decrease over the last 3 koala generations of ~33% in the amount of habitat actually being occupied by koalas. This trajectory, if left unchecked, will lead to increasing endangerment of the RVLGA's koala populations over coming years.*

It is clear to NEFA that Royal Camp and Carwong State Forests qualify as important Koala habitat in accordance with the Commonwealth's Conservation Strategy (Actions 1.02, 1.03, 1.04, 'Habitat Loss, Disturbance and Modification' actions) and NSW's Recovery Plan (Objective 1). Though it is clear that the Government's proposed changes to the IFOA will mean that these forests will no longer meet the criteria for protection (i.e. they are only modelled as high quality habitat in one model, rather than the 2 required) and will thus be opened up for logging.

The evidence now clearly proves that Royal Camp and Carwong State Forests support a State significant population of Koalas that should be protected in their entirety if the NSW Government has any genuine intent to arrest the decline of Koalas in NSW. The proposed Sandy Creek National Park is a litmus test of the NSW Government's commitment to Koala survival.

2.1.3. Forestry Case Study 3: Gibberagee State Forest

NEFA's 'Preliminary Audit of Gibberagee SF Compartments 104, 105, and 106' was provided to the Minister for the Environment and the Environment Protection Authority (EPA) on 12 February 2019, along with a request to stop the illegal logging continuing.

NEFA had found widespread Koala usage of Grey Gums, as shown by most Grey Gums having distinctive Koala scratches, demonstrating a widespread breeding colony of Koalas. It was also apparent that the required Koala Mark Up Searches were not being undertaken (breaches TSL 5.2.2 a, b), with no evidence of any of the trees inspected having been thoroughly searched for Koala scats. NEFA located one tree with >20 Koala scats indicating the presence of Koala High Use Areas that should have been searched for (breaches TSL 6.14 a (i)). We also found that the Forestry Corporation were not marking and retaining the 5 Koala feed trees required in Intermediate Koala Habitat (ie compartment 104) (breaches TSL 6.14 a (ii)).

There are records of a variety of threatened species requiring hollow-bearing trees for denning, nesting and roosting, including Barking Owl, Powerful Owl, Masked Owl, Glossy Black Cockatoo, Brown Treecreeper, Brush-tailed Phascogale, Yellow-bellied Glider and Squirrel Glider. Despite this. as identified in previous audits of Gibberagee SF, we found the Forestry Corporation were not retaining the required 5 hollow-bearing trees per hectare and logging hollow-bearing trees in contravention of TSL 5.6d. Hollow-bearing trees were being marked as recruitment (R) trees to reduce retention requirements (breaches TSL 5.6d i and ii). Similarly they were not retaining the required 5 sound and healthy mature recruitment trees per hectare, essential to be the future replacements as hollow bearing trees age and die, in contravention of TSL 5.6e. Defective, damaged, suppressed and small trees were selected as R trees (breaches TSL 5.6e iii and iv). Once again their reckless logging was resulting in significant damage to retained hollow-bearing and recruitment trees in contravention of TSL 5.6h.

In a 5.5ha area marked up for logging the legal requirement was to retain up to 28 hollow-bearing (H) trees and 28 recruitment trees, yet the Forestry Corporation had only marked for retention 16 hollow-bearing trees and 15 recruitment trees, 55% of those needed, despite adequate numbers being available to fully satisfy requirements. They had also rorted selection requirements by selecting hollow-bearing trees and defective and suppressed trees as recruitment trees.

Given the history of breaches within Gibberagee State Forest we had an action on the 13th February which was resolved when the Forestry Corporation agreed to a site inspection within a week with NEFA, and the EPA if they agreed, to inspect the breaches we had identified. The EPA declined a site inspection with us and a week later the Forestry Corporation reneged on their agreement.

The EPA did undertake an assessment on their own on 19 and 20 February 2019. Their investigation was hampered because many of the Grey Gums with obvious Koala scratches (and no evidence of searches) we had identified had since been logged, and because the Forestry Corporation had since covered up the evidence by remarking habitat trees we had audited. Without us to show them, the EPA claimed to have been unable to find or verify many breaches we had identified.

NEFA returned on Sunday 24 February to audit recent logging. This involved a detailed audit of approximately 6 ha logged since February 13 and random assessments of adjoining areas currently being logged. We found that that the Forestry Corporation were still refusing to comply with their

legal obligation to search for Koala scats and Koala High Use Areas ahead of logging, locating 3 Koala high use trees that had not been identified by the Forestry Corporation with >20 Koala scats (111, 21 and 42 scats) around their bases in areas that had been logged while the EPA were investigating.

We requested that the EPA issue a stop work order in accordance with the Biodiversity Conservation Act 2016 to stop this ongoing destruction of Koala habitat and the cover-up of breaches until their investigation is complete and the required protection for Koalas implemented. On 26 February 2019 we requested the Minister for the Environment to stop the ongoing breaches of the Threatened Species Licence (TSL) by immediately stopping works in compartments 104-6 of Gibberagee State Forest until:

1. The EPA completes its investigations of our complaints.
2. Koala Mark-up Searches are undertaken in accordance with TSL 5.2.2, Koala High Use Areas identified, and Koala feed trees marked for retention in accordance with TSL 6.14.

We wrote to Premier Gladys Berejiklian on 1 March 2019 asking her to intervene to stop the logging while there is an independent assessment using a scat detection dog to identify Koala High Use Areas.

We had another action at Gibberagee on 4 and 5 March to try and force pre-logging surveys for Koalas. To resolve the dispute we offered to fund a one day trial using a scat detection dog to identify Koala High Use Areas. We subsequently arranged to engage Reconeco's trained dog Jet to undertake an assessment. The Forestry Corporation refused our offer, though logging was stopped.

On the 17 March 2019 NEFA undertook further Koala scat searches in the most recently logged, and proposed logging areas, in compartment 104 of Gibberagee State Forest. Once again the vast majority of Grey Gums inspected had obvious Koala scratches and not a single Grey Gum showed any evidence (disturbance to leaf litter) of having been searched before us. We located 4 trees with Koala scats beneath them. Two more high use trees were identified, one with 32 Koala scats and one with 7 scats of different sizes indicating the presence of a mother and joey. Our offers to the EPA and Forestry Corporation to engage a scat detection dog were again refused.

In the end the Forestry Corporation protected a single hectare of this Koala high use area - only a fraction of one territory amongst a large population across the 467ha logging area. Because of the Koala High Use Area they did belatedly agree to abide by the requirement to retain 5 Koala feed trees per hectare elsewhere, and resumed logging Koala High Use Areas in May.

2.1.4. Forestry Case Study 4: Koala Hub Logging

In 2017 the Office of Environment and Heritage (OEH) analysed Koala records *"to delineate highly significant local scale areas of koala occupancy currently known for protection",* which they term Koala Hubs. Based on the data then available these are the known highest priority areas for Koala protection in NSW to increase their survival prospects.

Of the OEH mapped Koala Hubs in NSW, 35,656 ha (35%) occur on public lands. Some 19,785 ha (55%) of these are on State Forests. It is considered that greater survey effort in hinterland areas will significantly increase the number of Koala hubs identified and better delineate their extent.

Of the 19,785 ha of OEH Koala Hubs on State Forest: 11,849 ha (60%) are included in the Forest Management Zone (FMZ) 4 'General Management' which is the general logging zone, 340ha (1.7%)

in FMZ 3B 'Special Prescription' which is treated like the general logging area, 1,240 ha (6.3%) in Zone 5 'Hardwood Plantations' which are mostly clearfelled, and 6,280 ha (31.8%) is currently protected from logging in Zones 1, 2 and 3A. Though the protection may be short lived as the Government intends to remap currently protected oldgrowth and rainforest to make them available for logging.

Zoning of OEH Koala Hubs on NSW State Forests

FMZ	Area (ha)	%
Zone 1 - Special Protection Zone	3317	16.8
Zone 2 - Special Management Zone	1231	6.2
Zone 3A - Harvesting Exclusions Zone	1732	8.8
Zone 3B - Special Prescription Zone	340	1.7
Zone 4 - General Management Zone	11849	59.9
Zone 5 - Hardwood Plantations Zone	1240	6.3
Zone 6 - Softwood Plantations Zone	12	0.1
Zone 7 - Non Forestry Use Zone	63	0.3
Zone 8 - Areas for further assessment	1	0.0
Total	19785	

(Highlighted areas are available for logging)

There are 18,533 of Koala Hubs within native forests on State Forests in NSW, with 6,280 ha (34%) of this currently protected in zones from which logging is excluded, leaving 12,253 ha (66%) available for logging.

A NEFA (Pugh 2019) review of satellite imagery was undertaken. Within the OEH Koala Hubs the loggable areas (FMZ 4, some FMZ 3B) of compartments (or parts) were selected in Arcview where there was visual evidence on monthly Planet Explorer (www.planet.com) satellite images showing gross disturbance where logging had been undertaken. Light logging was not readily discernible.

It was found that of the OEH Koala Hubs on State forests in north-east NSW, 2,546 ha has been logged over the 4 year assessment period 2015-2018, which is an average of 636 ha logged per annum within Koala Hubs. It is assumed that some 430 ha of Koala hubs have so far been logged since they were identified. Many more are proposed for logging in current harvesting plans,

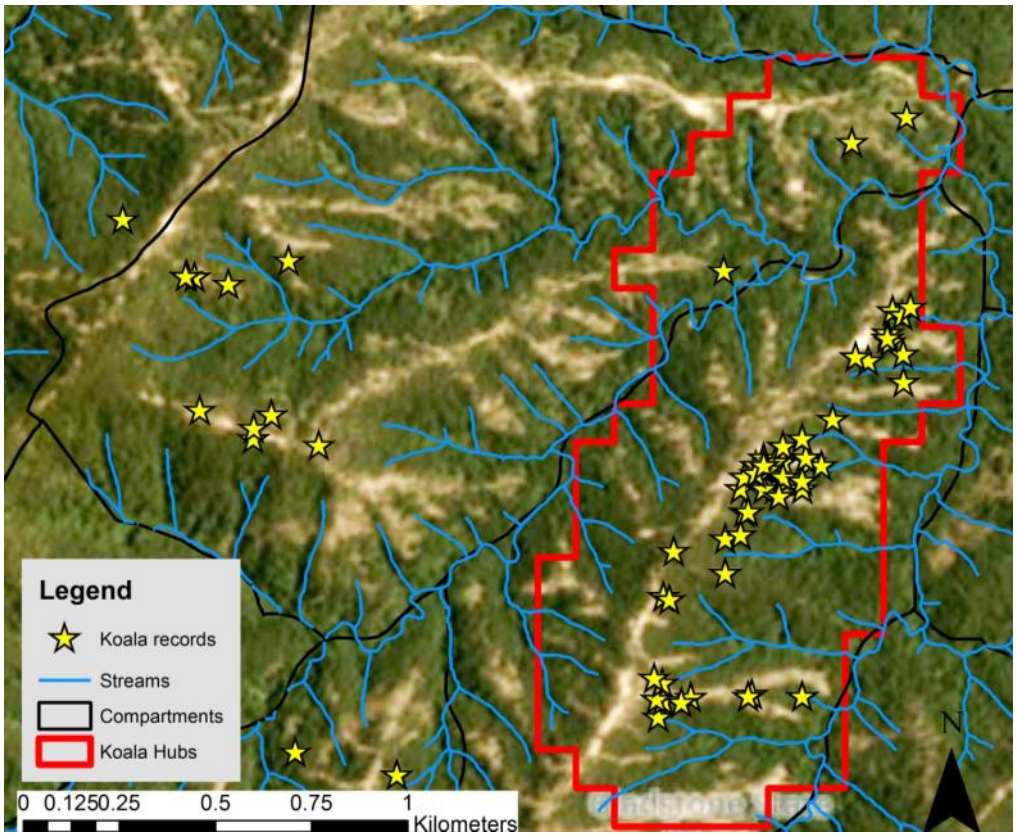
Areas of OEH Koala Hubs identified as logged over the 4 year period 2015 to 2018.

Year Logged	Hectares
2015	528
2015-16	75
2016	560
2016-17	364
2017	513
2017-18	150
2018	355
Grand Total	2546

Note that the data for 2015 are incomplete, and the 30ha shown as logged in January 2019 is incorporated into the 2018 data for reporting.

It can be assumed that some 430 ha of Koala hubs have so far been logged since they were identified. The harvesting plans available online show that extensive areas of Koala Hubs are proposed for logging this year.

This is most apparent with compartment 233 in Gladstone State Forest that was logged from February-August 2018 despite strong opposition from conservation groups who argued that it was important Koala habitat. The OEH Koala Hubs confirm that it was, and that this was known before it was logged.

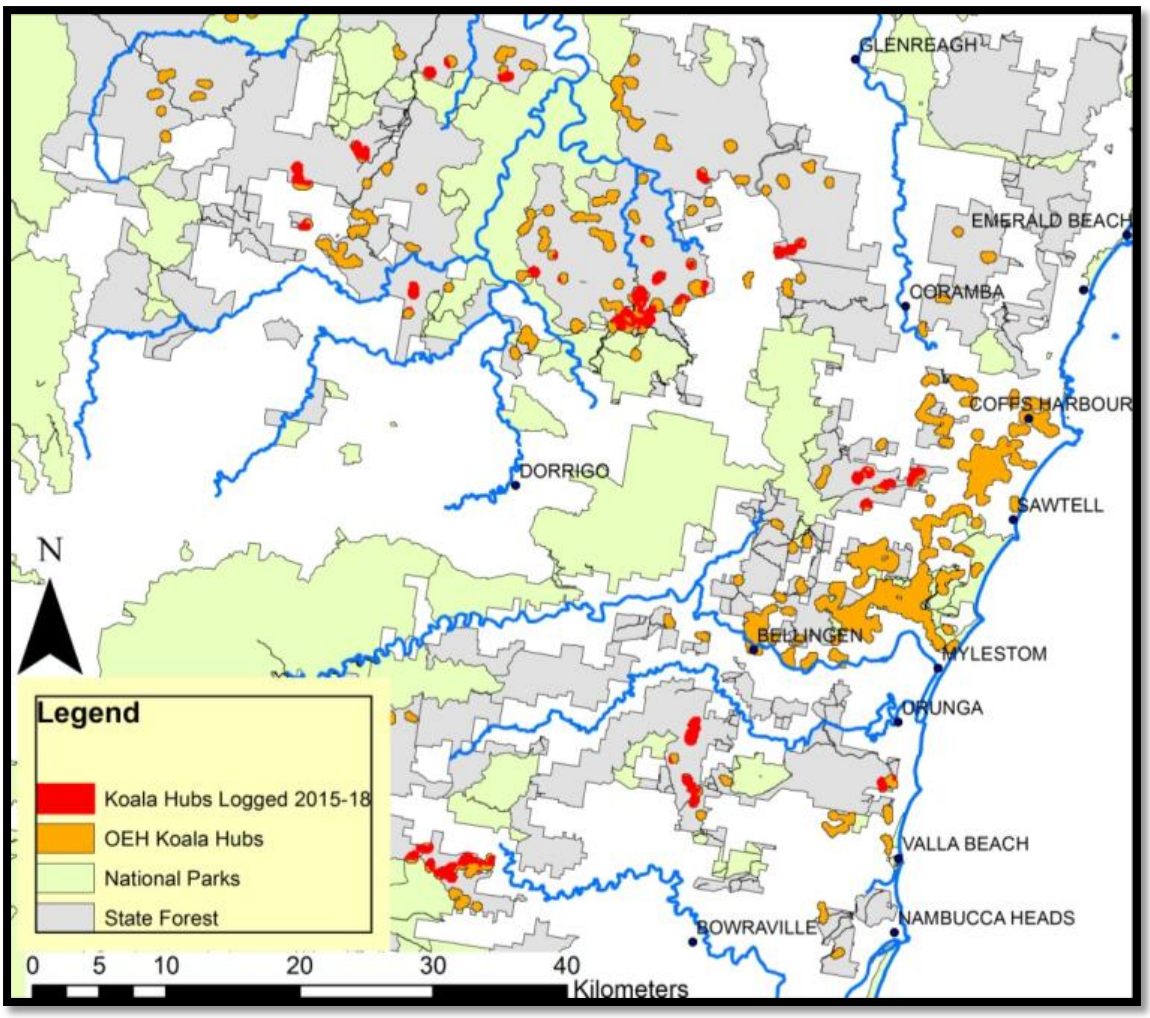


Gladstone State Forest, Compartments 231, 233. Logged June 2017-August 2018. Logging of Compartment 233 started in February 2018 after it had been identified as a Koala Hub and despite community opposition because of its obvious Koala values.

Outside exclusion zones and plantations there are 12,253 ha of Koala Hubs identified on State Forests, which means that over the past 4 years 21% of the loggable area of Koala Hubs within native forests on State Forests have been logged. Many of these have been logged well in excess of allowable logging intensities, with significant areas subjected to the unlawful logging practices of heavy and regeneration Single Tree Retention.

Of the 2,546 ha logged from 2015-2018, 1,283 ha (50%) has been modelled by DPI Forestry (Law *et. al.* 2017) as high quality Koala habitat and 574 ha (23%) as medium quality habitat. There are also 590 Koala records within the logged areas of the Koala Hubs. These confirm the importance of these areas for Koalas, and emphasise that this should have been well known to the Forestry Corporation before they logged them.

Over the period assessed logging intensity on State Forests was limited by the Integrated Forestry Operations Approval (IFOA). The IFOA (5) (3) is very specific in stating "*This approval applies only to logging operations where trees are selected for harvesting using Single Tree Selection or Australian Group Selection*".

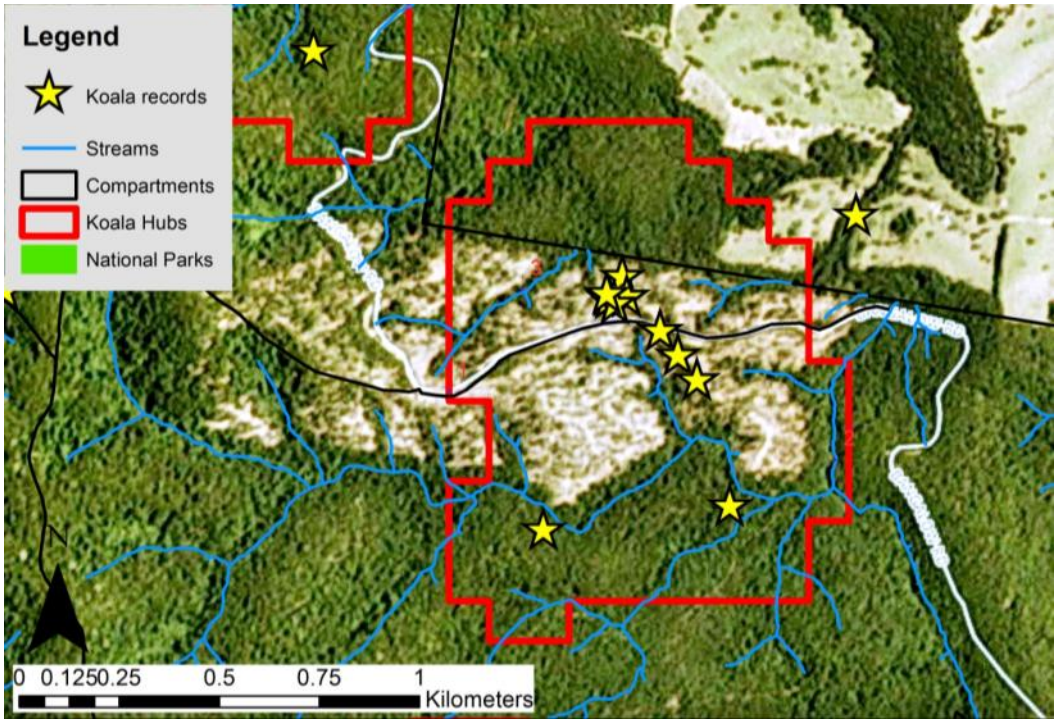


Example of mapping of logged Koala hubs.

Single Tree Selection (STS) is meant to be a relatively light logging regime that limits basal area removal to <40% and requires the retention of all trees under 20 cm diameter, outside exclusion areas. In 2007 the Forestry Corporation began practicing perversions of STS where they allowed themselves to remove up to 90% of the basal area over large swathes of forest. The NSW Minister for the Environment acknowledged, through a letter written by the Environment Protection Authority (EPA 2016) on his behalf, that this type of harvesting as "*practiced by the FCNSW, is not consistent with the definition and intent of STS (Single Tree Selection) in the Integrated Forestry Operations Approval (IFOA) as well as FCNSW's own silvicultural guidelines*."

In 2017 the North Coast Environment Council obtained data on the application of these unlawful logging regimes involving removal of 40-90% of the basal area, known as Medium, Heavy and Regeneration Single Tree Selection (STS). This data is limited to the Lower North East forestry region and only up until March 2017, so only provides a partial assessment. It is evident from Harvesting Plans that intensive logging of Koala Hubs is more widespread than indicated by these data.

Wang Wauk State Forest, Compartments 138, 145. Logged July-December 2018. Note the virtual clearfelling being undertaken under the guise of Single Tree Selection.



Over the period 2015 to March 2017 in the Lower North East forestry region, of these logged Koala hubs 22 ha is identified as being subject to the unlawful logging regimes of Regeneration Single Tree Retention (STS), 116 ha to heavy STS, and 348 ha to medium STS. It is evident from Harvesting Plans that intensive logging of Koala Hubs is more widespread than indicated by these figures, which is also shown by satellite images. This shows that many of these Koala Hubs, and surrounding areas, were subject to more intensive logging than the logging rules allowed.

It is essential for the future of Koalas that a moratorium be immediately placed on all remaining OEH Koala Hubs on State Forests, along with potential habitat within one kilometre, while further ground based assessments are undertaken to delineate the full extent these "*highly significant*" resident populations which, based on current records, are the highest priority for protection on public lands.

2.2. Private Forestry Case Studies

2.2.1. Private Case Study 1: Whian Whian private forestry.

NEFA (Pugh 2014) became involved with logging of a private property at Whian Whian (adjacent to the Nightcap National Park) when neighbours tried to have their concerns regarding Koalas addressed. The operation was undertaken by the same Forestry Corporation staff who oversaw logging operations in Royal Camp SF. The forester in charge of the operation, Matt Kinny, had previously accompanied EPA on their searches for Koala scats in August 2012 and July 2013 during EPA investigations of NEFA's reported Koala High Use Areas in compartments 15 and13 of Royal Camp SF.

Discussions with Forestry Corporation on 14 September 2013 revealed that they had found evidence of Koalas on the property and were thus applying the Private Native Forestry Code of Practice requirement to retain 10 primary koala food trees and 5 secondary koala food trees per

hectare. Forestry Corporation said that to achieve this they were basically excluding most Tallowwoods from logging, with only “a few” proposed for removal. They also stated that they had found 2 Koala high use trees (ie with ≥20 Koala scats under them). For Koala high use trees the Code requires:

> *Any tree containing a koala, or any tree beneath which 20 or more koala faecal pellets (scats) are found must be retained, and an exclusion zone of 20 metres must be implemented around each retained tree.*

Concerns that this property is of exceptional value for Koalas and that Koala’s were not being adequately protected were highlighted by a brief assessment by NEFA of trees in the vicinity of the boundary on 14 September which located 5 Koala high use trees, none of which had apparently previously been searched. One of the Koala high use trees found had not been previously searched despite having a new road constructed right next to it. The scats at the base of the tree were shown to the Forestry Corporation on the day and to the EPA the next week, though both agencies refused to accept the evidence we showed them.

Tree found to be Koala high use tree on 14 September (Tallowwood to left of rd), scats shown to FC and EPA, still not accepted as a high use tree and not buffered.

When NEFA (Pugh 2014) learned that the Forestry Corporation were proposing to construct a new road we surveyed the marked route and identified that it passed through, and within 20m of, 8 Koala high use trees (>20 scats), over 60 vulnerable Red Bopple Nut *Hicksbeachia pinnatifolia,* and 3 endangered Slender Marsdenia *Marsdenia longiloba.* NEFA wrote to the EPA on the 22 September 2013 to request the immediate and urgent imposition of a Stop Work Order in accordance with Section 37 of the Native Vegetation Act 2003.

The EPA sent a team in to oversee the Forestry Corporation, though refused to stop work. They EPA did not bother to check NEFA’s records, yet spent 2 days wandering around the proposed route with the Forestry Corporation while they identified a new route.

The EPA team had been transferred from the North Coast Regional Office of DLWC that over a decade earlier Prest (2003) described as having a "*laissez-faire stance of allowing self-assessment ...At its worst, this involved turning a blind eye to the impact of logging under exemption*", which he likened to a "*scenario of 'negotiated non-compliance', a term invented ... to explain where regulator and regulatee come to an unspoken agreement not to apply the legislation to the letter*".

Three days after our request for a Stop Work Order the new track was constructed. Subsequent inspections by NEFA (with botanists) found that the track had been illegally constructed through what should have been 20m exclusion zones for 3 Koala high use trees, 7 endangered Slender Marsdenia, 12 vulnerable Arrow-head Vines, and 8 vulnerable Red Bopple Nuts, most of which had been identified and tagged with pink tape (by either NEFA or the Forestry Corporation) prior to track construction. One of the Koala high use trees that had been identified by the Forestry Corporation in the presence of the EPA had the track constructed within 15m and debris within 12m without its exclusion boundary being marked, one 3.2m from the track had been checked by the Forestry Corporation in the presence of the EPA but had not been identified despite subsequent inspections showing abundant scats, and one had been identified by NEFA but could not be subsequently verified due to scats being removed. Two Slender Marsdenia were killed, one injured and 3 are missing. One Arrow-head Vine later died.

Over the course of events NEFA (Pugh 2014) found and reported a total of 16 Koala high use trees with 20 or more Koala scats beneath them. The Community Surveys of the weekend of 27-29 September found an additional 10 Koala high use trees with limited searching, bringing the total to 26 such trees in an area where the Forestry Corporation had only identified 2. A total of 8 Koala high use trees (and numerous threatened plants) were found to have had roads and tracks constructed within 20m of them.

This large number of high use trees proves that there is an active breeding Koala colony on the property, with evidence of males, females and young, that largely escaped the attention of the Forestry Corporation. There can be no doubt that the property constituted high quality core Koala Habitat but the EPA didn't care.

Aside from their incidental sighting of the 2 Koala high use trees, the Forestry Corporation had undertaken no survey for threatened plants or animals on the property despite it being in next to the Nightcap National Park in one of Australia's recognised biodiversity hotspots with numerous threatened species recorded in the vicinity. With all their experience the Forestry Corporation would have been well aware that there were a large variety of Threatened Species Conservation Act listed threatened plants and animals that were likely to occur on the property, just as NEFA were.

Over the course of events, in addition to Koalas, without undertaking comprehensive surveys NEFA and the community (Pugh 2014) identified the presence on the property of two Endangered species, eight Vulnerable species and the Endangered Ecological Community Lowland Subtropical Rainforest. The TSC Act listed species were: the Vulnerable animals Marbled Frogmouth, Sooty Owl, Masked Owl, Alberts Lyrebird and Pouched Frog; the Endangered plants *Endiandra muelleri* ssp. *Bracteata* and *Marsdenia longiloba;* and the Vulnerable plants *Corokia whiteana*, *Hicksbeachia pinnatifolia* and *Tinospora tinosporoides*.

All these species (aside from Pouched Frog) are identified in the Private Native Forestry Code of Practice as requiring exclusion areas or increased tree retention. Disgustingly, the Forestry Corporation, a public entity, were taking advantage of the basic premise of the PNF Code that the prescriptions aimed at reducing logging impacts on select threatened species are only activated where there is a “record” or “site evidence” of the species. Given the PNF Code has no survey requirements the Forestry Corporation was operating on the basis that they would not look before they logged, presumably because they did not want to apply the required prescriptions to reduce impacts on threatened species.

Even after we engaged a recognised expert who identified 3 records of Marbled Frogmouth, and one each of Masked Owl and Sooty Owl on the property, and requested the Ministers to intervene, the Forestry Corporation refused to implement the required prescriptions until grudgingly forced to days later by a community blockade. The Forestry Corporation argued they did not have to implement the PNF prescriptions because our expert records were not on Wildlife Atlas and thus did not constitute a "record" in accordance with the PNF Code.

Similarly both the Forestry Corporation and the EPA refused to accept or recognise NEFA's records of Koala High Use trees, despite the fact that our previous records in Royal Camp SF had been verified by both agencies. The foresters we had exposed at Royal Camp were accusing us of moving Koala scats, from as far away as Coffs Harbour. It was plain to see, for anybody who bothered to look, that there were plenty of fresh scats and it was obviously high quality core Koala habitat.

There was a 2 year window of opportunity for the EPA to legally pursue this matter, and they used most of this time up before they issued the Forestry Corporation with two Penalty Notices (each with a fine of $5,500) on the 11 September 2015 for constructing their track through what should have been 20m exclusion zones for a Koala High Use Tree and the Endangered vine Slender Marsdenia.

They were issued an Official Caution for violating buffers of 4 Red Bopple Nuts, with violations of 6 Arrow-head Vine buffers noted. This is half the breaches documented by NEFA.

The Forestry Corporation stated they intended to vigorously dispute the fines on the grounds that their intent *"was discussed with EPA staff on site during the operation".* In other words, the EPA knew they were going to construct the illegal road and, at best, did nothing to stop them.

Given that the EPA had almost used up their 2 years for legal action, the Forestry Corporation simply bided their time before telling the EPA that they would not pay the fines and would rather dispute them in court. By then, the EPA claim, it was too late to defend the fines in court. Given the EPA's complicity in the construction of the illegal road it is no wonder they waited so long to take action so that they could avoid court.

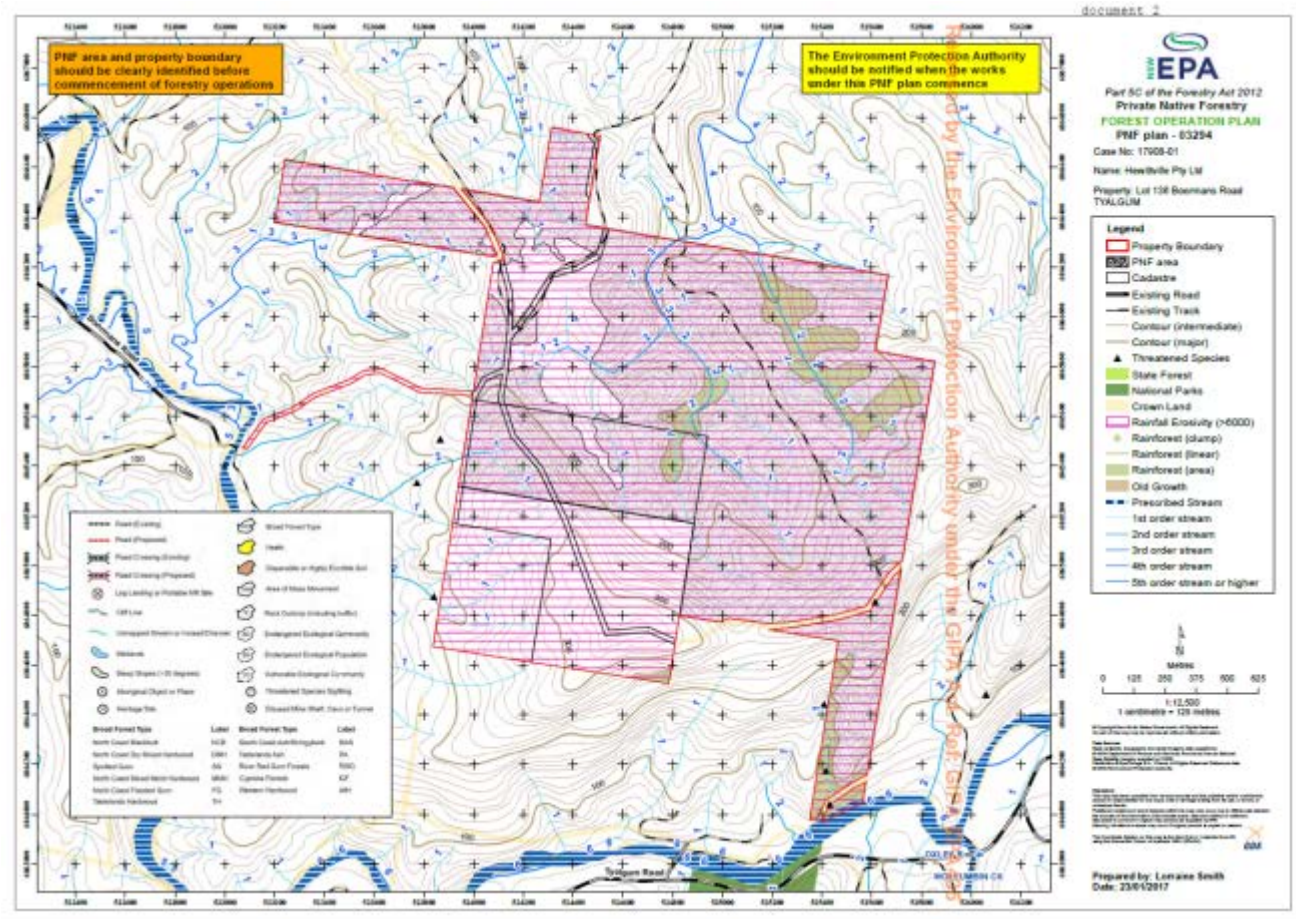
The private property at Whian Whian contains a breeding colony of Koalas and is undoubtedly high quality core Koala habitat. In 2013 the Forestry Corporation commenced logging, generating strong community opposition from their heavy handed approach. Where the Forestry Corporation identified two Koala high use trees, NEFA and the community identified 26 Koala high use trees, along with two Endangered species, eight other Vulnerable species and the Endangered Ecological Community Lowland Subtropical Rainforest, most of which required protection under the Private Native Forestry Code of Practice.

It took immense community effort and angst to get Koalas, and other species, the protection they were entitled to.

2.2.1. Private Case Study 2: Tyalgum private forestry.

The Environment Protection Authority issued a Property Vegetation Plan (PVP) for part of a property at Tyalgum on 29 April 2013. The contents of that plan and the subsequent Forest Operation Plan (FOP) were not made available to the public and Tweed Shire Council, as the EPA treat them as secret. Those parts of the property covered by the PVP and FOP are treated as confidential. The only information publicly available is the location of the property and the date the PVP was issued for some or all of it.

The Forest Operation Plan was recently obtained under a freedom of information request. It is revealing that it was prepared on 23 January 2017, though roading began in the PNF area in 2013, and logging began in 2016. The plan identifies the PVP property boundary (which includes the Boormans Road access) and the subset of the property that is covered by the FOP (black stippling). It is an inept and shoddy plan.



Forest Operation Plan (obtained under GI(PA) request) for a property at Tyalgum. Note that the only identified features are mapped rainforest and stream orders. It is a token plan. It is revealing that while the key claims to identify Endangered Ecological Communities it fails to recognise that the rainforest is the Endangered Ecological Community Lowland Rainforest, which is likely to be more extensive than mapped. Also the key claims to identify proposed roads, proposed road crossings, log landings, broad forest types, Aboriginal objects or places, Heritage sites, areas of mass movement, dispersible or highly erodible soils, rock outcrops, threatened species records etc, though none are shown. It's not that they don't occur, but rather that the EPA didn't bother to identify them, even those readily identifiable from existing information. It is a total failure of process that even proposed roads and creek crossings are not identified, which had significant consequences. Similarly Tweed Shire Council's Environmental Zones are not delineated, which also had significant consequences. It is no wonder that the EPA want to keep their inept shoddy plans secret.

Road and clearing works began sometime after August 2013 in both the PVP area and other parts of the property. There followed a protracted process involving construction of unapproved access roads on Crown Road Reserves, significant and ongoing pollution of a creek and Hopping Dicks Creek, clearing of riparian vegetation, and bureaucratic buck passing.

In April 2014 Tweed Shire Council issued the landowner with 2 x $1500 PINs, one for filling in the stream and a dam for a house pad on lot 127 and one for pollution of Hopping Dicks Creek,

considered Class 5 proceedings in NSW Land and Environment Court and issued a Clean Up Notice for stream pollution.

On 7 August 2014 Tweed Shire Council voted in favour of taking legal action, though dropped the case in July 2015 on the grounds of staff advice that "*it was very difficult for council to revisit compliance actions against the developer given the state agencies had signed off of the clean-up notices*". Mayor Bagnall was reported as stating "*any reasonable person*" could see the clean-up was inadequate as "*there's still a metre of mud there*", "*This (developer) is getting off scot free despite the destruction of the landscape, we're talking half a great big hillside he's moved and pushed into the creek*", and "'*If I did that, council staff would be onto me in five minutes, yet this guy just walks scot free, despite those works going on for six months*".

For the second time in March 2017 the landowner cleared vegetation and constructed another access road on a Crown Road Reserve to the north-west without consent, this time through 3 neighbour's properties as well as into the PVP area. This is still subject to the legal process.

In May 2017 an EPA inspection found unstable creek crossings and poor snig track drainage within the logging area, issuing a requirement to rectify them on 24 May 2017. Following another inspection, on the 4 August 2017 the EPA issued another Corrective Action Request requiring installing drainage on snig tracks, rehabilitating and stabilising 4 stream crossings, installing effective road drainage, removing tree debris from riparian exclusion zone, and removing or stabilising soil deposits within riparian exclusion zone.


Tallowwood with 23 scats beneath it from mother and baby subject to roadworks, such trees are meant to be protected by 20m buffers, but only if they are found. As there is no requirement to look before they log there is effectively no protection for such key feed trees.

Following requests from locals in September 2017 NEFA decided to undertake an initial assessment of the property for threatened fauna from the Crown Road Reserve that runs through it. In our limited survey we identified the presence of Masked Owl and Marbled Frogmouths on the

property through playback of their calls from the road reserve, and the presence of 2 Koala High Use Trees from scats.

Our brief inspection was the first to identify any threatened species on the property, and triggered requirements for the relevant prescriptions to be applied. For these species the PNF Code requires stream exclusions to be increased by 10m on first and second order streams for Marbled Frogmouths throughout the logging area, for an additional 10 of the largest trees to be retained per 2 hectares within 1km of the Masked Owl, retention of 10 primary Koala food trees and 5 secondary Koala food trees per hectare, and 20m buffers to be placed around the 2 Koala high use trees we identified (from our tiny sample).

None of the roadworks inspected by NEFA appeared to be appropriately drained in contravention of the PNF Code. For example the 250m road from a stream crossing to the top of the slope only had one side drain and yet soil has been bulldozed into a bank preventing water egress, A snig track on a 23^{o} slope was observed to have no cross banks.

During the course of the assessment it became obvious that extensive logging and roadworks had been undertaken in the Tweed Shire Council's Zone 7(d) Environmental Protection (Scenic/Escarpment) and 7(l) Environmental Protection (Habitat), despite the landholder having no consent to do so. Subsequent assessment of aerial photographs identified that some 18ha of the 7(d) and 7(l) Environmental Zones had been logged.

In response to our complaint in September 2017 the EPA identified "alleged" breaches of 5 conditions of the PNF Code with trees felled across streams in multiple locations, a log dump constructed too close to a stream, 5 inadequately drained snig tracks and some 1.2 km of the main access road inadequately drained. They failed to provide any details as to the number of breaches. Though they outrageously and unjustifiably claimed that "*there was no harm to the environment*" and only gave "*formal warning*" letters to the landowner and contractor, while issuing another Corrective Action Request.

The EPA also confirmed the two Koala high use trees and said the records of Marbled Frogmouth and Masked Owl would be taken into account in the future. Though as they were not "known" at the time of the logging no enforcement action was taken or possible. Our request to the EPA to ensure that surveys for Koala High Use Trees for application of the 20m buffer were in vain as the PNF Code does not require surveys.

At its meeting of 21 September 2017 Council unanimously resolved that:

> *1. Council engages its solicitors to provide advice regarding the unauthorised forestry and road works within that portion of Lot 136 DP DP755724 Boormans Road, Tyalgum affected by Tweed Local Environmental Plan 2000 environmental zones, as identified in this report, and that a further report be submitted to Council providing preferred options for prosecution of the site owners, and best options to impose a statutory stop work order under the Environmental Planning and Assessment Act 1979 and* ***a Clean Up Notice under*** *the Protection of the Environment Operations Act 1997;*
>
> *2. Council endorse that a systematic site assessment be undertaken to inform any investigation and compliance action including:*
>
> *a. Survey all constructed roads via vehicle traverse with differential GPS;*
>
> *b. Survey the aerial extent and location of all areas of vegetation clearing;*

c. Assessment by a suitably qualified ecologist to quantify the vegetation classification of areas impacted by vegetation clearing; and

d. Assessment by a suitably qualified ecologist of the quantified extent of vegetation clearing in relation to the impacts of the clearing on threatened species and threatened species habitat.

3. Council officers continue to work with relevant State and Federal Government compliance agencies to seek a prosecution of the site owners under their legislation and appropriate site management.

4. Subject to the advice in 1 above the Stop Work Notice and the Clean Up Notice may be issued by the General Manager or delegate without the need for a further report to Council.

5. Council requests in the strongest terms and makes representations in person to the state government to revoke this Private Native Forestry licence due to the significant impacts for Tweed's World Heritage values, threatened species, waterway pollution, safety issues with the instability of the works for compliance officers and on site workers, the unsuitability of the external road network, the significant costs of the extensive compliance actions required, the distress caused in the community, and the ongoing risks of further compliances breaches as evidenced by the significance and similarity of these repeat offences.

Despite having approved a PVP and subsequent Forest Operation Plan that proposed logging of the Environmental Zones (without identifying them), and refusing to provide their approved PVP and FOP to Tweed Shire Council, the EPA (Bryce Gorham 14 February 2018) denied any responsibility for the logging and roading in the Environmental Zones, stating:

> The EPA is aware that Tweed Shire Council is considering matters relating to the requirements of the Environmental Protection Zone (EPZ) on the property. As previously advised, the EPA has no jurisdiction in relation to such matters. Similarly, the EPA has no jurisdiction on Crown road reserves, these are administered by Department of Primary Industries - Lands. Our investigation has not considered any allegations related to the EPZ or Crown roads.

A community assessment in December 2017 identified a rainforest stand as qualifying as the Endangered Ecological Community Lowland Rainforest, with 14 Vulnerable Durobby (*Syzygium moorei*) and a number of Endangered Green-leaved rose walnut (*Endiandra muelleri* subsp.*bracteata*) within or near it. While their report was provided to the EPA (with localities) because it was anonymous and the localities not entered into wildlife atlas, nothing will be done to protect these threatened species.

Most concerning, some 3 months after NEFA's complaints, they identified that the required drainage had still not been adequately implemented on part of the main access road and that significant erosion was occurring, polluting the creek through the rainforest.

Erosion of main access track identified by the community 3 months after the EPA inspection failed to identify any problems in this area, it took the EPA another 2 months to request remediation and even then there was no timeline identified.

The EPA again decided not to take regulatory action and on the 23 February 2018 the EPA issued another Corrective Action Request for an area they did not bother to check on September 2017, this time requiring removing soil below a drain outlet and installing sediment control fencing, repair of two drains and the installation of an unspecified number of additional drains on a section of road. These works only had to be done "*as soon as practicable*".

Once again the community had to do the EPA's job, unfortunately the road had been left to erode for a further 5 months because of the EPA's refusal to undertake a comprehensive assessment back in September. Even then the EPA saw no urgency to repair it.

The obvious problem is that the EPA's inconsequential responses time and time again obviously failed to act as a deterrent. It is apparent that had effective action been taken early on then most of the subsequent breaches could have been avoided. The EPA are asleep at the wheel.

Taken together the triggering of prescriptions for threatened species significantly increased (at least theoretically) the protection provided for Koalas on the site, though there should have been an initial assessment to identify their presence at the planning stage.

2.3. Council Case Studies

2.3.1. Council Case Study 1: West Byron urban development

On the outskirts of Byron Bay there is an area of cleared paddocks and bush, including a caravan park and scattered buildings known as West Byron. Since 2004 Byron Shire Council's Biodiversity Conservation Strategy has identified primary Koala habitat as occurring on the property and classified the remnant native vegetation as High Conservation Value Native Vegetation. It is clearly core Koala habitat.

The Far North Coast Regional Strategy (DoP 2006) was released in 2006. It requires that Council prepares a *Local Growth Management Strategy* to identify how best to meet its dwelling targets. This is required to address urban and rural settlement, as well as commercial, retail, industrial and tourism development, and detail through 10 year staging programs and 5 year priority areas how its dwelling target will be achieved.

One of the identified environmental challenges of the 2006 Regional Strategy is to:

> • *improve protection and enhancement of environmental assets (including wetlands, littoral rainforest, koala habitat, and estuaries), biodiversity and landscape values*

The Regional Strategy requires that proposals satisfy the Sustainability Criteria, which include:

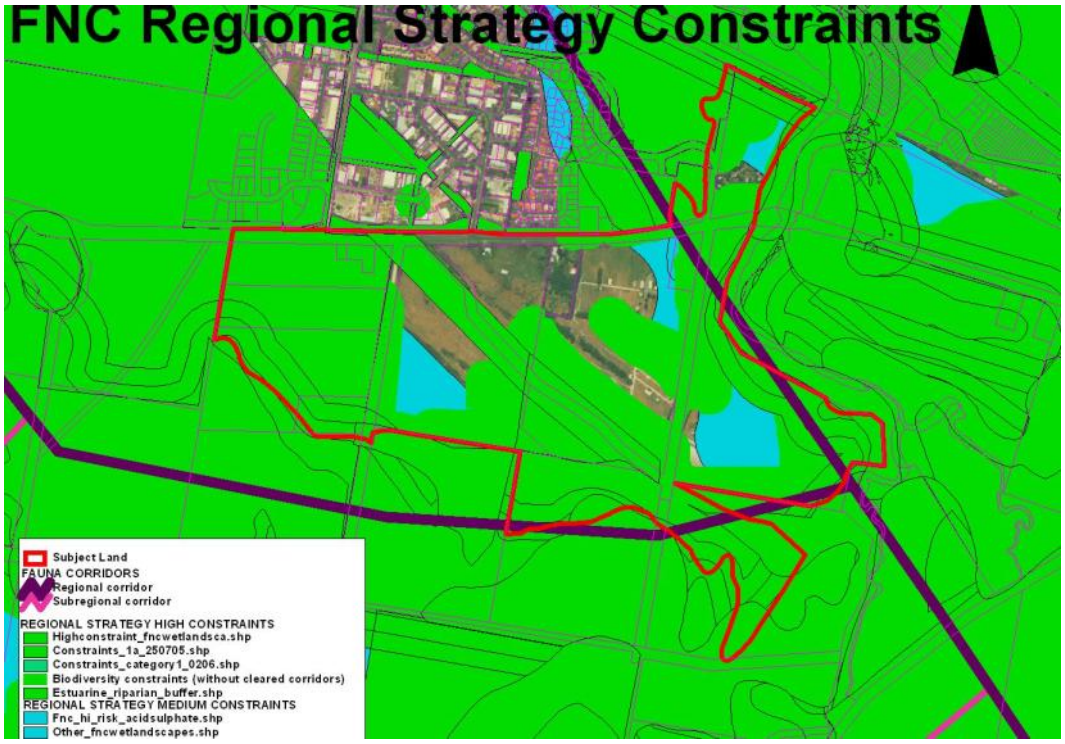
> *Consistent with government-approved Regional Conservation Plan (if available). Maintains or improves areas of regionally significant terrestrial and aquatic biodiversity (as mapped and agreed by DEC). This includes regionally significant vegetation communities, critical habitat, threatened species, populations, ecological communities and their habitats.*

Relevant actions identified in the 2007 Regional Strategy include

> • A Regional Conservation Plan prepared by the Department of Environment and Conservation will guide local councils in implementing conservation outcomes.

• Local environmental plans will protect and zone land with **State or regional environmental**, agricultural, **vegetation, habitat, waterway, wetland** or coastline values.

For town growth areas the strategy states that "*Land that is subject to significant natural hazards and/or environmental constraints will be excluded from development*".



West Byron example of the Regional Strategies identified and mapped "*Far North Coast NSW – Constraints 1a – Land quarantined by legislation, defined policies or registers*", which was identified because "*This constraints layer is derived from a number of datasets which exclude the possibility of development on legal grounds or by govt. policy*".

The associated 2007 Settlement Planning Guidelines state:

5. Future development should avoid areas of environmental significance, significant natural and/or economic resource, potential hazard, high landscape or cultural heritage value, or potential increased risk associated with impacts of climate change.

6. Future development adjoining land with the above values should incorporate buffers as necessary to help protect those values and to avoid future land use conflict.

The 2007 Settlement Planning Guidelines' **"Schedule 1. Application of regional mapping data"** provides the guidelines for application of the regional mapping of high and medium risk areas:

Step 2 – avoid impacts and hazards

1. High Risk

Planning principle: settlement should not be located in areas of high risk of environmental impact or hazard.

Development should be directed to unconstrained land(s) within the release area. In the occasional and justifiable circumstance where part of a proposal will be located on land identified as high risk because of the presence of biodiversity values, natural hazard impacts or other physical limitations, the development must be planned to minimise these impacts and provide appropriate offsets. These may include protecting and enhancing the long term

viability of priority vegetation and/or rehabilitating degraded priority areas. Justification of this approach should be based on social and economic grounds.

2. Medium Risk
Planning principle: settlement should avoid areas of medium risk of environmental impact or hazard wherever possible. The majority of the development should be directed to the least constrained land within the release area.

In the justifiable circumstance where this cannot be achieved appropriate mitigating and compensatory actions will be required to be incorporated at the relevant stage in the planning process,

The Byron Environmental and Conservation Organisation (BEACON) welcomed the strategy because of its environmental commitments, though principally because the preparation of a Growth Management Strategy would give the community the chance to have a say on how best to meet Byron's dwelling targets.

The Strategy also included a potential new urban release area at West Byron that was added to the strategy late in the process. BEACON strived to convince both the Council and the Department of Planning that a growth strategy was needed before any major residential developments, such as West Byron, were considered. For West Byron the Department of Planning said they would not require the preparation of a Growth Management Strategy and instead rely upon a discredited 1993 Byron Residential Development Strategy (which had been effectively abandoned) and pressured Byron Council to include West Byron in their new Local Environment Plan, saying that DoP would '*do whatever it can to assist in this process'.*

In October 2009, the Minister for Planning gave notice that she had accepted that a 108ha West Byron site on the western outskirts of Byron Bay was a potential State Significant Site under the *State Environmental Planning Policy (Major Development) 2005.* She considered that it was of "*regional environmental planning significance*" because it was "*identified for potential urban development under the Far North Coast Regional Strategy*" and would "*contribute towards alleviating pressures on housing supply and affordability within the region*".

The Department of Planning and their Minister justified taking decisions on West Byron off Council on the basis that it was State Significant Development, claiming that they had to intervene because Byron had a significant housing supply crisis. They ignored the fact that at the time Byron was the only Local Government Area in the region to be meeting its housing targets, approving housing at twice the rate required by the regional strategy. DoP's own figures proved there was no housing supply crisis, though they were not going to let the facts get in the way of their intent.

The Far North Coast Regional Conservation Plan (DECCW 2010) was belatedly released in 2010 stating:

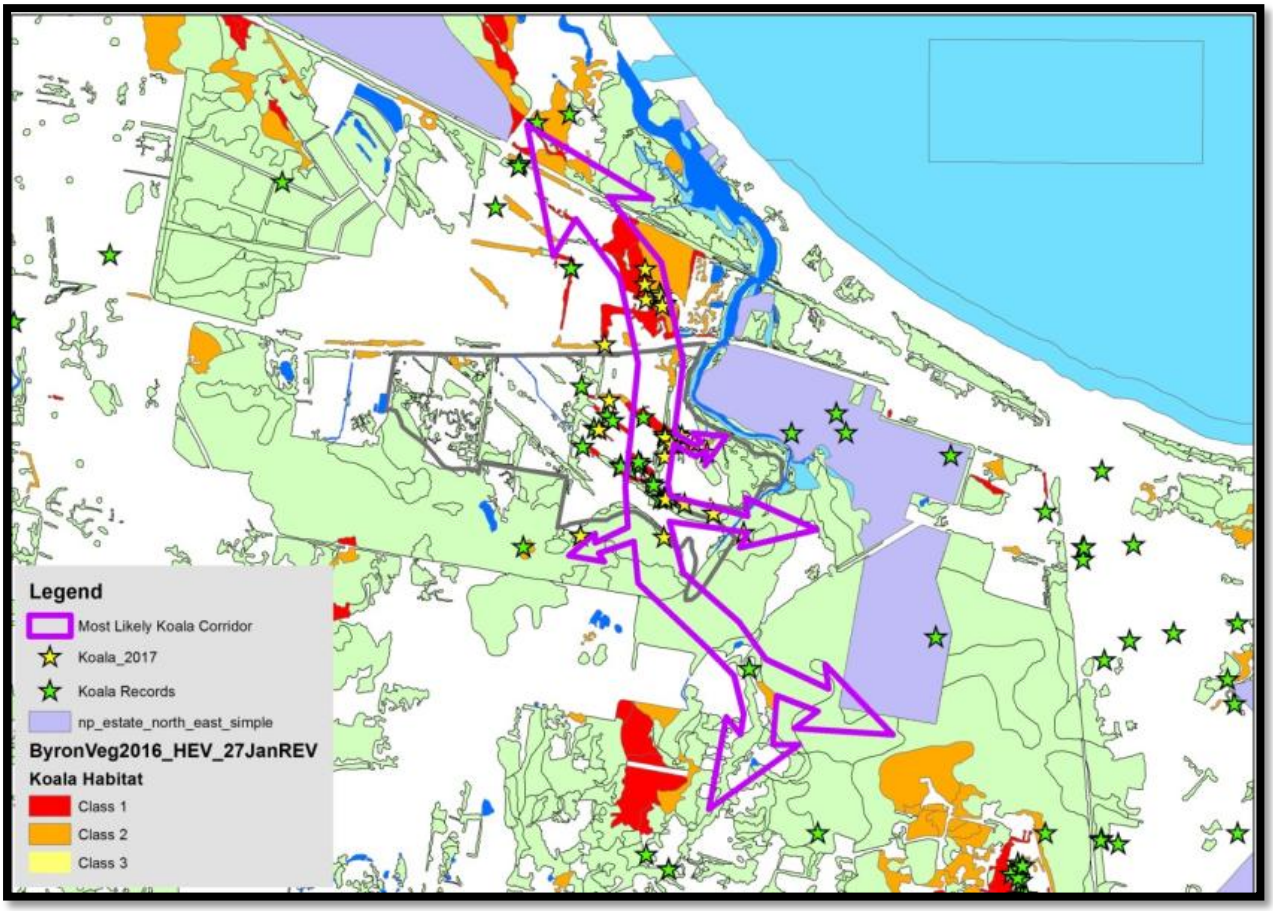
"*Areas supporting known Koala populations should not be developed for urban purposes and in rural areas land use should not be intensified, as research clearly demonstrates that this results in koala deaths, population declines and local extinctions. Councils should zone land known to support viable populations of Koalas for environmental protection. ...*"

"Several proposed urban development precincts are adjacent to, or encroach upon, known or predicted koala habitat. Development of these areas should be reviewed to ensure that core koala habitat, as defined by SEPP 44, is excluded and that indirect impacts on the

mobility and viability of the population due to the position and intensity of the development are fully mitigated.

"To promote a strategic approach to kola management, comprehensive koala plans of management should be developed according to SEPP 44. ... Development of [known or predicted koala habitat] *should be reviewed to ensure that core Koala Habitat, as defined by SEPP 44, is excluded and that indirect impacts on the mobility and viability of the population due to the position and intensity of the development are fully mitigated*" (5.2)

The proponents, West Byron Landholders, prepared a State Significant Site Study and a Preliminary Development Control Plan (DCP) for the site which were exhibited by the Department of Planning and Investment (DoPI) on 12 October 2011.



Core Koala habitat identified around Byron Bay and the presumed major Koala dispersal corridor. Note the fragmented distribution of Koala habitat. As well as small but significant patches of occupied core koala habitat, West Byron comprises key stepping stones linking populations to the north and south of West Byron which are essential for maintaining the viability of the population and the persistence of Koalas around Byron Bay.

Ironically the NSW Environment Minister, Robyn Parker (27 October 2011), told an Environment and Heritage Estimates hearing two weeks later:

It is clear that in some areas there are impacts of human existence, where we are building and developing in areas, that threaten a number of species, the koala being one of them. What we have to do is make sure that whenever there is a new development we protect the environment in which they live; that whenever there are new roads we have a management plan that addresses what happens with koalas. We make sure that the habitat in which they

exist is protected. The Senate environment committee inquiry identifies things such as urban development, forestry, mining, climatic events such as droughts, bushfires, disease, dog attacks and motor vehicle strikes. Those are the major threats to species, and koalas are one of those species.

The West Byron Landholders had commissioned a report on Koalas by Biolink Ecological Consultants in 2010 which the developer and DoPI found inconvenient, so they decided to suppress it and subsequently omitted it from the exhibited documents.

In 2010 Biolink recorded Koala activity at 12 of 14 field sites, observed two Koalas and identified Core Koala Habitat. Biolink (2010) mention that:

Thus we conclude that core koala habitat is present within the study area and hence a Koala Plan of Management that effectively addresses the requirement to manage such areas for the conservation of koala population will be required ..

...

... Interpolation of koala activity data recorded during field assessments depicts the general distribution and extent of core koala habitat on the site as approximating 19ha, occupying the northeastern corner and eastern end of the study area (Fig. 3). In this instance however, modelling over-estimates the extent of core koala habitat due to the highly fragmented nature of the remnant vegetation within the study area. Thus the extent of core koala habitat is realistically restricted to the vegetated areas within these boundaries, although some use of the peripheral cleared areas can reasonably be expected to occur over time as koalas move through and/or make use of the site.

Figure 3 Distribution and extent of core and potential koala habitat
Illustrated are the 23% (medium/normal use) and 32% (high use) activity threshold contours indicative of core koala habitat boundaries. Forested areas within these boundaries provide the best approximation of the areal extent of core koala habitat on the site.

...

The two 2007 records from the site along with our observations of two koalas during the course of fieldwork clearly establish the presence of the species on the site. Additionally, and

more importantly perhaps, activity levels recorded at the majority of our field sites clearly exceed those thresholds specified as being indicative of the presence of core koala habitat and representative of occupancy by a resident population. Thus we conclude that core koala habitat is present within the study area and hence a Koala Plan of Management that effectively addresses the requirement to manage such areas for the conservation of koala population will be required to accompany any Development Application for this site.

...

... we identify two broad options which may form the basis for planning use of the site in consideration of the above. These options are as follows:

(i) Excluded development

This concept would require designation of a koala habitat area focused on the mapped areas of core koala habitat and from which all development would be excluded. This approach may allow some modification of currently unoccupied areas of potential koala habitat for the purposes of development, but would require adequate compensation in the form of replanting of potential koala habitat that serves to ultimately increase the total area of protected koala habitat while at the same time decreasing current edge to area ratios.

(ii) Integrated development

This concept infers integration of koalas and their habitat into any (re)developed landscape in a way that does not place continued persistence of the population in jeopardy. Along with the specific principles outlined above, development design would incorporate such factors as larger lot sizes (to an extent that retention of food trees in situ is feasible), remnant embellishment with associated (food) tree plantings, a prohibition on the keeping of domestic dogs and vehicle calming devices on any proposed roadways.

To refute Biolink's results the proponents engaged another company Australian Wetlands Consultancy Group (AWCG) to prepare an Ecological Study. They spent 3 nights spotlighting in Nov 2010, observing 2 Koalas one night and one on the third night, which they considered could be a repeat. They also undertook scat searches at 36 survey plots, recording Koalas at 11 plots. .

The developer's decided not to admit that core Koala habitat actually existed, instead stating:

Core Koala habitat is likely to occur, and therefore a Plan of Management would be required for the future development of the site once the rezoning process has been finalised.

Meanwhile Byron Shire Council were in the process of preparing their Byron Coastal Koala Plan of Management, the first step of which was to undertake a habitat study. In 2012 the Byron Coast Koala Habitat Study (Biolink 2012) identified significant patches of primary Koala habitat as occurring at West Byron, and recognise this habitat as part of an isolated population of around 240 Koalas extending from the Brunswick River south to Broken Head. Within this range 5 "cells" of high activity were identified, with two major koala population centres identified; Myocum – Tyagarah, and West Byron. West Byron extends through Cumbebin Swamp in the east to the West Byron Urban Release Area. Biolink note:

The presence of a resident population cell at West Byron was also alluded to by the analysis of historical records, confirmed by field sampling and supported by previous work in the area (Phillips and Hopkins 2010b).

...

While transient koalas ultimately contribute to overall population size, the primary focus of conservation and management efforts must be to maintain and ultimately increase those areas currently occupied by the main resident (source) populations of the area. Thus it remains that the bulk of the BCSA's koala population is contained within the Myocum – Tyagarah, West Byron and Mullumbimby localities.

Biolink recommend:

> *... there is a need to not only recognise currently occupied areas as core koala habitat and implement management accordingly, but also for areas of high quality koala habitat to be afforded the highest level of importance and protection.*
>
> *There will be a need for adoption of a standard Development Control Plan to ensure that all future developments in the vicinity of the remaining areas of koala habitat and/or any resulting KMA consistently result in implementation of 'best-practice' koala-friendly planning measures.*

In a supplementary submission to DoPI Council identified the need for significant changes to the zoning and DCP for them to comply with Council's draft Coastal Koala PoM, noting:

> *... Council is concerned about likely impacts on the local koala population that would result from the proposed rezoning and development of the West Byron Urban Release Area. The release area is within the area covered by the CKPoM, is currently occupied by koalas and is core koala habitat.*
>
> *... Significant north−south koala habitat linkages have been identified at the eastern edge of the release area (alongside Belongil Creek) and its western edge, which are required to be maintained and restored to retain and improve connectivity between currently isolated populations throughout the coastal area.*
>
> *The CKPoM will aim to ensure that development within a Precinct must be 'koala friendly;' not only to ensure no adverse impact on existing koala communities but also to enable the long−term persistence of resident koala populations. To that end any application to amend the Byron LEP must address all of the requirements of the Plan, which includes the following specific planning controls:*
>
> - *Any rezoning proposal which includes preferred koala habitat must include a Vegetation Assessment Report to ensure that koala habitat is correctly identified*
> - *Any rezoning proposal within Preferred Koala Habitat, a Linkage area, or a KMP must include a Koala Habitat Assessment to ensure that the extent of any habitat occupied by koalas is correctly assessed and any potential for negative impact can be identified.*
> - *Within a KMP, inter alia:*
>   - *There shall be no removal of any preferred koala food trees > 200mm dbh.*
>   - *The keeping of domestic dogs on any new residential lots arising from the subdivision of land shall be prohibited by Covenant and/or Community Title Management Statement.*
>   - *Road design standards and/or approved vehicle calming devices must be incorporated such that motor vehicles are restricted to a maximum speed of 40km/hour within a development area.*
>   - *Any Asset Protection Zone (APZ) must be provided within the development area and must not result in the removal of koala food trees.*
>
> *The rezoning proposal for West Byron has not included any of this analysis and therefore it is not possible to provide an assessment of the impact of any development of the West Byron Urban Release Area in respect of koalas and the requirements of SEPP 44.*

The Office of Environment and Heritage (OEH) Submission of 16 October 2012, Attachment 1: OEH detailed comments − proposal to list West Byron Bay as a State Significant Site

> **Koalas**
> *The West Byron area is part of a Koala Management Area (KMA) in the Byron Coast Koala Habitat Study (Biolink 2012). Primary koala habitat in the West Byron KMA comprises*

forests and remnant trees dominated primarily by Swamp Mahogany. Both older records and recent survey evidence show historical koala usage of these areas. Accordingly, this habitat meets the definition of Core Koala Habitat within the meaning of State Environmental Planning Policy No. 44 − Koala Habitat Protection.

The koala population in this locality is of a genetic makeup already known to be more sensitive to disturbance than other populations. The subject land is therefore proposed to be encapsulated in the West Byron Koala Management Precinct within the Byron Coast Comprehensive Koala Plan of Management. The West Byron koala population will also be identified as an important population for the purposes of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999.

The Environmental Assessment (Planning Report) prepared by Landpartners (June 2011) states that the koala population recorded on the site is most probably migratory rather than resident. This statement appears misleading and may lack scientific credibility given the historical and current use of the site by a number of koala individuals. The Planning Report also states that the area and number of koalas is too small for a viable population, even though this area is part of a wider population cell and an area of habitat.

The subject site should not be assessed in isolation from the surrounding area. Additionally, the Planning Report states that koalas should be encouraged away from the site and that compensatory habitat can be established nearby. Such an approach, however, does not take into consideration that the Swamp Mahogany remnants within the site are part of the core habitat presently used by koalas and that any compensatory habitat establishment has at least a ten year time lag. The statements in the Planning Report are therefore inconsistent with respect to maintaining the Swamp Mahogany forest remnants whilst encouraging exclusion of koalas that presently utilise the trees.

Further, the statement that revegetation along Belongil Creek and other areas will mitigate the impacts of infilling the site with urban development does not take into account the current pattern of use of the area by individual koalas that will be displaced. Revegetation, whilst encouraged, will be of no use to existing koalas for at least ten years.

The Byron Koala Advisory Group at its meeting of 8 October 2012 determined that the proposal is likely to result in the demise of the koala in this area due to impacts from urban development, the removal of Swamp Mahogany trees, as well as the introduction of dogs, cars and disturbance. The recommendations from this meeting are as follows:

- *Reduce the size of the urban footprint by incorporating the southern and eastern areas of the site into environmental zones (for habitat restoration);*
- *Require a staged development footprint to enable the cleared urban areas in the north of the study site to be developed initially, thereby protecting the existing lineal strips of Swamp Mahogany trees on the site and allowing time for the environmental restoration areas to be restored to a size preferred by koalas prior to developing the remainder of the site as a second stage;*
- *Ensure that the linkage to the north east of the site is protected and enhanced.*

In this regard, the zoning plan provided to the Department of Planning and Infrastructure from Byron Shire Council (21 August 2012) addressing impacts on the koala is supported by OEH, as well as the inclusion of specific controls in the draft DCP for the site in relation to the staging of the development, koala friendly design (i.e. 40kph roadways, no dogs or cats), and fencing of the E2 and E3 zones to prevent koalas from entering urban areas.

Though the DoPI were not to be swayed by arguments for further assessment of Koalas or the need to modify the developer's proposal. In November 2013 the DoPI exhibited their proposed draft State

Environmental Planning Policy for the site, which was basically that put forward by the proponent with minor changes. This included the proposed rezoning and a draft Development Control Plan (DCP) for the site.

The DoPI didn't seem to have any understanding of Koala ecology and appeared to have sided with the developers against the advice of OEH and Byron Shire Council. The developers, and their consultants Austeco (Smith 2012), went to great lengths in their attempts to denigrate the importance of West Byron for Koalas in order to successfully convince DoPI to ignore the recommendations of the Office of Environment and Heritage (OEH) and Byron Shire Council (BSC), as well as their legal obligations. Smith (2012) going so far as to make the outrageous claim that:

> *This habitat has the potential to act detrimentally to regional koala conservation and population viability by attracting koalas across Ewingsdale Road from the north exposing them to potentially fatal collisions with motor vehicles.*

Many of Smith's (2012) claims were based upon unsubstantiated conjecture and were not supported by the available evidence. To the contrary the evidence suggests a fragmented coastal population, relying on small isolated patches of core habitat, that depends upon dispersal amongst the population for their ongoing viability and persistence. The habitat within the site is obviously core Koala habitat supporting at least 2 Koalas and is a vital link for maintaining connectivity between Kolas to the north and south. Given the small patches of primary habitat south of Ewingsdale Road and the low numbers of records, the more likely scenario is that as proposed the West Byron suburb will isolate Koalas to the south of Ewingsdale Road, making them unviable and leading to their extinction.

BEACON made a significant issue of this in their submission to DoPI, detailing evidence that contradicted the claims made. BEACON expected that at the very least the DoPI would obtain independent expert advice, particularly in light of the submissions from OEH and BSC though (as revealed by a later freedom of information request) they made no attempt what-so-ever to obtain independent advice, instead accepting the proponents position without question.

In their draft DCP DoPI also displayed their disregard for planning processes by ignoring the SEPP 44 and Far North Coast Regional Conservation Plan requirements for a Koala PoM. DoPI recognised that core Koala habitat was both proposed for clearing and to be zoned E3 (with a broad range of allowable uses). As noted by Smith (2012) E3 zones were designated as such to allow major works to be undertaken within them:

> *The location of E3 zones was chosen to allow for the construction of stormwater processing infrastructure and possibly perimeter roads. The extent of these works is to be determined in subsequent master planning, environmental management plans and additional DCPs at a later date, after rezoning but before development. .... Water treatment infrastructure will be located within E3 zones.*

DoPI's draft DCP theoretically required the preparation of a Koala Habitat Protection and Restoration Plan (rather than the legally required Koala POM) as a sub-plan of a Vegetation Management Plan, though this requirement only came into effect for *"Any application for subdivision ... of or within Zones E2 Environmental Conservation or E3 Environmental Management"*. Why would any of the property owners want to subdivide in an environmental zone?

In late 2013 Byron Shire Council exhibited their draft Byron Coast Comprehensive Koala Plan of Management (CKPoM). It mapped Preferred Koala Habitat and identified it as being "*Core Koala*

Habitat" within the meaning of SEPP 44, and recommended that "*Council shall consider the merit of zoning for Environmental Protection all or some of the mapped areas*". It also proposed establishing 50m buffers around Preferred Koala Habitat, within which "*Council cannot approve a development application unless it is satisfied that the proposal will not impact on the associated area of Preferred Koala Habita*t". The NSW Government refused to allow the plan to be adopted.

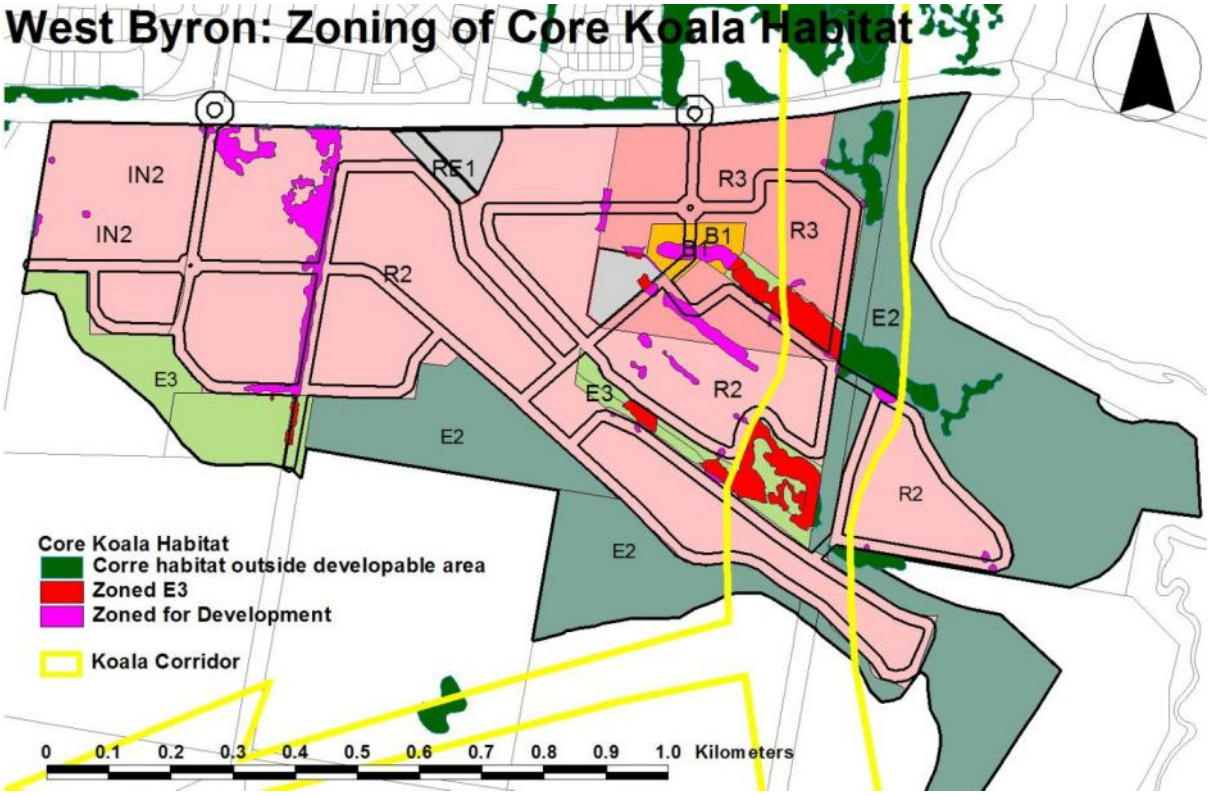
The Department of Planning and Environment's Assessment Report was released in November 2014. It ignored the draft CKPoM and dismissed community concerns about the Koala, which had been a focus of the community campaign, with over 1,800 people signing a Change.org petition calling for the protection of the Koalas (which the DoPE did not even acknowledge were opposed to the development). DoPE made no significant changes to the exhibited proposal aside from increasing the density of housing allowed.

DoPE did not bother to obtain independent advice on Koalas, and decided to ignore the Byron Coastal Koala Plan of Management and the clearing of 2ha (37%) of the 5.5ha of Koala habitat on the site, as well as feed trees scattered throughout other vegetation and cleared areas of the site, instead going along with the developer's view that *"impacts on koala habitat can be adequately mitigated and supports the consolidation of habitat along Belongil Creek"*. The fact that the strip adjacent to the creek is a sedge wetland and thus unsuitable habitat that will rapidly get inundated by rising sea levels appeared to be incomprehensible to them.

Some 32% of the core Koala habitat was identified as an E3 zone, with allowable uses including clearing for drains and Asset Protection Zones and numerous other uses. The zoning permits:

> ***79 Zone E3 Environmental Management***
> *(1) The objectives of Zone E3 Environmental Management are as follows:*
> *(a) to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values,*
> *(b) to provide for a limited range of development that does not have an adverse effect on those values.*
> *(2) Development for any of the following purposes is permitted without development consent on land within Zone E3 Environmental Management: environmental protection works; home-based child care; home occupations.*
> *(3) Development for any of the following purposes is permitted only with development consent on land within Zone E3 Environmental Management: bed and breakfast accommodation; boat launching ramps; building identification signs; business identification signs; camping grounds; community facilities; dual occupancies (attached); dwelling houses; eco-tourist facilities; emergency services facilities; environmental facilities; extensive agriculture; farm buildings; farm stay accommodation; flood mitigation works; home businesses; home industries; horticulture; jetties; places of public worship; recreation areas; roads; veterinary hospitals; wharf or boating facilities.*

Having previously proposed to do nothing for Koalas, at least DoPE now recognised that their draft DCP should be amended to require the preparation of a Koala Plan of Management before DAs were considered.



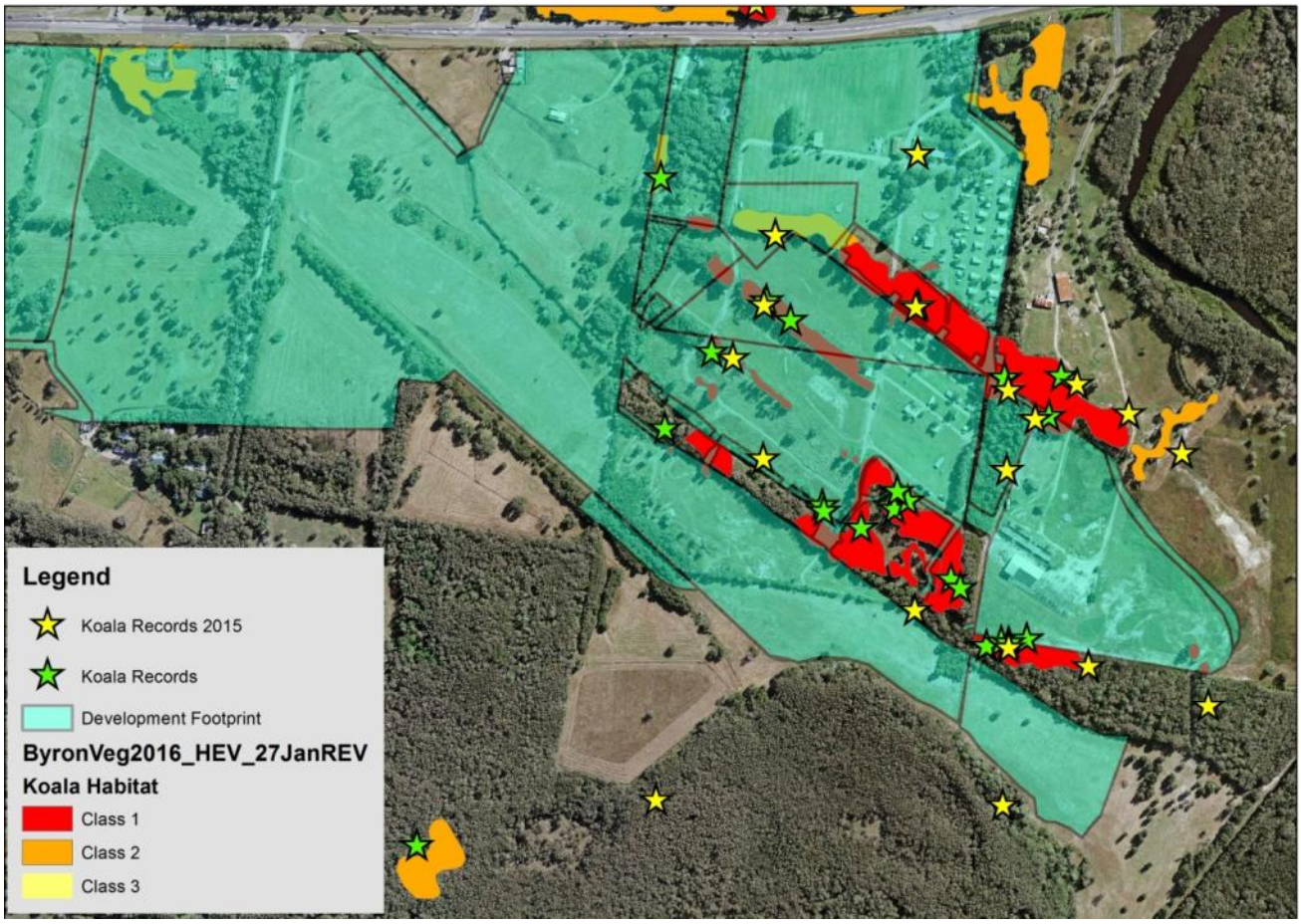
Department of Planning and Environment zoning of Koala habitat (as identified at that time), and proposed road network at West Byron

Despite the proposal being to clear and surround core habitat for the nationally vulnerable Koala in a vital wildlife corridor, and to totally clear a wetland inhabited by the nationally Vulnerable Wallum Sedge Frog, DoPE considered "*The proposal would be unlikely to have a significant impact on species listed under the EPBC Act",* so they refused to refer it to the Federal Environment Minister.

Byron Shire Council ended up preparing a Development Control Plan (DCP) for the site in June 2017. The DCP E8.10.5.1 Biodiversity and Vegetation Management includes a requirement to prepare a Koala Plan of Management (KPOM) in accordance with the requirements of State Environmental Planning Policy No. 44 – Koala Habitat Protection to address:

- *SEPP 44 Guidelines for Individual KPOMs*
- *Potential and **Core Koala Habitat** on and surrounding the site*
- *Rehabilitation of habitat in the E Zones to focus on Koala Habitat restoration to address any compensation requirement and to provide or embellish linkages between potential and core koala habitat areas*
- *measures to protect existing koalas whilst new habitat is being established.*
- *details of koala friendly crossings under / over Ewingsdale Road, and timing and responsibility for their delivery.*
- *other measures to protect koalas including reduced vehicle speeds and traffic calming measures, development fencing, dog prohibition or control, pool safety through design measures such as ramps or "beaches", control on construction activities, signage, appropriate building envelopes having regards to bushfire requirements for asset protection zones.*

Two Development Applications (DAs), one by Villaworld and one by Site R&D, were released for the residential zones in early 2018. According to Council's latest mapping there is 5.5ha of Koala habitat on the site, as well as feed trees scattered throughout other vegetation and cleared areas of the site. The footprint of the development identified in the DAs would result in the clearing of 2.04ha (37%) of Koala habitat, comprised of 1.56ha zoned for development and 0.48ha within environmental zones proposed for infrastructure, as well as an unidentified number of scattered feed trees.



BSC identified Koala habitat and combined Koala records at West Byron, overlaid with the development footprint. Two hectares of core Koala habitat is proposed for clearing and the remaining habitat fragmented and surrounded by development. Note that while there is a strong correspondence between Koala records and mapped Class 1 and 2 habitat, Koalas were also frequently found to be using trees outside mapped habitat.

Contrary to Biolink's 2010 assessment, Office of Environment and Heritage (OEH) Submission of 16 October 2012, and the draft Byron Coast Comprehensive Koala Plan of Management Plan (2015) both DAs remain in denial that there is any core Koala habitat on the site. Villa World did not undertake a SEPP 44 assessment, claiming "*Whilst it is recognised that a Koala Plan of Management is required for the WBURA development, this is more relevant to lots containing core koala habitat*". For Site R&D AWC did prepare a Koala Plan of Management on the grounds that Koala habitat occurs on the site, though refused to admit that Koalas are resident on the site and that core Koala habitat occurs:

> A small and highly fragmented area (~3.7 ha) of potential koala habitat occurs on the site but it does not support a resident breeding population of koalas because of its small size and fragmentation.
>
> ...

> Koalas periodically observed on the site are considered to be transients that have dispersed onto the site from more extensive primary koala habitat elsewhere, most likely to the north of Ewingsdale Road. The necessity for koalas to cross Ewingsdale Road, a potential blackspot for roadkill, to reach the site identifies it as a potential sink area where mortality may exceed reproduction. No resident breeding females have been recorded on the site, most likely because of its small size and fragmentation.

AWC's IKPoM is adamant that Council's requirements for Koalas are excessive and refused to implement some:

> Both the DCP and CKPOM incorporate several measures that appear inaccurate, excessive or unnecessary (refer Smith, 2014) and which go well beyond the level of mitigation required under SEPP 44 and the approved recovery plan. These include requirements to:
>
> a) Establish buffers in areas where they are not required.
> b) Retain and protect habitat which is not core habitat within the meaning of SEPP 44.
> c) Apply planning controls (e.g. fence design, dog control, road design, retention of koala food trees) in urban areas where koalas and koala habitat are not present and where koala movement should be discouraged.
> d) Mandate the use of koala survey and habitat assessment methods which are inaccurate, unscientific, and inflexible.
> e) Deliver a koala friendly crossing over/under Ewingsdale Road.

Council's DCP (E8.10.5.1 Biodiversity and Vegetation Management) requires that a Biodiversity Conservation Management Plan, including a Koala Management Plan, be prepared for the entire Urban Release Area. Instead the two DAs undertook distinctly different approaches to Koala conservation and only one developer prepared a IKPoM.

Their inconsistent approach is exemplified by their approach to dogs. Villaworld proposed abiding by the DCP and prohibiting dogs from their development, while Site R&D considered that the requirement to exclude dogs was too onerous and proposed to install fencing to exclude Koalas from all urban areas.

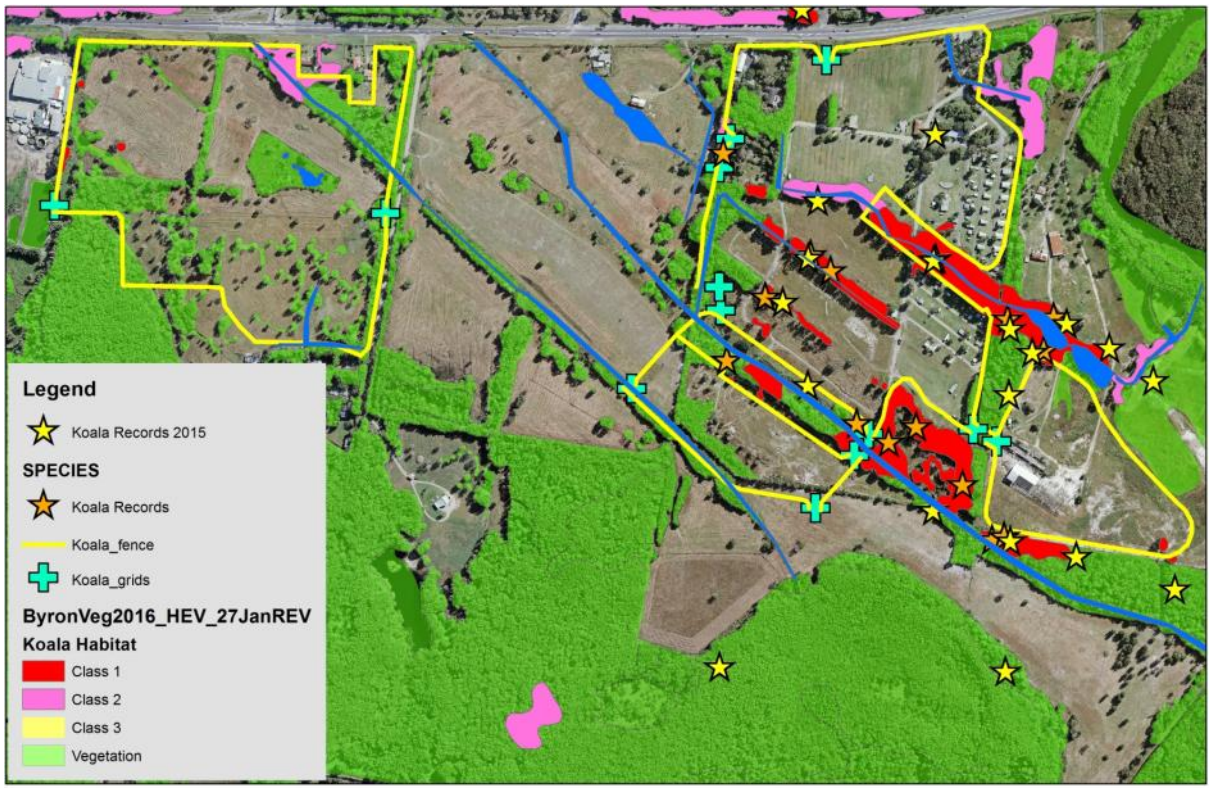
This proposal is inconsistent with Council's draft CKPoM 2015 in that it meets the definition of "enclaving" used in the BSC draft CKPoM 2015 **12.4 Non-conforming subdivisions**, where it specifies:

> *(ii) Areas of land where the presence of koalas has been established by a Koala Habitat Assessment Report cannot be included in any land that is proposed for enclaving*

The draft CKPoM 2015 also proposes under "**12.3.2 Development Standards for *Large Development":***

> ***Fencing***
> *(i) Fencing of residential lots must not impede the movement of koalas.*

The Local Landholder's proposal to fence off Koala habitat so as to allow dogs in developed areas conflicts with Villaworld's proposal to abide by the DCP and prohibit dogs, particularly on the interface between both developments.



Site R&D's proposed Koala Proof Fence is intended to fence Koalas out of development with 13 grids on roads, and gates. While the effectiveness of grids in excluding Koalas is uncertain, it is certain they will not exclude dogs from Koala areas. This fencing severely reduces the ability of Koalas to disperse through the site, while creating potential Koala traps in the form of bottlenecks and cul-de-sacs.

Council's ecological consultant (Fitzgerald 2018) considered:

> *The decision to separate the residential area from Koalas by the use of exclusion fencing will create additional barrier effects and may result in Koalas becoming trapped in the residential area. The decision to ignore the DCP recommendation regarding the prohibition of dogs and cats is also detrimental to the future persistence of Koalas in the location.*

Council's consultant (Fitzgerald 2018) identified the obvious problem with two different developers preparing their own inconsistent plans:

> *The division of the WBURA development into two separate proposal is problematic for reliably identifying the likely net impacts of the developments on the local ecosystem.*
>
> *This is especially the case where some documents address the overall WBURA development and others only address the site R & D development. Without assessing the overall WBURA impacts, as well as synergistic effects e.g. on traffic in Ewingsdale Road, the identification and assessment of impacts are significantly underdone.*

At the time Council had prepared their Coastal CKPOM which provided the overview required, though because the State Government refuses to adopt it the developers were free to ignore it. Similarly as the DCP is only an advisory document it too could be ignored. Despite Council's efforts to do something meaningful to protect Koalas on the site there is little they can do because DoPE's rezoning has sealed their fate.

The preferred outcome for Koalas would have been to consolidate Koala habitat by plantings around the area of primary use and in the corridor (in areas now zoned R2 and R3), to buffer this with a low development precinct to the west, and to construct an underpass under the main road.

2.3.2. Council Case Study 2: Bluesfest

In 2008 the Blues Festival (Bluesfest) submitted a Development Application for the use of a property at Tyagarah as a venue for the Bluesfest for just one event The Byron Shire News (19 June 2008) reported that "*Festival director, Peter Noble, last week made it very clear there would be only one music festival a year at the site*".

Koala surveys in 2007 and 2008 observed Koalas on 6 out of 8 spotlight surveys, leading to the conclusion (AWC 2015) "*the Koala sub-population size ... was relatively low*". Conversely 7 reduced SAT surveys found that 6 had Koala activity, with 5 showing activity levels greater than 50%, AWC (2015) noting "*It was concluded the site was likely to be located within an area of major Koala activity*".

Byron Shire Council Approved the DA in 2009 on a trial basis to 2012 for an annual five day festival with a maximum of 20,000 people per day.

Both the approved festival site and immediately adjoining lands were known to be used by koalas. A site-specific Koala Plan of Management was prepared, with a further program of koala habitat assessment and monitoring of individual koalas on the site through radio-tracking required by the Department of Planning as a condition of consent.

In 2011 Council approved a Section 96 application to modify the lapse date to enable the Bluesfest to occur annually from 2015 up to and including the year 2021. In 2013 approval was given for an additional 3 day event Boomerang Festival in 2013 and 2014. In 2014 the Bluesfest approval was made permanent. A development application was lodged with Byron Shire Council in 2014 seeking consent to change the existing approved use (being a single annual five-day event) to allow

- Small Event: Not more than 2,000 people No restriction on frequency of events
- Medium Event: Between 2,000 to 15,000 people Maximum of 10 *event days* per annum
- Large Event: Between 15,000 to 25,000 people Maximum of 10 *event days* per annum

Phillips (2016) undertook radio-tracking of Koalas to identify the impacts of the first Bluesfest of the site in 2010, identifying that he monitored the movements of seven koalas before, during and after the first five-day music festival, noting:

> *During the monitoring program koalas occupied home-range areas of 0.6–13 ha with one or more core areas of activity. Aversive behaviour in the form of evacuation of known ranging areas was demonstrated by three koalas that had core areas within 525mof the approximate centre of the festival area, the associated responses comprising movements that were perpendicular to and away from staging areas where music was played. Responses contained within known ranging areas were observed in three other koalas whose core areas were located up to 600m away. The type of response appeared related to the proximity of koala home ranges to music-staging areas, while the maximum distance associated with an aversive response was 725m.*

Based on the 2010 monitoring outcomes and that undertaken in 2012 by FitzGibbon and Ellis (2012), Biolink (Phillips 2013) prepared an addendum to the draft Byron Coast Comprehensive Koala Plan of Management in which they identify:

i. *there was a trend towards a lesser number of animals being present on the site during the 2012 event than were present during the inaugural event in 2010 (7 vs 11);*
ii. *there was a low number (n = 1) of recaptures between the 2010 and 2012 monitoring events, implying a high level of population turnover in the interim period within which a further festival event occurred;*
iii. *both studies reported unusually high levels of koala mortality ...; and*
iv. *both studies reported aversive behaviour in a similar proportion of individual koalas for which adequate radio-tracking data sets were available.*

Phillips (2013) concluded:

> *...in all instances the koalas who demonstrated aversive behaviour were those generally within a distance of up to 500 metres from the staging areas. Moreover, the vacating of home range areas was also most commonly associated with the duration of the "musical" component of the event (i.e. not the "bump-in" or "bump-out" phases). The long term implications of this behaviour are uncertain, but should not be discounted or trivialised (adult koalas normally exhibit strong fidelity to their individual home range areas) given the potential over successive events for the permanent vacating of suitable habitat areas within the sphere of disturbance created by the musical component of the event may ultimately result.*

Byron Shire Council's 2013 draft Coastal CKPoM stated:

> *Monitoring of koala movements when exposed to the impacts of amplified sound associated with music festivals has confirmed aversive behaviour in the form of evacuation from individual home range areas. Data suggests a critical distance of ~ 650m is involved, the implications being that over the course of repeated festival events such areas of habitat as are present within the critical distance will not just be vacated by koalas but also be no longer capable of supporting anything other than transient use by koalas.*

The 2013 draft Coastal CKPoM proposed that "*all identified areas of Preferred Koala Habitat within a radius of 650m from any proposed stage areas must be assessed as lost to use by a resident koala population",* and that *"an identical area (or areas) of Preferred Koala Habitat must be created to replace that which must be assessed as lost to koalas*".

In October 2013, based on concerns raised about Bluesfest, Byron Shire Council refused a recommendation that Council's draft Coastal CKPoM go on public exhibition, instead resolving that first a stakeholder workshop for music festivals would occur and that the Project Reference Group (PRG) overseeing the plan's preparation would be required to conduct a subsequent review of the Koala Plan of Management, and that if the PRG and the festival promoters can't agree then an independent review will be commissioned.

Echonet (October 17, 2013) reported that Friends of the Koala president Lorraine Vass put this outcome down to the influence of Bluesfest director Peter Noble, stating "*that the interests of one landholder can delay exhibition of the instrument that is aimed at addressing the bigger picture of*

koala survival in Byron's coastal areas demonstrates councillors' inadequacy to deal with inordinate influence".

Byron Shire Council's 2013 draft Coastal CKPoM was exhibited on 11 February 2014 after being changed to reduce the distance from 650m down to 500m, and to be more equivocal about impacts, stating:

> *Monitoring of koala exposed to the impacts of amplified sound associated with music festivals indicates that such exposure may cause aversive behaviour in the form of evacuation from individual home range areas.*
>
> *Some Koalas respond by temporarily moving outside of their normal home ranges during some events. Data suggests that koalas residing within 500m are more likely to be affected, although responses may vary between sites and events. As such koala use of habitat within a 500 m radius of a festival may be reduced and enhancement or compensation is sought.*

Steve Phillips findings were reported in the Sydney Morning Herald on January 21 2016 and strongly criticised by Sean FitzGibbon from the Koala Ecology Group at the University of Queensland, the consultancy team for Bluesfest, who responded "*It is commonly known stress predisposes animals to disease, but there is not a lot of evidence to say this occurs in koalas.*", "*The conclusions from Mr Phillips' study are not supported by the data we have collected in the four years since*", and "*koalas stress responses from the festival were "minor*"".

FitzGibbon *et. al.* (2016) refuted Phillips (2016) conclusions, stating:

> *We conclude that Phillips' paper is based on sufficient data to state that three, not six, of the koalas he studied displayed a short-term behavioural response to the music festival. These koalas temporarily moved outside of their estimated ranges during the festival period (10–80m).... For the two deaths that are reported, no mention is made that these koalas had pre-existing disease. Rather, the author raises the possibility that the mortalities may have been related to festival-induced stress.*

Phillips (2013) does consider that Sean FitzGibbon's 2012 results confirmed his 2010 observations. To help resolve the issue, the results from the 2010, 2012 and 2013 monitoring surveys, the only ones available online, were reviewed. It is clear that both the 2012 and 2013 monitoring results confirm Phillips' concerns. Note that for this review only approximate distances to the "even site" where concerts were held are identified, the distance to the actual stage was not ascertained.

The 2010 Koala monitoring report by Biolink (Hopkins and Phillips 2010) identifies that for various periods over 6 months around the inaugural 2010 Bluesfest (1st-5th April 2010) 11 Koalas were radio-tracked, at least 6 of which died "*one was most likely attributable to capture stress/myopathy*" and for 4 "*it is possible that the combination of the animals' already compromised state and festival activity contributed to the deaths of these animals*". At least four of the six koalas for which sufficient data was available demonstrated aversive behaviour.

For the 10 inaugural Koalas aged, one was 2 years old and the remaining 9 were 4-7, with an average age of 4.5 years. Hopkins and Phillips (2010) note "*population is generally in good condition with sufficient levels of reproductive output, a notion supported by the approximately normal distribution of age classes amongst captured animals otherwise indicating a demographically stable population*". The "*population estimate for the site and immediate surrounds of between 20-30 animals*".

Hopkins and Phillips (2010) recommended "*constraining use of the site for other activities (including any further large-scale music events) to times outside critical temporal components of the koala breeding season*", identifying this as September-January. They made a number of other sensible recommendations, as well as establishing permanent monitoring plots, that seem to have been subsequently ignored.

The 2012 Koala monitoring report by the Koala Ecology Group (FitzGibbon *et. al.* 2012) identifies that for various periods over a year around the 2012 Bluesfest (5th–9th April 2012) 6 adult, and one baby on its mother, were radio-tracked. Average age (excluding the baby) was estimated to be 3.5 years. At the start of the survey one Koala (Ginger) caught was considered so sick she was euthanized. From casual observations another 3 Koalas were thought to use the site, giving a total of 11 Koalas. In February one tracked male (Chillago) was found dead and no sign of a young tracked Koala (Wizza) was found again, leaving 5 that were radio-tracked during the Bluesfest:

> Punta used vegetation near the event site, had a home range of 5.7-9.1ha, remained within his home range but retreated to an area furthest from the event area (the same refuge used by Bonnie the next year) around 350m from the event site.
>
> Red Tag used vegetation near the event site, had a home range 8.3-9.5ha, stayed within her home range around 350m from the event site though didn't move far, but "*When she was again tracked in mid-June her carcass was found at the base of a tree, also within her usual home range area*".
>
> Dax used the vegetation around the event site, had a home range 22.1-26.3ha, but retreated to an off-site area well outside her home range (the same refuge used by Iggy the next year) around 570m from the event site.
>
> Carter used vegetation near the event site and outside the site home range 8.9-9.0ha, "*moved 50– 110m outside of his usual home range area, away from the centre of the Bluesfest site*", located some 400m from the event site.
>
> Wizza was a male who was found shortly before the Bluesfest, he stayed in a small area around 200m from the event site during the event, and was "found dead floating at the edge of Simpson's Creek on the 24th April 2012"

In their conclusions, FitzGibbon *et. al.* (2012) did not consider the death of at least 4 of 7 (57%) of the monitored Koalas (excluding the missing young) warranted mention. FitzGibbon *et. al.* (2012) concluded:

> *... two of the GPS-collared koalas showed no signs of aversive behaviour or physiological impacts as a result of the 2012 Bluesfest event. However, the other two GPS-collared koalas that were alive during the event demonstrated slightly aversive behaviour towards Bluesfest 2012. Sometime in the month leading up to the start of the festival, these letter two koalas moved outside of what was estimated as their normal home range areas.*

The 2013 Koala monitoring report by the Koala Ecology Group (FitzGibbon *et. al.* 2013) identifies that for various periods over a year around the 2013 Bluesfest (28th March–1st April) up to 6 Koalas were radio tracked, three of which died during the monitoring (a high 50% mortality), one was reported dead a few weeks before the festival. Average estimated age was 4.4 years. Casual sightings were considered to represent another 2-3 Koalas, giving a total of 8-9 Koalas. Only 3 Koalas (Brooke, Iggy and Bonnie) were tracked during the festival.

> Brooke had a home range of 5.9ha, she was only located offsite in that part of her range furthest from the event site during the festival (over 600m).

Iggy, a young healthy male, had a home range of 4.9ha, remained offsite near the centre of his territory during the festival which was over 600m from the event site. Iggy, was found dead 2 weeks after the festival, which was described as "mysterious".

Bonnie a female with "good body condition" had a home range of 2.7ha and was the only Koala in close proximity to the event site, she used that part of her territory furthest from the event site during the festival and didn't move far, this was only some 350m away from the event site. She was recaptured over 6 weeks after the festival in extremely poor condition, FitzGibbon *et. al.* (2013) noting:

> *She was recaptured in late May at which point she was taken to Australia Zoo Wildlife Hospital (AZWH), as her body condition had deteriorated, her bladder wall was thickened (ultrasound) and her right eye was protruding abnormally ... Due to the advanced cystitis of this koala, the tumour behind her right eye and her lack of responsiveness to treatment at Australia Zoo Wildlife Hospital, the veterinarians at that facility euthanised Bonnie three weeks after she was admitted.*

In their conclusions, FitzGibbon *et. al.* (2013) did not consider the death of 50% of the identified Koalas, including the only one that remained in proximity to the stage area, warranted mention, stating:

> *...it is concluded that the Bluesfest event did not have a negative impact upon these animals. However, none of these three koalas were located in the vegetation corridors; none of them were as close to the festival events as some of the koalas monitored in 2010 (see Hopkins and Phillips) and 2012 (see FitzGibbon and Ellis), which showed mild aversive behaviour.*

The 2014 Koala monitoring report by the Koala Ecology Group (FitzGibbon *et. al.* 2014) identifies that for various periods over a year around the 17-21 April 2014 Bluesfest 6 Koalas were captured, and a further 4 observed. Two (33%) of the monitored Koalas died, within a few months of the festival one was euthanized and one was found dead. Another Koala lost her joey over this time.

Brooke (tracked in 2013) When first captured in March she was in good condition with a pouched joey. By July she had lost her joey. Last captured in 2015 with "reasonable body condition", dropped from 7 to 6. She had been first captured on site in 2011 and treated for eye infections. Her 1.1. ha home range was within the site.

Newton. Treated in 2013 for severe eye infections. Collar lost in August 2014. His 8.5ha home range was mostly outside the site (south).

Butler. First captured in December 2013 with an inflamed left eye. Last captured early June 2014 when he was euthanized due to an "inoperable and terminal tumour". His 19.8ha home range included an area within the site.

Kasey (new). First captured 18 March 2014, with likely cystitus. Her 0.3 ha home range was within the site, and was the only Koala located towards centre of site. Found dead in early June.

Priya. (new) First captured on Bluesfest site in early June 2014. Previously treated for infected eyes in 2008 at the nearby Tyagarah Pistol Club. Her 6.8ha home range was mostly outside the site (south).

Mavis (new) First captured July 2014 with 2 badly infected eyes. Taken for treatment and returned September 2014. Recorded again in 2015. Her 0.4ha home range was mostly outside the site (south).

In relation to the Central and northern vegetation corridors it is noted (FitzGibbon *et. al.* 2014) "*These corridors were used by resident Koalas in 2010 and 2012, but appear to have been unoccupied since. This is likely the result of the relatively large number of koala deaths that occurred between when monitoring began at the site (2010) and 2013*".

Despite the death of the 2 Koalas closest to the stage area, and the loss of the joey of the only other Koala to occur primarily within the site, and the distribution of surviving Koalas towards and outside the southern boundary of the site, FitzGibbon *et. al.* 2014) conclude:

> *... none of the four collared koalas that were monitored during Bluesfest 2014 showed any signs of aversive behaviour. ... As such, it is concluded that the 2014 Bluesfest event did not have any negative impact upon these animals.*
>
> *...It is hoped that population growth will be observed in the coming years as a result of current management practises and completed and planned habitat enhancement efforts.*

The 2015 monitoring report has not been sighted, though AWC (2015) report that Brooke, Priya and Mavis were still present, and were radio tracked along with 2 new male Koalas, Donovan and Mariachi. Brooke was taken into care in 2015. Donovan was caught in April 2015 and euthanised.

It is extremely concerning that in both 2012 and 2013 over 50%of the radio-tracked Koalas died and there was not a single identified recapture of the 2012 Koalas in 2013, and in 2014 33% of the radio tracked Koalas died and another lost her joey. It is apparent Koala use around the event site appears to be declining and that it is a fatal location for Koalas. These results clearly support Phillips (2013, 2016) concerns from the 2010 and 2012 results. The evidence is that the Bluesfest site is now sink habitat, an area where mortality outweighs reproduction.

AWC (2015) consider "*Despite the lack of certainty for many of the deaths, it would seem that disease is the major threat to Koalas at the site. Since 2011, five Koalas have been taken from the site and later euthanased due to their advanced disease states. Many of the other animals that died of unknown causes were also known to be diseased*". It is astounding that there is no consideration of how the festival itself, and the capture of Koalas, may have contributed to stress and disease.

It is profoundly concerning despite the effort spent on studying the Koala population and the Ecology Research Group have not identified any of these obvious problems, only referring to "*mild adversive behaviour*". In his review for Bluesfest, Colvin (2014) considers that these findings "*revealed that there were no significant or lasting impacts upon the local Koala population*". What happened to the survivors of the 2012 Bluesfest: Carter, Dax, and Punta? Why don't those charged with their welfare care?

In accordance with the Environment Protection and Biodiversity Conservation Act 1999 draft Koala referral guidelines, Colvin (2014) assessed potential impacts of the proposed increase in events on the Koala to determine whether the proposal may require referral to the Federal Environment Minister, identifying that the "*site contains habitat critical to the survival of the Koala*" and "*would impact on Koala habitat within the coastal zone*" but that referral "*would not be required as there is a low risk of significant impacts occurring*".

AWC (2015) summarise the 19 Koala deaths that occurred on site from 2010-15:

Koala ID	Sex	Cause of death	Timing	Study
9874	F	Unknown (though diseased)	29/1/2010 – 57 days prior to 2010 festival period	Biolink (Hopkins & Philips, 2010)
Renee	F	Unknown	17/5/2010 – 37 days after 2010 festival period	Biolink (Hopkins & Philips, 2010)
Junior	M	Unknown (possibly physical trauma due to puncture wound)	1/03/2010 - 26 days prior to 2010 festival period	Biolink (Hopkins & Philips, 2010)
Lil Fi	F	Unknown (though had chronic "dirty tail")	5/03/2010 - 22 days prior to 2010 festival period	Biolink (Hopkins & Philips, 2010)
Sonny Boy	M	Unknown (though diseased)	16/4/2010 – 6 days after 2010 festival period	Biolink (Hopkins & Philips, 2010)
Emmylou	F	Unknown (though diseased)	28/6/2010 – 79 days after 2010 festival period	Biolink (Hopkins & Philips, 2010)
Un-named	M	Euthanased due to cancer in top jaw (collected by FoK, taken to Currumbin Koala hospital)	12/3/2011– 30 days prior to 2011 festival period	n/a
Un-named	F	Died from dehydration after being collected by FoK	15/4/2011– within 2011 festival period	2011 Annual Report (AWC, 2011)
Ginger	F	Euthanased due to urinary tract infection and ovarian cysts (collected by FoK, taken to Currumbin Koala hospital)	28/8/2011 – 117 days after 2011 festival period	UQ KEG (FitzGibbon & Ellis, 2012)
Chillagoe	M	Unknown	Estimated late January / early February 2012 – approx. 2 months prior to 2012 festival period	UQ KEG (FitzGibbon & Ellis, 2012)
Wizza	M	Unknown (possibly drowned; carcass found in creek)	Estimated mid – late April 2012 – approx. 1 week after 2012 festival period	UQ KEG (FitzGibbon & Ellis, 2012)
Red Tag	F	Unknown (possibly succumbed to disease)	Estimated mid-June 2012 – approx. 2 months after 2012 festival period	UQ KEG (FitzGibbon & Ellis, 2012)
Dax	F	Roadkill (Pacific Highway)	5/01/2013 - 39 days prior to 2013 festival period	FoK record, animal tagged as part of UQ KEG (2012)
Keb	M	Suspected dog attack	Estimate mid-March 2013 – approx. 1-2wks prior to 2013 festival period	UQ KEG (FitzGibbon *et al.*, 2013)
Iggy	M	Unknown	Estimate early April 2013 – end of 2013 festival period	UQ KEG (FitzGibbon *et al.*, 2013)
Bonnie	F	Euthanased due to untreatable facial tumour and cystitis (collected by UQ KEG, taken to Aust. Zoo Wildlife Hosp.)	19/06/2013 – 66 days after 2013 festival period	UQ KEG (FitzGibbon *et al.*, 2013)
Kasey	F	Likely succumbed to disease	Carcass found 2/06/2014 – estimate 3-4wks old	(FitzGibbon *et al.*, 2014)
Butler	M	Euthanased due to untreatable tumor on scapular and spine	7/06/2014	(FitzGibbon *et al.*, 2014)
Donovan	M	Euthanased due to multifactorial health issues, including untreatable tumor	28/05/2015	(FitzGibbon pers. comm.)

The latest version of the draft Byron Coast CKPoM, requires the planting of compensatory Koala habitat for any core Koala habitat within 500m from the centre of the staging areas "*based on replacement ratio of 1:1 and may be discount by up to 50% of the total area, if no vegetation is to be removed*", stating:

> *Monitoring of koalas exposed to the impacts of amplified sound associated with music festivals indicates that such exposure may cause aversive behaviour in the form of movement within and out of individual home range areas.*
>
> *Some koalas respond by temporarily moving outside of their normal home ranges during some events. Data suggests that koalas residing within 500m are more likely to be affected, although responses may vary between sites and events. As such koala use of habitat within a 500m radius of a festival may be reduced and enhancement or compensation is sought.*

Colvin (2014) identifies that "*finalisation of the BCKPoM will have no bearing on any activities at the site due to the approved KPoM already being in place*". FitzGibbon *et. al.* (2013) identifies that the Bluesfest KPoM requires that "*future habitat enhancement should be focused on consolidating habitat within and adjacent to the eastern forest*". As compensatory plantings for the proposed dramatic increase in events Colvin (2014) proposed planting Swamp Mahogany (Eucalyptus robusta) spaced at 25m centres, at least 25m from remnant vegetation, within carparking and camping areas. He notes that these plantings are intended to "*rescind the off-site compensation measures required under the approved KPoM*" and presumably the need to consolidate habitat.

Despite these damning monitoring results in February 2014 the Department of Planning and Infrastructure (Steve Murray 20 February 2014) approved a new Draft Koala Plan of Management for increased festivals on the Bluesfest site under clause 13(1) of SEPP 44, noting:

> *If monitoring during year 1 and 2 of the program shows that habitat within the 500 metre offset area is being used by resident koalas then the revegetation program can be adapted/reduced to reflect the new offset area.*

The evidence is of progressive loss of Koalas from with 500m of the event area, and high mortalities for any that venture within it. What is most disturbing is the lack of any acknowledgement that this could in any way be related to the noise, lights and activity associated with the festival site.

A new Koala PoM (AWC 2015) was adopted for the site on 3 July 2015, with a requirement to:

> *Adhere to a monitoring condition contained in the approval for the December 2013 KPoM, namely koala monitoring to be continues using a combination of transects and SAT analysis to determine koala activity over the site, references to 'capture, collaring and tagging' should be removed.*

Byron Shire Council approved Development Application 10.2014.753.1 on 29 February 2016. The Development Approval allows for

- Up to ten large event (25,000 people) days per calendar year including only one multi-day event (of up to 5 days).
- Up to ten medium event (15,000 people) days per calendar year including only one multi-day event (of up to 5 days).
- Up to ten small event (2,000 people) days per calendar year with amplified music. Up to ninety event days per calendar year without amplified music.

2.3.3. Council Case Study 3: Coffs Harbour CKPoM core Koala habitat.

In 1999 the NPWS assisted Coffs Harbour City Council to prepare the first Comprehensive Koala Plan of Management in NSW, and the only one to identify core Koala habitat across a Local Government Area in accordance with SEPP 44. The Department of Urban Affairs and Planning assisted with its preparation and apparently ratified it in 2000, and Council incorporated it into their LEP. Some core Koala habitat was subsequently cleared, and it is likely that some was logged while NPWS and DLWC turned a blind eye. With the adoption of the PNF Code of Practice in 2007, which expressly prohibited logging in core Koala habitat, DECCW began systematically approving logging of core Koala habitat in the Coffs Harbour LGA, with 2,000 of the 19,000 ha of identified core Koala habitat approved by 2010. When DECCW was publicly challenged in 2011 they said the Coffs Harbour CKPoM was not officially gazetted and *"The only solution would be for either DECCW to change their code of practice or the council to change their Local Environment Plan".*

DECCW approved logging of core Koala habitat in contravention of a CKPoM they (as NPWS) had prepared, and when caught out they claimed their plan was not legal. There was no contrition and apparently no consequences for those responsible. Clearly the intent of SEPP 44 was the first casualty.

The Coffs Harbour City Comprehensive Koala Plan of Management was the first to be prepared in New South Wales under SEPP 44 in 1999. It was prepared as a joint initiative by the NSW National Parks and Wildlife Service and Coffs Harbour City Council. The significance of this is major given later events, it is labelled "*A Joint National Parks and Wildlife Service and Coffs Harbour City Council Initiative*" and it is stated that the Department of Urban Affairs and Planning assisted with the planning components of the Koala Management Plan. Its four authors were all NPWS employees, its recommended citation is:

> *Lunney, D., Moon, C., Matthews, A., and Turbill, J. 1999. Coffs Harbour City Koala Plan of Management. Part A The Plan. NSW National Parks and Wildlife Service, Hurstville.*

It covers the whole of the LGA, and in 2000 was given conditional approval by the then Director General of the NSW Dept. of Planning and was incorporated into the CHCC Local Environment Plan 2000 (LEP 2000). Lunney *et. al.* (2016) confirms *"ratification of the CKPoM by Coffs Harbour City Council in 1999 and the State Government in 2000".* It is the only CKPoM to assess and map core Koala habitat across its planning area, with maps depicting five habitat types which are aggregated into primary, secondary and tertiary habitat.

Clause 12 of the LEP 2000 requires the consent authority (council) shall not grant consent to any development on lands mapped as Primary, Secondary or Tertiary Koala Habitat or on lands adjoining Primary Koala Habitat unless the development is in accordance with the KPoM.

Lunney *et. al.* (2016) identifies that despite the CKPoM Koalas still faced challenges: "*Foremost among these challenges was loss of habitat, with areas marked as primary Koala habitat in the CKPoM cleared in late 2000*".

In 2011 the North Coast Environment Council identified that since 2007 the Private Native Forestry (PNF) Division of the NSW Department of Environment, Climate Change and Water (DECCW) had approved 60 separate logging applications covering almost 2000 hectares of the 19,000 ha identified core koala habitat in the Coffs Harbour Local Government Area contrary to SEPP 44. It is

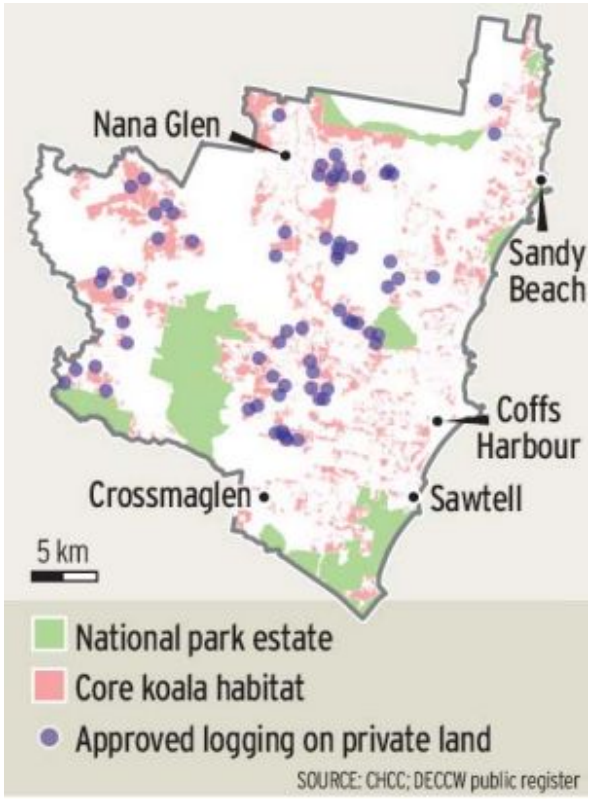
probable that before then logging was being undertaken in core Koala habitat using the PNF exemption.

The Sydney Morning Herald (4 January 2011) reported:

> *The department does not dispute the council's figures, but said the Coffs Harbour koala plan of management, which identifies the vulnerable species' local habitats, is not officially gazetted.*
>
> *Because of this, the prohibition on logging that normally applies to important koala habitats under state environmental planning policies could not be enforced in that council area, the department's director of landscapes and ecosystems conservation, Tom Grosskopf, said.*
>
> *"We're helping them to get their plan updated and get it going," he said.*
>
> *But local environmentalists are appalled and have accused the department of playing word games. The environment council's vice-president, Susie Russell, said the department knew full well where the region's key koala areas were. It had been integral in mapping the habitats, but was ignoring the results and approving their destruction.*

The Coffs Harbour Advocate (29 January 2011) reported DECCW's Director of Landscapes and Ecosystem Management Tom Grosskopf as claiming:

> *He said one of the problems was the Coffs Harbour Plan of Management did not fall under the NSW environmental planning policy but rather the council had its own detailed plan and had written themselves out of the state plan.*
>
> *The only solution would be for either DECCW to change their code of practice or the council to change their Local Environment Plan.*



The Coffs Harbour Advocate (29 January 2011) reported Coffs Harbour City Council's acting director of land use, health and development, Robert Percival, as stating:

> *"There have been significant differences of opinion between DECCW and ourselves regarding the application of our koala plan of management and where it sits in the overall legal framework," Mr Percival said.*
>
> *"We thought our koala POM applied, but DECCW has been saying it doesn't. There are clearly holes in the process and we need to get to the table and sort out where the differences are. We need to get back to the original intent of the plan, which is for the protection of koalas."*
>
> *He said the council's koala plan of management had been prepared in consultation with the National Parks and Wildlife Service (now part of DECCW) and the Department of Planning.*
>
> *"We complied with all statutory processes required in the preparation of the document, which is part of our Coffs Harbour Local Environment Plan."*

It is revealing that the Department of Planning and Environment website (http://www.environment.nsw.gov.au/animals/KoalaConservation.htm) identifies that the Coffs Harbour City Comprehensive Koala Plan of Management 1999 is one of only "*Four plans [that] have been adopted and approved by the Department of Planning and Environment*".

The Coffs Harbour Advocate (29 January 2011) reported DECCW as stating:

> *DECCW says it has a schedule of councils listed in their State Environment Planning Policy for Koala Habitat (SEPP 44) and Coffs Harbour does not appear on it.*
>
> *The department also says it is not aware of any advice from the council that logging approvals it has issued may have been illegal.*

The President of the North Coast Environment Council, Jim Morrison, responded in a media release (31st January 2011) accused the environment department of "*lying about logging in core koala habitat*", releasing excerpts from letters from Coffs Harbour City Council showing that it had been raising concerns about approval of logging in core koala habitat for 16 months:

> 29th September 2009:"*Multiple Agreements have been issued by DECCW for properties containing Primary, Secondary or Tertiary Koala Habitat as mapped by the Coffs Harbour Koala Plan of Management (KpoM)*".
>
> 17th August 2010: "*At that meeting you gave a verbal commitment to provide legal advice from your Department regarding the various concerns Council had raised…..That advice to Council remains outstanding*".
>
> 17th August 2010: "*The concerns expressed by Council have not abated as DECCW continues to issue approvals for logging over legally defined and mapped 'core koala habitat*".
>
> 6th January 2010:"*It is therefore perplexing to see that the NSW Government and in particular DECCW which has carriage to protect koalas as a vulnerable species, is causing the destruction of large tracts of core Koala Habitat and their consequent demise*".

Then Shadow Environment Minister, Luke Foley, (8 November2011) claimed that the Mid North Coast Group of Councils had still not received a reply from a letter they wrote to Robyn Parker on August 19, 2011 stating:

"It is understood that the [Office of Environment and Heritage] have issued a number of Property Vegetation Plan approvals in core koala habitat."

"In line with the objectives of the Native Vegetation Act and the aims of the State Koala Recovery Plan it is considered highly inappropriate to koala conservation and recovery to permit forestry in areas of core koala habitat."

"Accordingly the Mid North Coast Group of Councils seek an immediate policy commitment from the Minister for the Environment that [Office of Environment and Heritage] *will implement the koala prescriptions within the PNF Code of Practice in accordance with the objectives of the Native Vegetation Act."*

Something is fundamentally rotten with a system when a government department can prepare a CKPoM that they claim identifies core koala habitat in accordance with SEPP 44, and then 7 years later the same department starts issuing PVPs and logging approvals over that same core Koala habitat in contravention of SEPP 44 and their own PNF Code of Practice, while claiming the CKPoM they had approved was invalid.

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